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CAPE COAST**

USAID/UCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING SUPPORT PROJECT

YEAR THREE 2ND QUARTER REPORT

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Cover Photo:

Mr. Andrew Karas, out-going USAID Missions Director to Ghana and other USAID officials in a group photograph with the Pro Vice-Chancellor of UCC, Prof. K. T. Oduro and some UCC officials.

Photo credit: Department of Fisheries and Aquatic Sciences – UCC

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EXECUTIVE SUMMARY

The Fisheries and Coastal Management Capacity Building Support Project is a partnership agreement between the United States Agency for International Development (USAID) and the University of Cape Coast (UCC) over five years (2014-2019). This report gives an account of progress made and challenges encountered within the second quarter of the third year. Achievements over the period include the official launch of the Fisheries and Coastal Management online database (FishCoM) intended to harmonise fisheries and coastal management data and information for public access; development of skills of students and faculty of the Department of Fisheries and Aquatic Sciences in proposal writing, grantsmanship and strategic planning was a key feature. The Centre for Coastal Management completed modules and registration of short courses at the Ghana Library Board. The courses include geographic information systems, fisheries management, integrated coastal zone management and climate change adaptation. The project admitted six (6) additional PhD students on partial scholarships, advertised and opened applications for admission of the last batch of MPhil students to receive full-time scholarships for MPhil degree programs. Planning for the visit to the University of Rhode Island led by the new Vice-Chancellor of the University of Cape Coast to strengthen academic ties for faculty exchange and student mobility to train 10 PhD students commenced. Also, processes for the training of academic and technical staff in the operation and safety related to the research boat (RV Sardinella) at the Regional Maritime University was initiated to take place in the 3rd Quarter. The project advanced arrangements with the Fisheries Commission and the Ghana Maritime Authority for the registration and licensing of the boat. Approval processes for the use of unmanned aerial vehicle (drone) by CCM was sought for at the Ghana Civil Aviation Authority. The project advanced arrangements with the Ghana Standards Authority for the installation of laboratory equipment and ISO certification of the fisheries and coastal research laboratory. Some challenges to do with delay in the installation of equipment acquired is noted due to delay in the start of the third year in January 2017 instead of October 2016, and the roll-over of certain activities from the second year to the third year due to administrative bureaucracies and some challenges with coordination of facilitation services. The visit of the outgoing Mission Director Mr. Andrews Karas featured prominently within this quarter by bringing the project to lime light within the Central Region and beyond.

1.0 INTRODUCTION

1.1 Ghana's Marine Fisheries Sector

Ghana's fishing industry comprises resources from marine waters, inland or freshwater bodies and coastal lagoons. Marine fisheries in Ghana are important for employment, income generation, nutrition and food security. The marine fisheries sector contributes about 5% to the country's annual gross domestic product (GDP). The sector indirectly supports the livelihoods of some 2.2 million people representing about 10% of the Ghanaian economically active population. In spite of the economic importance of fisheries, production from marine capture fisheries has been declining since 1999, from almost 420,000 tonnes to 202,000 tonnes in 2014, indicating revenue losses in the sector. The economic benefits from the fisheries have reduced partly due to lack of effective fisheries management.



Figure 1: Fishers at sea in the Central Region of Ghana

Ghana faces increasing challenges of managing its coastal and marine resources, especially marine fish stocks and the overharvesting of other coastal resources. The overexploitation of fish at the small and industrial scales with the use of unorthodox fishing methods, and the pollution of coastal ecosystems, are typical examples of the numerous problems of management concern along the coastal zone. The country finds itself at this point partly because of ineffective monitoring and enforcement of fishing rules and regulations, lack of education, training, research, data gathering and analysis, and low government investments in capacity building for natural resource management. Lack of adequate human resource capacity, good governance and well-functioning regulatory systems impede natural resource management in Ghana.

Ineffective monitoring and enforcement of fishing rules and regulations provides an enabling environment for illegal, unregulated and unreported (IUU) fishing. Moreover, available data suggests that there have been astronomical increases in the number of fishing vessels and fishers as well which are coupled with decreases in fish landings in the last few decades. This is a sign of a fisheries sector that is severely overfished leading to increased levels of poverty particularly in coastal communities. There is an urgent need therefore, for improved fisheries

management which will adequately address the problem of overfishing and ensure the rebuilding of fish stocks. Achieving this goal will contribute immensely towards the Ghana Poverty Reduction Strategy.



Figure 2: Personnel from the Ghana Police Service train on fisheries issues and laws

The USAID/UCC Fisheries and Coastal Management Capacity Building Support Project was conceptualized based on this background. It aims at promoting sustainable marine fisheries management in Ghana through capacity building of students, professionals and fishing communities using effective partnerships across public and private institutions locally and internationally. It is for this reason that the United States Agency for International Development (USAID) committed US\$5.5 million, sub-obligated through a multi-year partnership program with the University of Cape Coast’s Department of Fisheries and Aquatic Sciences as lead implementers over a five-year period (2014-2019) to support capacity building for improved management of Ghana’s marine fisheries. The project contributes to the Government of Ghana’s national fisheries policies and coastal development objectives, and the USAID Feed the Future Initiative.



Figure 3: Artisanal canoe fishers at the shore of the Ghanaian Coast

1.2 Feed-the-Future Initiative of the United States Government

The Feed-the-Future Initiative (FTF) was launched in 2010 by the United States government and the Obama Administration to address global hunger and food insecurity. According to the National Institute of Food and Agriculture, it is "the U.S. government's global food security initiative. In 2009, President Barack Obama committed US\$3.5 billion over a 3-year period to a global initiative with the intent of combating hunger and poverty. In May 2010, the United States Department of State launched and developed the Feed-the-Future Initiative. The Initiative is coordinated primarily by the U.S. Agency for International Development (USAID). According to USAID FTF website, "Recent studies suggest that every 1 percent increase in

agricultural income per capita reduces the number of people living in extreme poverty by between 0.6 and 1.8 percent.” No other investment has that return. FTF is funding initiatives in fisheries and coastal management in view of the fact that the capacity of most developing nations to utilize their coastal and marine resources, while sustainably protecting them from degradation to ensure long-term fish food production is lacking.

1.3 The USAID Fisheries and Coastal Management Capacity Building Support Project

The Fisheries and Coastal Management Capacity Building Support Project operates on a partnership agreement signed on 24th October, 2014 between the United States Agency for International Development (USAID) and the University of Cape Coast (UCC). The project adds value to the work of the Department of Fisheries and Aquatic Sciences (DFAS) of the University in terms of administrative, technical and financial assistance. USAID’s total contribution to this Project is up to the tune of US\$5,500,000, which is sub-obligated on yearly increments to enable DFAS effectively coordinate capacity building at various levels for sustainable marine fisheries management in Ghana over a period of five years (2014-2019). The USAID award represents a strategic investment from the American people for food security in Ghana programmed under the US Government’s Feed the Future Initiative and subject to the terms and conditions of the Agreement signed with the University of Cape Coast (PIL No.: 641-A18-FY14-IL#007).

The US\$ 5.5 million award by USAID to the University of Cape Coast is aimed at contributing towards addressing capacity deficiency in fisheries and coastal management to a large extent. The USAID Fisheries and Coastal Management Project was modelled to respond to the issues raised in a SWOT Analysis at the department of Fisheries and Aquatic Sciences. It aims at resourcing the Department through the provision of technical opportunities and financing to train personnel for the fisheries and coastal management sectors. It also envisions to strengthen the Centre for Coastal Management to be fully operational. It is building stronger and more integrated information support systems to manage and streamline existing and new data on fisheries and coastal issues to underpin future evidence-based policy formulation to help inform development strategy decisions at all levels.

Therefore, the project activities contribute to USAID’s development strategy for Ghana as outlined in its Country Development Cooperation Strategy (CDCS), directly in support of the Development Objective Two: Sustainable and Broadly Shared Economic Growth. It is expected that by the end of the project, capacity building for sustainable marine fisheries management in Ghana can be quantitatively proven and demonstrable management outcomes for the country’s coastal-marine space and resources will be evident.

These achievements will come on the back of a strengthened local scientific capacity in specific areas of emphasis such as the provision of quality and relevant educational programs, practical research, extension and advisory services that will support the management of Ghana’s fisheries and coastal resources to enhance the country’s social and economic development. One of the key objectives to deliver this vision is to build sustainable partnerships with institutions with shared research and training interests by creating a platform for regular interaction and dialogues with local and foreign universities, particularly with Centres, Institutes and Departments at the University of Rhode Island (URI). This project has also enabled targeted collaborations with relevant partners including the Ministry of Fisheries and Aquaculture

Development (MoFAD) and the Fisheries Commission of Ghana, libraries and research institutions with the idea to promote increased use of science and applied research for decision making, law enforcement, climate change adaptation and biodiversity conservation for poverty alleviation.



Figure 4: Final year undergraduate students from DFAS on a field educational trip to a fish farm.

An add-on effect of this project will be the upgrade of skills of academic and technical staff in the use of new technologies and scientific equipment, refurbishment of the fisheries and coastal research laboratory, library and offices of academic staff, acquisition of vehicles for field research, extension and the procurement of equipment for the creation of fisheries and coastal management database working with other international data sources and host centres.

These improvements coupled with the award of student scholarships will facilitate the training of 16 PhD students (i.e. 10 fully funded; 6 with partial funding), 20 masters and 150 undergraduate students. The package also includes financing of short courses on climate change adaptation, fisheries and coastal management as well as geographic information systems for key professionals over the course of five years. These short courses are run under the ambit of the Centre for Coastal Management (CCM) as part of its operationalization.

The project also supports the implementation of future strategic plans for DFAS and CCM, develop business plans for the CCM, enhance roundtable policy dialogues, and undertake critical research with the help of its newly refurbished Fisheries and Coastal Research Laboratory within DFAS.



Figure 5: *Principal Research Assistants of the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project after a Project meeting at the Centre for Coastal Management (CCM).*

In addition, the project will generate research results to fill key knowledge gaps on a needs basis that would help strengthen the further development and implementation of Ghana’s Fisheries and Aquaculture Sector Development Plan. It is expected that implementation issues, such as prioritizing, sequencing, and phasing in of policy reforms will feature prominently; and will embark on community outreach and extension to improve long-term national capacity on fisheries and coastal issues, promote sustainable livelihoods in coastal communities with focus on the green economy with focus on snail and bee keeping; train personnel in relevant government agencies, and strengthen their links to a network of researchers within national and international research organizations.

Through this grant, formal partnerships (Memorandum of Understanding) have been strengthened or established with reputable local and international institutions as follows:

- I. Ministry of Fisheries and Aquaculture Development, and the Fisheries Commission
- II. University of Ghana’s Fisheries and Marine Sciences Department
- III. University of Development Studies, Department of Fisheries and Aquatic Resources
- IV. Council for Scientific and Industrial Research (CSIR)
- V. University of Energy and Natural Resources, Department of Fisheries and Water Resources
- VI. The Environmental Protection Agency of Ghana
- VII. Coastal Resources Center (CRC) - University of Rhode Island, USA
- VIII. Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia; and
- IX. ECOWAS Coastal & Marine Resources Management Centre, University of Ghana



Figure 6: *University of Cape Coast, a sea front University (Photo Credit: CCM)*

The University of Cape Coast (UCC) is located close to the ocean making the Department of Fisheries and Aquatic Sciences (DFAS) one of the leading institutions in the area of Fisheries and Marine Sciences in Ghana. Indeed, the Department since its inception in 2002 has the vision to become unique and an innovative partner in advancing healthy aquatic ecosystems for sustained provision of goods and services, in collaboration with public and private institutions, both local and international. This vision is beginning to see the light of the day through the USAID multi-year funding to the tune of US\$ 5.5 million. Through this grant, the capacity of the Department to deliver this vision is enhanced through the provision of adequate logistics and teaching infrastructure, increasing student numbers largely due to new knowledge about the capacity of the Department, possible job opportunities, enhanced sensitization about the Department and deepening relationships with related institutions. With this project coming on board, a lot of issues have been largely addressed. The USAID funds has enabled the Centre for Coastal Management effectively take off its operations and received formal institutional recognition.



Figure 7: DFAS Laboratory technicians demonstrating the use of a pole seine net for harvesting fish to a group of Fisheries and Aquatic Sciences students during field practical lessons

The Department and the Centre now have a refurbished laboratory with modern laboratory and field equipment which allow hands-on practical training of students. The Department offers undergraduate (BSc) degree in Fisheries and Aquatic Sciences and postgraduate (MPhil and PhD) degrees that expose students to:

- Oceanography and Limnology
- Integrated Coastal Zone Management including Petroleum Ecology and Climate Change Studies
- Aquaculture
- Fisheries Science including fisheries ecology

With the USAID grant, several opportunities exist for DFAS students. For instance:

- Funding for undergraduate project work in the final year is guaranteed under the multi-year USAID/UCC Fisheries and Coastal Management Capacity Building Support Project (2014-2019).
- Students could benefit from the J-TERM Student Exchange Program with the University of Rhode Island in the United States of America.
- Graduate and Post-graduate studies - The Department offers MPhil and PhD programs in the fields of Integrated Coastal Zone Management, Aquaculture, Fisheries Science, and Oceanography and Limnology. These present our undergraduate students with future academic prospects.

Staff and students also benefit from interactive teaching and learning alongside field visits and real-time laboratory exposure for practical experience. It is anticipated that the graduates could

engage in research work in Institutions (including Council for Scientific and Industrial Research-Water Research Institute (CSIR-WRI), Ministries (e.g. Fisheries and Aquaculture Development; Environment, Science and Technology; Agriculture), Environmental sector, Financial institutions, Oil and Gas industry, NGOs (local and international), Managers of Aquaculture Facilities, Navy, Academia, or become Entrepreneurs among others. The Department strives to communicate with its students and stakeholders through staff blogs, Departmental websites and social interactive platforms such as Facebook.

For further information, follow web links below that reports and documents activities on the project:



Figure 7: UCC Webpage, <http://ucc.edu.gh/>

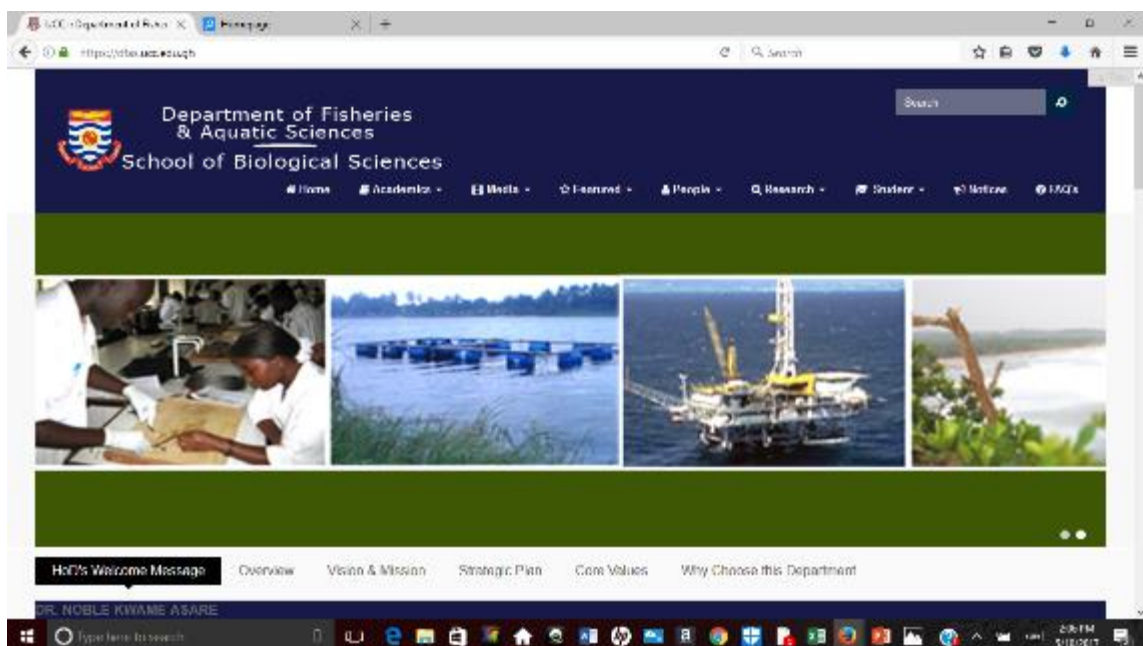


Figure 8: DFAS Webpage, <https://dfas.ucc.edu.gh/>



Figure 9: DFAS Facebook page, <https://www.facebook.com/dfas.ucc.edu.gh/>



Figure 10: CCM web site, <http://ccm.ucc.edu.gh/>

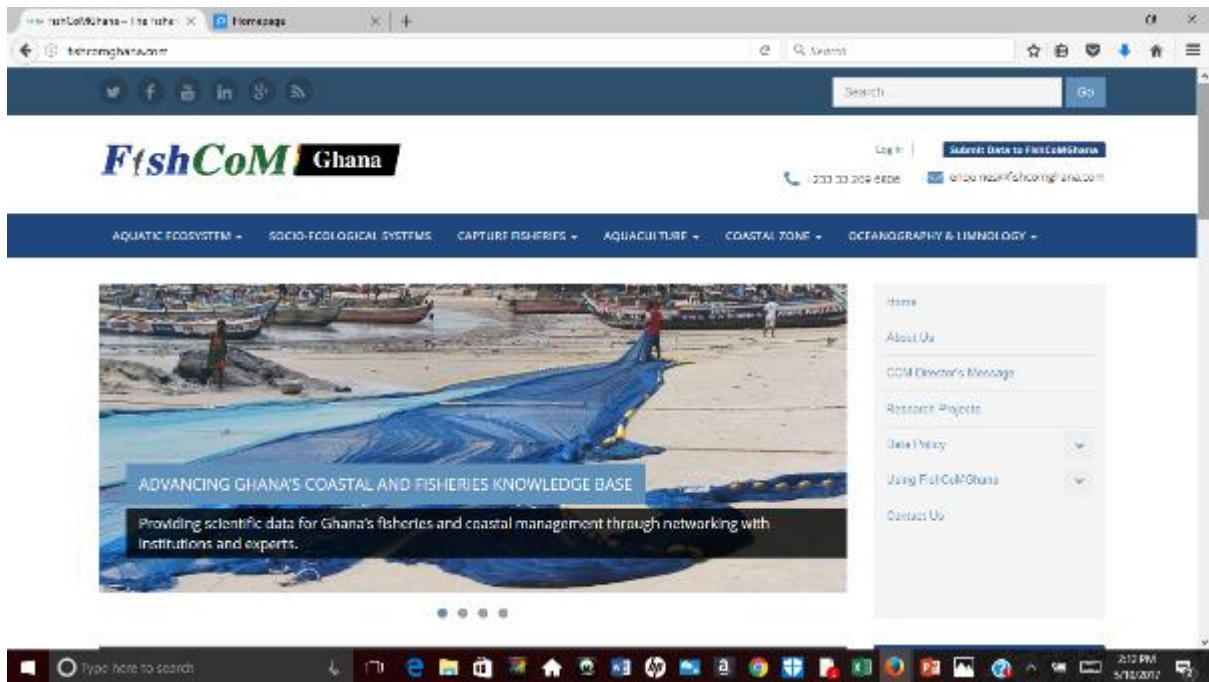


Figure 11: FishCoMGhana website, <http://fishcomghana.com/>

1.5 Monitoring and Evaluation (M&E)

Monitoring and evaluation is an important component of planning and implementation of all activities of the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project. During the quarter under review, the project M&E team monitored all project activities planned for the second quarter and reported on the progress to the Core Management Team on regular basis in order to ensure that activities were implemented according to the timelines specified in the Year 3 workplan. The project developed a comprehensive strategy and approach to the implementation of project activities using the services and technical support of external facilitators, mainly from sister Departments of other universities in Ghana.

The project Year 3 workplan was developed to bring on board external facilitators who will assist the project to carry out activities related to training and capacity building in fisheries management, Geographic Information Systems, Integrated Coastal Management and climate change as well as other activities related to supplementary livelihoods in coastal communities, ecological monitoring of wetlands and biodiversity, research in governance issues in fisheries, and fisheries and coastal research dialogue.

One of the lessons learned from Year 2 was that, there were challenges of ensuring that external facilitators fully complied with and fulfilled their M&E reporting requirements by the project management. To improve on M&E responsibilities and reporting by external facilitators in Year 3, project management organized a workshop for all external project facilitators to brief them about the project M&E system and appropriate monitoring tools and skills for data collection for good reporting. In this workshop, the external facilitators were introduced to the Project's M&E system, project indicators, data collection methods and reporting. The Technical Assistants were reminded of their responsibilities in the timely implementation of their activities and in contributing data to support the M&E systems.



Figure 12: Godfred Asiedu (standing), M&E Support Person for the USAID/UCC Fisheries Project, sensitizes Project external facilitators on their responsibilities and efficient reporting of field activities



Figure 13: Project team in a group photograph with technical facilitators at the M&E Workshop at CCM

Another activity performed in the quarter under review as far as project monitoring and evaluation is concerned was the completion of a survey mounted by USAID/Ghana AfricaLead related to the Results Based Management/ Monitoring and Evaluation Short Course they organized for the project in June 2016. The purpose of the training was to enhance the skills of project M&E staff in a range of topics, more specifically monitoring and evaluation, Results-Based Management and knowledge management (KM) so as to enable participants support the establishment of a monitoring system, process and analysis that would lead to a better design, implementation and tracking of activities. The course objectives were three-fold; (1) to enhance skills and knowledge in Results-Based Management, principles and practice (2) to help operationalize an M&E system to support a Knowledge Management framework using a Results-Based Management approach and (3) To develop a roadmap to implement it.

AfricaLead organized a follow-up survey as part of their regular monitoring and evaluation efforts to assess whether the Results-Based Management / Monitoring and Evaluation Training conducted was relevant and is contributing to improved capacity and performance. This was an opportunity for the M&E team to reflect on the relevance of the training, its applicability and contribution to their work, project outcomes and results. The project M&E team participated in this survey to provide feedback which was also helpful in improving the effectiveness of this training program in the future.

2.0 PROGRAM COMPONENTS, MANAGEMENT AND ACTIVITIES IN THE THIRD QUARTER OF YEAR TWO

2.1 Key Activities Completed in the Second Quarter

- The USAID/Ghana Mission Director visited the project and the Central Region as part of his departure from post program. The Mission Director had a working dinner with selected staff and students of DFAS and CCM, paid courtesy calls on the Central Regional Minister and the Vice-Chancellor of UCC, interacted with staff and students of DFAS and CCM, took a tour round UCC campus and also inspected project facilities including the fisheries and coastal research laboratory.



Figure 14: The USAID/Ghana Mission Director Mr. Andrews Karas visits USAID/UCC Fisheries Project

- During the period under review, the project manager, Dr. Denis Aheto participated in the Feed the Future annual partners meeting with the Ghana Government and stakeholders working to advance food security goals under the U.S. government's global hunger and food security initiative. Participants discussed the progress made over the previous year and plans for improving nutrition and food security in Ghana. Expected Results: Improved partnership between the U.S. and Ghana, and improved food security.



Figure 15: Excerpts from the Feed the Future Partners Meeting in Accra (March 21-22, 2017)

- The project took part in the workshop on the development of a fisheries co-management policy for Ghana organized by the USAID/Ghana Sustainable Fisheries Management Project with inputs from diverse stakeholders.
- The project officially launched the Fisheries and Coastal Management (FishCoM) online database with the signing of MOUs regarding operations of the database with collaborating institutions in Accra.
- The project organized a Proposal Writing workshop for DFAS and sister Departments of the School of Biological Sciences and the College of Agriculture and Natural Science with facilitation by an expert in proposal writing from Belgium.
- The project organized a Strategic Planning workshop for DFAS and CCM with facilitation by an expert in strategic planning from Belgium.
- The project participated in the USAID/Ghana Implementing Partners workshop organized by USAID/Ghana METSS and AfricaLead.
- The project participated in the USAID/Ghana Sustainable Fisheries Management Project Implementing Partners workshop organized by the SFMP at the Elmina Beach Resort.
- The project admitted 6 PhD students on partial scholarships, advertised and opened applications for admission of the last batch of MPhil students to receive full-time scholarships for MPhil degree programs.

- The project participated in the Leadership for Fisheries Management training course organized by the USAID/Ghana Sustainable Fisheries Management Project.
- The project organized two short courses in Geographic Information Systems (GIS) and Fisheries Management.
- The project developed a new strategy for the implementation of Year 3 activities to be carried out by external project facilitators and working contracts were signed for the commencement of activities.
- The project organized a Project Management Board meeting to discuss project Year 3 activities and program approach, Terms of References for external project facilitators and considerations for the award of technical assistantships.
- Project Management initiated processes for the training of DFAS academic staff at the Australian National Centre for Ocean Resources and Security in Australia.
- Project Management initiated processes for the training of DFAS academic and technical staff in the manning of research vessel and safety issues at the Regional Maritime University in Accra.
- The project advanced arrangements with the Ghana Standards Authority for the installation of laboratory equipment and ISO certification of the fisheries and coastal research laboratory.
- The project advanced arrangements with the Fisheries Commission and the Ghana Maritime Authority for the registration and licensing of the project research vessel.
- The project played an active role in the search for a new Chief of Party of the USAID/Ghana Sustainable Fisheries Management Project.

3.0 PROJECT OUTPUT1.1: IMPROVED INFRASTRUCTURE

3.1 Activity 1.1.1: Renovating and Equipping Fisheries and Coastal Research

Laboratory

Physical development works and renovation of the fisheries and coastal research laboratory has long been completed but there is still work to be done regarding the installation of equipment and ISO certification of the laboratory. In efforts to have the equipment installed and the laboratory certified, the Ghana Standards Authority was identified and the project has since engaged the Authority back and forth concerning the needed services to be provided. Project management developed Terms of Reference for required services based on which the Ghana Standards Authority conducted a preliminary assessment, prepared and submitted a financial and technical proposal for consideration by the project covering a sum of one-hundred and forty thousand Ghana Cedis (GHS 140,000.00) as proposed applicable charges. The project is however concerned about the delays in the installation of the equipment for use by students and faculty.



Figure 16: *The main laboratory and research laboratories with installed equipment*

Services to be provided as indicated in the proposal include a gap analysis to determine the current status of the laboratory’s quality system in relation to the relevant requirements of ISO/IEC 17025:2005, the identification of the laboratory’s processes and required resources, the establishment of management structures, procedures and guidelines to address the relevant clauses of the standard, the development of laboratory quality manual, technical manual, quality policy, procedures and guidelines to address the relevant clauses of the standard, provide mentoring support during the development of the designed management system, ensure that the system is developed and matured before external assessment and certification, and the installation of equipment.

Project management conducted an assessment of the services to be provided and the relevant charges and was of the view that the charges were too high and outside what the project had budgeted for, and therefore there was the need to have a discussion with the Ghana Standards Authority to look at the possibility of reducing the charges. The Ghana Standards Authority was contacted in that regard and they requested for the project to formally put their concerns in writing for consideration after which a meeting will be called between the two parties to have a physical interaction to determine the best way forward. Project management is yet to send the letter to the Ghana Standards Authority after which the meeting can take place to discuss how best to approach the matter.

The project plans to convert the shipping containers which were used to transport the laboratory equipment from abroad to the University of Cape Coast as a storage facility for some of the laboratory equipment, office space for DFAS Technicians and GIS hub for the CCM. A piece

of land near the College of Agriculture and Natural Sciences was provided by authorities of the School of Biological Sciences for this purpose. As a university requirement, the project sought approval from the Directorate of Physical Development and Estate Management of UCC for the construction of the facility. Unfortunately, construction work on the facility commenced after clearance by UCC and without formal approval by USAID. USAID policy requires an environmental mitigation and management plan for a construction of that nature but there was no such a plan in place before the commencement of the activity. USAID therefore declared the activity as non-compliant with USAID policy and requested for the activity to come to a halt until an environmental mitigation and management plan has been submitted to USAID, and the project provides documentation that DFAS has been allocated that piece of land by UCC for that purpose, the design of the structure has been approved by the university, and the cost of the construction is within approved budget. DFAS has so far compiled the appropriate documentation (i.e. approval letter from the university, budget, university approved shed construction plans) and is now in the process of preparing the environmental mitigation and management plan to be submitted to USAID for approval.

3.2 Activity 1.1.2: Refurbishing and Equipping office/Lecture/Computer rooms and Library

As part of providing adequate infrastructure as a way of strengthening the capacity of DFAS, eight (8) DFAS academic and technical staff offices were agreed upon to be refurbished under the USAID project. Challenges with UCC procurement, contracting and payment processes caused undue delays in the refurbishment works. Refurbishment work on two (2) of the offices were completed in the first year of the project and three (3) more completed in the second year. After addressing some of the challenges that led to the delays, the contractor developed a new schedule of work which would lead to the completion of work on the rest of the three (3) remaining offices. Work on the three (3) remaining offices started in the last Christmas break which was completed in this reporting quarter. Work has been completed but the contractor is yet to officially hand over to the Directorate of Physical Development and Estate Management of UCC who will in turn hand it over to DFAS after conducting an inspection of the work. The contractors can then receive the last part of payment for their services if the Directorate of Physical Development and Estate Management is fully satisfied with the quality of work. This means that work on all eight (8) offices earmarked for refurbishment by the project has successfully been completed to enhance the work of academic and technical staff of DFAS.

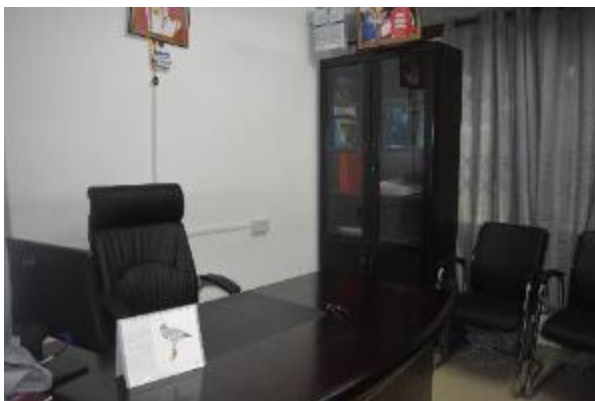




Figure 17: Renovated offices of some DFAS academic staff

One important thing that is still outstanding is the procurement of books and subscription of journals for the DFAS departmental library. Several attempts by project management to work with the University librarian and the Procurement Section of UCC to purchase books and subscribe to journals for the library have not yielded results. In the last quarter, the matter was brought to the attention of the Project Management Board who advised that DFAS or the School of Biological Sciences can go ahead and buy the books in batches by themselves on condition that the amount involved in a single procurement does not go above a certain value approved by UCC, which is in line with University procurement policy. Project management therefore decided to work through the project bankers to acquire a bank card which will be approved by the Director of Finance of UCC for the purchase of the books in batches and to also enable DFAS to subscribe to the journals. The bank card is yet to be issued after which the process can be facilitated.

3.3 Activity 1.1.3: Acquisition of Vehicles to Support Educational, Training, Research and Extension Activities

The project has already secured all three (3) vehicles planned to be bought in course of the five-year life of project. Project management now has a responsibility of making sure that the vehicles are well maintained and regularly serviced to support educational, training, research and extension activities, the purpose for which they were bought. In the last quarter, project vehicles operated without any major challenges with the exception of the Ford truck which was off the road due mainly to a problem with its brakes. The Ford truck therefore had to spend some time at the vehicle maintenance workshop for it to be fixed. This disrupted travel plans of DFAS staff and students but alternative arrangements had to be made by DFAS to assist travellers to have alternative vehicle from the University for official duties and field work. Fortunately, the Ford truck was repaired towards the end of this reporting quarter and the challenge with vehicles for travel has now been resolved.



Figure 18: Ford pickup truck procured for project activities

4.0 PROJECT OUTPUT 1.2 INCREASED TECHNICAL AND SCIENTIFIC KNOWLEDGE

4.1 Activity 1.2.1: Academic and Technical Staff Capacity Strengthening

As part of strengthening the capacity of DFAS and CCM staff throughout the duration of the project, 4 members of academic staff who are more involved in the Integrated Coastal Zone Management aspects of the project will take part in a study tour to the Australian National Centre for Ocean Resources and Security (ANCORS) at the University of Wollongong, Australia in June/July this year. While at ANCORS, the participants of the study tour will receive education and training on law of the sea, maritime regulation and enforcement, maritime security, marine fisheries management and also receive marine policy development advice. The participants will learn from taking part in ANCORS short courses and will use the experience gained to improve on the short courses that are run by the CCM upon return. Participants will also learn about how ANCORS operates in terms of their strategy for managing short courses, their overall management and administrative structure, funding and income generation mechanisms. Planning for this exercise was initiated in the last quarter and continued through the quarter under review. After several discussions, management of ANCORS agreed to offer a fee reduction for the study tour due to the special relationship that DFAS has with ANCORS. This will therefore provide some flexibility with project budget to cover travel, per diem and lodging for all the 4 participants. Currently, ANCORS has been contacted to send an invoice for the payment of course fees and also invitation letters to facilitate the application of visas for travel to Australia. Whilst waiting for the invoice for payment of course fees and the invitation letters, internal arrangements are also being made for UCC administrative support, flight bookings and any other training and travel requirements.

In the quarter under review, DFAS finalized arrangements with the Regional Maritime University (RMU) in Accra to organize specific short courses for academic and technical staff of DFAS concerning how to properly and safely man, operate and maintain the projects research boat, the *RV Sadinella*. The Regional Maritime University is expected to enroll and train two (2) technical staff and one (1) academic staff of DFAS in five (5) specific courses; Elementary First Aid, Personal Survival Techniques, Personal Safety & Social Responsibility, Life Boat and Steering (Simulator). This activity is scheduled to occur in the next quarter and it is important that such a training is conducted as it is directly linked to the registration and licensing of the research boat by the Ghana Maritime Authority and the Fisheries Commission. The Ghana Maritime Authority and the Fisheries Commission require that qualified and

certified personnel by a competent Authority, who are able to properly and safely man, operate and maintain a vessel are in place before a vessel could be registered and licensed. The project research vessel has not been licensed to date and hence cannot be used for the purpose of research because of the lack of qualified and certified personnel. This activity will therefore facilitate the process of registering and licensing the vessel for sea worthy.



Figure 19: DFAS Research Vessel embossed with the name RV Sardinella

4.2 Activity 1.2.2: Operationalization of the Centre for Coastal Management

The Centre for Coastal Management (CCM) is progressively gaining roots following the appointment of a substantive Director by the University to steer the Centre's affairs. The Director is expected to lead an innovative and strategic development of the Centre. More improvements have taken place towards operationalization of the Centre with respect to organization and the implementation of the Centre's core mandates. Unfortunately the recruitment of more members of staff at different levels to support the Director in performing relevant functions is a limiting factor. Part of the problem is government's freeze on employment and the limited resource capacity to the Centre to engage staff on project basis or fixed-term contracts. Regardless the limitations, the Centre played its role very well to ensure that project activities are implemented in an effective and timely manner to achieve intended outcomes with the support of external facilitators and research assistants on the project.

As part of activities to operationalize the Centre for Coastal Management, CCM also invited an expert in project proposal writing and institutional strategic planning over a two-week period during this reporting quarter to build the capacity of DFAS and CCM staff in proposal writing, project management and to assist DFAS and the CCM to develop long-term strategic plans and the identification of funding sources. It is anticipated that this program will position DFAS and CCM to coordinate funding and engage in effective resource mobilization (such as infrastructure, logistics, and personnel) to access grants nationally and internationally. As part of the workshop, the proposal writing expert assisted DFAS staff to review the Department's

existing strategic plan and draft a new plan for the next five years (2017 – 2022) and to train the DFAS faculty and staff of CCM on grantsmanship and project management. He also assisted them to revise a previously submitted but unsuccessful European Union Intra Africa Mobility proposal based on comments received from the donors for a possible resubmission, and also did a virtual proposal development exercise as part of the capacity building exercise. Seventeen (17) and fifteen (15) members of DFAS staff and students respectively participated in the strategic planning and the proposal drafting workshop respectively.



Figure 20: DFAS holds strategic planning workshop

In the strategic planning sessions, more emphasis was laid on the existing DFAS strategic plan 2012 - 2017, but also concentrated on the necessary steps required to build foundations that serve as a basis to populate the several parts of the strategic plan as well as a structure for the implementation of the plan itself. In the proposal writing sessions, the requirements of the 2017 Call were critically analysed and compared with the 2016 Call so as to improve the contents of the 2016 application, to assure the quality and completeness of information provided, to focus on the uniqueness of the proposal and its partnership, and to produce a logical structure of the project for its implementation. The expectations of participants to understand the steps needed to draft a strategic plan and proposal and to have the structure of these documents ready by the end of each workshop week was successfully met.



Figure 21: Proposal writing workshop for CCM

The workshops could be described as information collection workshops and not really writing the strategic plan for DFAS or writing a proposal. This was because the correct understanding of the strategic planning and proposal development processes were required before drafting of these documents can start. Project management is hopeful that with the knowledge gained from the workshops, drafting teams would be able to finalise the DFAS strategic plan and also to be able to write proposals with enough quality.

4.3 Activity 1.2.3: Support for Postgraduate (MPhil & PhD) Training Program

At the beginning of the project, five (5) PhD and 10 MPhil students were admitted in the 2015/2016 academic year while 5 PhD and 5 MPhil students were admitted in the 2016/2017 academic year through a competitive selection process. The last batch of 5 MPhil students will be admitted beginning 2017/2018 academic year in order to complete their course in time before end of project in September 2019. In the last quarter, scholarship advertisements went out in the media to seek applications from eligible applicants to fill the last batch of 5 MPhil student positions. Several applications have been received awaiting selection and shortlisting after which successful candidates will be invited for interview to justify their inclusion. This will be done in the next quarter. The 6 additional PhD students who were admitted on part scholarships finalized all needed requirements in the last quarter and are now full time student of the university. These students have been assigned with Academic Advisors, have developed and submitted their research proposals and are currently fully engaged with their studies.

Table 1: Six additional PhD candidates admitted on partial scholarship under the Project

Name	PhD Programme	Supervisor
Elizabeth Effah	Integrated Coastal Zone Management	Dr. Denis Aheto <i>Dr. Emmanuel Acheampong</i>
Sheila Fynn-Korsa	Fisheries Science	Prof. Joseph Aggrey-Fynn <i>Dr. Isaac Okyere</i>
Alberta Jonah	Integrated Coastal Zone Management	Dr. Denis Aheto <i>Dr. Isaac Okyere</i>
Ramat Quairane Duker	Oceanography and Limnology	Dr. Noble Asare <i>Prof. Edward Obodai</i>
Isaac Kofi Osei	Fisheries Science	Prof. Kobina Yankson <i>Prof. Edward Obodai</i>
Ebenezer Delali Kpelli	Integrated Coastal Zone Management	Prof. Joseph Aggrey-Fynn <i>Prof. John Blay</i>



Figure 22: USAID Missions Director to Ghana, Mr. Andrews Karas (right), and Mr. Justice Odoi, USAID Ghana Environmental Specialist interact with a PhD Oceanography and Limnology student at DFAS

Plans to have fully funded PhD students travel abroad to the University of Rhode Island (URI) in the US to conduct part of their studies progressed steadily in the last quarter. The first batch of 5 PhD students have been programmed to enrol in a 6-month (1 semester) research program at URI beginning August this year. The possibility of PhD students undertaking dual degree programs was discussed between the leadership of URI and UCC when delegates from the College of Environment and Life Sciences of URI paid a working visit to the UCC. A delegation from UCC are currently in the US to finalize arrangements on the study abroad program and also continue discussions on the possibility of dual degree programs for students.

This visit will progress negotiations for further collaboration and exchange of faculty and students. Work progress of postgraduate students to date is shown in Table 1.

Table 2: Work progress of postgraduate students to date

Name of student	Research topic	Progress to date
Frederick Ekow Jonah (Oceanography and Limnology)	Assessing the dynamics of nutrients within some selected coastal ecosystems in Ghana	<ul style="list-style-type: none"> • Research proposal presented • Coursework undertaken • Field protocols tested • Laboratory analysis conducted
Miriam Yayra Ameworwor (Fisheries Sciences)	Observations on the bottom set gillnet fishery in the Central Region of Ghana	<ul style="list-style-type: none"> • Research proposal presented • Study sites scouted • 2 months of field sampling conducted • Laboratory analysis conducted • Interviews with fishers conducted
Lesley Ntim (Integrated Coastal Zone Management)	Value Chain Analysis of Croakers (<i>Pseudotolithus</i> species) in Ghanaian Fishery	<ul style="list-style-type: none"> • Research proposal presented • Reconnaissance survey of sampling sites conducted • Literature review ongoing • Relevant courses enrolled
Rhoda Lims Sakyi (Aquaculture)	Molecular diagnosis of fish diseases in Ghana	<ul style="list-style-type: none"> • Visits to selected aquaculture farms undertaken • Questionnaires administered • Fish and water samples collected for analysis • Courses in molecular biology ongoing
Jemimah Etornam Kassah (Fisheries Science)	Assessment of the fishery and nutrient value of Atlantic chub mackerel (<i>Scomber colias</i> Gmelin, 1789) in Ghana	<ul style="list-style-type: none"> • Field sampling conducted • Fish species have been identified • Growth and mortality parameters of fish estimated

		<ul style="list-style-type: none"> • Stomach content analysis of fish conducted
Isaac Kofi Osei (Fisheries Science)	A study on the fishery, aspects of the biology and culture of <i>Crassostrea tulipa</i> population at Densu Estuary, Ghana	<ul style="list-style-type: none"> • Research proposal presented • Data collection to start in May 2017 • Literature review conducted
Alberta Jonah (Integrated Coastal Zone Management)	Assessing the ecological, spatio-temporal and socio-economic dimensions of ecosystems towards the designation of a Marine Protected Area: case study of the wider Cape-Three Points in the Western Region of Ghana	<ul style="list-style-type: none"> • Research proposal developed • Reconnaissance visit to study sites conducted • Training courses undertaken
Michelle Naa Kordei Clottey	Assessment of the seabream (<i>Sparidae</i>) fisheries from Ghanaian waters	<ul style="list-style-type: none"> • Data collected for 15 months • Fish samples have been sampled and investigated • Growth and mortality parameters of fish determined
Lawrence Armah Ahia (Aquaculture)	Cross breeding of some selected populations of black-chinned tilapia (<i>Sarotherodon melanotheron</i>) in Ghana	<ul style="list-style-type: none"> • More hapas for fish breeding installed • Data collection and preliminary data analysis conducted • Supervisors conducted field visit to study sites
Rahmat Duker Quaigrane	Distribution and ecotoxicological effects of polycyclic aromatic hydrocarbons (PAHs) in some lagoons in Ghana	<ul style="list-style-type: none"> • Research proposal developed • Presentation on research proposal conducted

4.4 Activity 1.2.4: Undergraduate Research Grants

To ensure that all spectrum of students benefit from project interventions, the project provides small grants to final year undergraduate students of DFAS to assist them financially to carry our field research for their dissertation. During the implementation of this intervention, project management noticed that the amounts budgeted for to support final year undergraduate research was underspent as a result of fewer number of DFAS undergraduate student who make it to the final year. Project management took a decision therefore to apply part of that budget to fund final year undergraduate students from the Departments of Fisheries of other sister Universities in Ghana that the project collaborates with in the implementation of project activities on competitive basis.



Figure 23: Some DFAS final year undergraduate students whose research is being funded by the Project

This was perceived as a way of further strengthening the level of collaboration that the project has with these universities. In the last quarter, a total of 20 field research grants (5 per institution) worth US\$500 per student was awarded to students from 4 public Universities in addition to 9 current undergraduate students of DFAS to support their final year small research projects. Prior to the disbursement of the funds, a Memorandum of Understanding (MoU) that covers terms and conditions of the support was developed and signed between DFAS and the other sister Universities with the purpose of strengthening the existing degree of collaboration between DFAS and the sister Universities. Project management is hopeful that student beneficiaries of the program will work hard to make the program a success. Progress will be closely monitored and reported in the coming quarter.

5.0 PROJECT OUTPUT 2.1: INCREASED MARINE AND COASTAL RESEARCH AND RESOURCE ASSESSMENTS

5.1 Activity 2.1.1: Conducting Fisheries Stock Assessment

Current data and information on the status of exploited fish stocks generated through fish stock assessment research is critical to addressing the challenge of declining fish catches in Ghana, the long-term conservation and sustainability of important fish stocks. The project's activity on conducting fish stock assessment has the specific objective of providing data and

information on some selected commercially important marine fish stocks in Ghanaian coastal waters to support efforts towards achieving the sustainability and conservation of the stocks.

Fish stock assessment was conducted for a few months only in the past year resulting in the lack of adequate data to predict the actual status of fish stocks in Ghanaian waters.

To obtain more reliable data and information to determine the status of fish stocks, an all-year round sampling is required. This informed the decision by project management to approve a request from the project fish stock assessment facilitator to undertake the research for an additional period. Upon granting of the request, the research was continued throughout the first quarter and ended in the quarter under review. Monthly length-frequency data was compiled after the end of the survey in the last quarter to estimate growth and mortality parameters and the estimation of Maximum Sustainable Yield (MSY).

Sample-based fishery surveys aimed at gathering monthly data on the landings (kg) of and species abundance from canoes at Half Assini, Elmina, Tema, and Keta, semi-industrial boats from Sekondi, Elmina, Apam and Tema as well as industrial vessels from Sekondi and Tema were conducted. The status of selected commercially important marine fish stocks in Ghana was progressively monitored and compared with previous records, growth and mortality parameters as well as the exploitation levels of the selected fish stocks were determined, different measures of effort in the fisheries were identified, and the most reliable catch per unit efforts for the fisheries determined. Results obtained from the survey indicated decline in the catches of targeted fish stocks and that is mainly attributed to increased fishing effort. The sizes of most of the targeted species landed fall below the minimum permissible landing sizes of commercially important fish species specified in section 139 (1) of the Fisheries Act 625 of 2002. This supports the adoption of closed seasons as urgent management measure to conserve the stocks.

5.2 Activity 2.1.2: Conducting Research and Assessment on Marine Fisheries

Governance Issues

There are about 189 fish landing sites in the Western and Central Regions, 93 in the Western and 96 in the Central Region. As at the end of the first quarter of FY 2017, research and assessment on marine fisheries governance issues had been conducted in 60 landing sites belonging to 7 coastal Districts in Western and Central regions. It was concluded after the research that there is a huge disconnect between the local government administration and traditional fisheries authorities, as by-laws are either not applied or enforced to regulate fishing activities at the community level. There was the need to extend the exercise to cover all the remaining landing sites in the Central and Western Regions which informed the decision by project management to engage the services of a fisheries governance expert in Year 3 to continue with this research. Research and assessment on marine fisheries governance issues in Year 3 started in this reporting quarter and the following represent what have been achieved so far.

- Research on fisheries governance issues within nine (9) landing beaches in the Mfantseman District of the Central Region was conducted
- A policy paper on Sustained Research for Policy and Governance Dialogue on Marine Fisheries and Coastal Management in Ghana was developed
- Two meetings with the National Development Planning Commission (NDPC) were held to discuss results of previous fisheries governance and policy development

research as a potential input into the Ghana 4-year Medium Term Development Plan (MTDP) and also to make a presentation on the topic; fisheries and environmental sanitation; the role of Metropolitan, Municipal and District Assemblies (MMDAs)

- A working paper on Marine Fisheries and Environmental Issues for Medium Term Development Plan for Ghana was submitted to the NDPC for review at a stakeholder forum for MMDAs for possible capture in the next 4-year MTDP
- A meeting was organized with the Central Regional Minister and the USAID/Ghana Mission Director to discuss fisheries and coastal management policy issues
- A meeting was held with the Minister for Fisheries and Aquaculture Development (MoFAD) to introduce the project and discuss possible areas for strengthening the existing collaboration with the ministry.



Figure 24: Meeting of Dr. Denis Aheto, Project Manager (Extreme right) and Project Facilitators Dr. Benjamin Champion (extreme left) and Dr. George Darpaah with the newly appointed Minister of Fisheries and Aquaculture Development, Honourable Mrs. Elizabeth Naa Afoley Quaye

- A meeting was held with the Ministry for Sanitation and Water Resources to discuss how information generated by the project could be of use to policy formulation by the Ministry.
- A training session for a more effective reportage on fisheries and coastal environmental issues by journalists has been planned in the next quarter

5.3 Activity 2.1.3: Research on Fish and Shellfish of Commercial Value

As marine fish production continues to decline, aquaculture is currently being promoted in Ghana as one of the ways of addressing this challenge. However, there is inadequate scientific knowledge on the biology and culture potential of many fish species, which is also a challenge that must be addressed if aquaculture is to be promoted as a viable business. Through this activity therefore, the project is carrying out scientific studies on the biology and culture of brackish water fish resources, mainly tilapia and oysters to generate data and information needed to increase fish production from aquaculture.

There is a research being undertaken by a second year PhD candidate to investigate the potential of selective breeding in the propagation of the most common coastal species of tilapia, blackchin tilapia. This will promote the use of the species on fish farms, especially in coastal Ghana, by improving culture performance.



Figure 25: Hapa-in-pond setup for the research of Lawrence Ahia, a PhD student in Aquaculture on selective breeding of blackchin tilapia (*Sarotherodon melanotheron*)

One MPhil Aquaculture student supported by the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project at DFAS recently completed his research on the use of locally available natural ingredients for the formulation of tilapia feed, which will contribute to existing knowledge on tilapia aquaculture in Ghana.



Figure 26: Tilapia feed preparation: pelleting (left) and drying (right), by DFAS MPhil Aquaculture student

One of the 6 additional PhD students who started their course in the last quarter has developed a research proposal to conduct scientific studies into the culture of oysters. He has been given the approval to work on the topic; a study on the fishery, aspects of the biology and culture of the mangrove oyster *Crassostrea tulipa* population at Densu Estuary in Ghana which is to be supervised by senior academic advisors at DFAS who are experts in the field. To facilitate the research, a community entry strategy was employed by paying an initial visit to the communities near the Densu Estuary. The PhD student, his supervisor and an MPhil Aquaculture student who also plans to research on oysters, payed a courtesy call on community leaders to declare their intent and seek their consent. They also had a brief discussion with the oyster fishers association within the communities. Findings from research of this kind will inform the decision by project management to promote the aquaculture of finfish and shellfish species as an additional supplementary livelihood activity in coastal communities. If successful, this will contribute significantly to reducing effort on capture fisheries and promote responsible fishing.



Figure 27: DFAS visits led by Prof. Kobina Yankson to communities near the Densu Estuary as part of a community entry strategy to facilitate research of postgraduate aquaculture students

5.4 Activity 2.1.4: Analysis of Value Chains of Fish Trade

Analysis of value chains of fish trade is a project research activity which is currently taken up by a female PhD student. She has developed a research proposal on the study which has been approved by academic supervisors and has also given a presentation on the proposal to a wider DFAS audience. The title of her PhD research proposal is “Value chain analysis of *Pseudotolithus species* towards food security in Ghana”. She proposes that *Pseudotolithus species* is known to be commercially important throughout the Atlantic coast of West Africa. Research has been conducted on aspects of the biology and ecology of this fish, such as the length-weight analysis, studies on food preference and food habits, but very little is known about the commercial status of this important fish, including its value chain. It is against this background that she intends to research on the value chain of the species towards food security in Ghana. Her research focuses on the economics and management of the fishery for this fish. Data and information that will be generated by her research will serve as a baseline for management decision making. The study is expected to produce data on the value chain analysis of *Pseudotolithus species* which will provide information with regards to the factors that go into production, processing, marketing, export and consumption. Profit margins and revenue generated from its export will be determined. The study will address challenges along each step of the value chain. This research has the potential to generate useful information and knowledge on value chains of fish trade and is therefore keenly monitored by the project.

5.5 Activity 2.1.5: Monitor the Biodiversity and Health of Coastal Ecosystems

The conservation and sustainable management of biodiversity need to be promoted. The project intends to contribute to this cause through this activity by monitoring the biodiversity and health of a lagoon and wetland area at Half Assini in the Western Region. This will serve as a demonstration for the conservation and sustainable management of other lagoons and wetland areas in Ghana. Continuous monitoring of the biodiversity and health of such ecosystems requires the generation of baseline data and information against which future changes will be gauged. Since project Year 2, the project has collaborated with researchers from the KNUST Institute of Renewable Natural Resources to conduct research to provide baseline scientific information for assessing the status of the lagoon and wetland area at Half Assini. This resulted in collaboration with the Jomoro District Assembly and other stakeholders in advocating for bye-laws on the sustainable use of the lagoon and the wetland area. This work is to be continued in Year 3 to include periodic assessment of the fish population, benthic invertebrates, and mangrove communities to gather all year-round baseline scientific information for future monitoring. Aquatic environmental conditions will also be investigated.

Preparations for this activity started in the quarter under review where a working contract with specific Terms of Reference was signed with the KNUST Institute of Renewable Natural Resources. The team will carry out a one-year monitoring of aquatic environmental parameters, collaborate with the CCM and the local community, traditional authorities and the Environmental Health Unit of the Jomoro District Assembly to develop bye-laws to protect the lagoon, to remove solid wastes in and around the lagoon, to create a buffer zone of about 5-10m around the lagoon, and to dialogue with the community on the location of sanitary sites. This will ensure that the lagoon is kept in a healthy state for it to provide the ecological and socio-economic services to the.

5.6 Activity 2.1.6: Developing Marine and Coastal Fisheries Database

The first phase of developing the marine and coastal fisheries database, the data management platform on Ghana's aquatic living resources and coastal management (FishCoMGhana), is complete. The database is now online and tracking indicates that it is attracting a lot of visits. A team has been put in place to manage activities related to the publication of new research data on the site which include reviewing all items to ensure accuracy before they are published on the site, provide updates for the contents of all the menu items on the site, and manage inquiries/communications from users of the site. The team is the body authorized to access the secured back-end of the database and oversee its day-to-day operations. For security and quality assurance reasons, members of the team include academic staff members of DFAS and CCM as well as persons with knowledge on the nature of the database. A workshop was organized for the team to learn the process of security clearance for the administration of FishCoMGhana. The database management team was also equipped with the needed skills to enable them manage aspects of the database involving the publication of new research data, key menu updates, and how they can track the use of the site by visitors and respond to inquiries/email communications regarding the use of the online database.

During this reporting period, the project organized a workshop at the University of Ghana in Accra to bring all collaborating institutions and other stakeholders together to officially launch FishCoMGhana. The purpose for organizing the workshop was to bring together potential collaborators for a national dialogue on sharing of scientific data and information and to develop modalities for the sharing of information as well as issues to deal with access to the database.



Figure 28: Launch of the Fisheries and Coastal Management (FishCoM Ghana) Database with attendance by the leadership of the University of Cape Coast led by the Pro Vice-Chancellor, Prof. George Oduro

The occasion was also used by the collaborating partners to sign a Memorandum of Understanding (MoU) regarding the operation of the database. Representatives from the following institutions were present in the workshop:

- Environmental Protection Agency of Ghana
- Ministry of Fisheries and Aquaculture Development & Fisheries Commission
- University of Energy and Natural Resources
- University of Ghana
- Kwame Nkrumah University of Science and Technology
- University for Development Studies
- Council for Scientific and Industrial Research
- University of Rhode Island
- United States Agency for International Development and
- Civil Society Representatives



Figure 29: Head of Department of DFAS Dr. Noble Asare signs MoUs with partners to enable sharing of information on FishCoM Ghana database (left); Dr. Brian Crawford (extreme right), of SFMP, donates some aquaculture books to DFAS at the launch of FishCoM Ghana Project and received on behalf of DFAS by Dr. Denis Aheto).

The Pro-Vice Chancellor of the University of Cape Coast gave a speech on behalf of the Vice-Chancellor who could not attend the event due to other equally important schedules by first welcoming all participants for making time to be present at the launching ceremony. He described FishComGhana initiative as a national but global platform where all people present are key players. He made an emphasis on the fact that fish and other resources from water bodies around the globe have been depleted, hence the need to plan strategically, provide scientific evidence, advocate and participate in the execution of the plan to ensure food security.



Figure 30: Some participants making contributions at the launch of the FishCoM database [Prof. Kobina Yanksson (extreme left) and Prof. Joseph Aggrey-Fynn (middle) and an official from the Ghana News Agency (right)].

He concluded by saying that the launching of FishCoMGhana will therefore provide the impetus to achieve the viable objectives being envisaged. USAID/Ghana was of the view that through the FishCoMGhana initiative, challenges with the management of Ghana's fisheries and coastal resources will be addressed, and that the database will provide researchers, students and other stakeholders with credible data to protect and sustainably manage Ghana's marine and coastal assets. The database will also help to tackle some globally important issues like the impacts of climate change.

USAID/Ghana therefore urged all collaborating institutions to work together towards improving the management and governance of marine fisheries and other coastal resources. The Minister for Fisheries and Aquaculture Development thanked USAID/Ghana and the people of the United States for their generous support towards the development of science in Ghana and for supporting the Fisheries and Coastal Management Capacity Building Project. The Minister acknowledged the fact that in certain circumstances, research data may be hidden, expensive to obtain, or difficult to interpret to advance the cause of development and therefore the FishComGhana initiative is an important one. She was of the view that the initiative will offer an efficient and easy access to data for decision-making and it will serve as a platform where competitive and intellectual battle can take place to promote the understanding on Ghana's fisheries and other aquatic living resources to ensure their sustainable exploitation.

6.0 PROJECT OUTPUT 2.2: COMMUNICATION, EXTENSION AND OUTREACH IMPROVED

6.1 Activity 2.2.1: Developing Material and Conducting Training on Integrated Coastal Management

Before the end of project Year 2, the project developed a training curriculum and training manual on Integrated Coastal Management (ICM) which were tested in a 5-day training workshop using a group of selected participants. An ICM training manual with PowerPoint

presentations, videos of interactions of the coastal zone and human activities and other materials including an instructor guide were developed for the testing. A training program targeted towards stakeholders mainly at the national level is planned for the next quarter using the training materials developed in the Year 2. A facilitator who will play a leading role in the organization of the training program has been identified with planning far advanced for the training to take place from 22nd to 26th May, 2016. This training program will contribute to building the needed human resource capacity required for the sustainable management of Ghana's coastal ecosystems and resources.

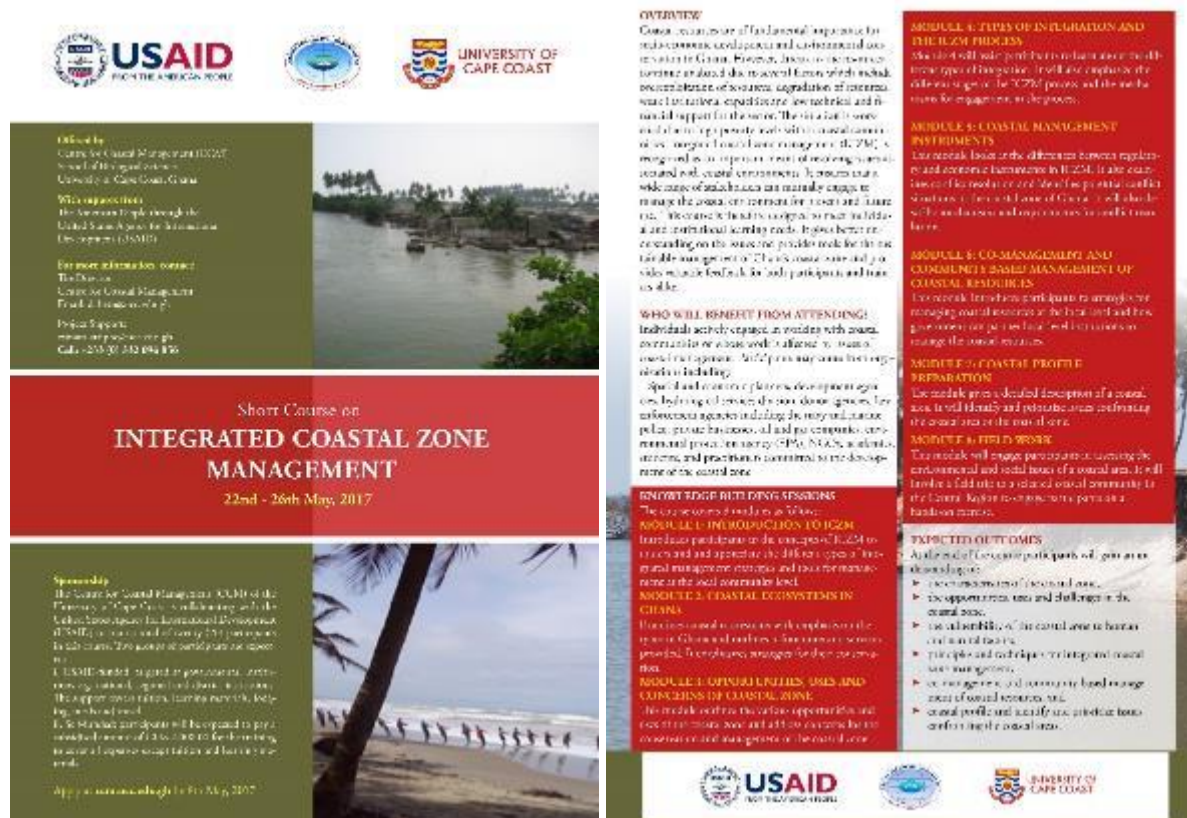


Figure 31: Flyer developed for the ICZM Short Course, 2017

6.2 Activity 2.2.2: Developing Material and Conducting Training on Fisheries Management

As a way of project's contribution to the required technical, management and other resource capacity needs for fisheries management in Ghana, the project in collaboration and partnerships with other relevant governmental institutions and key fisheries experts from the sister universities in Ghana also develop a training curriculum, modules and a training manual on fisheries management for short training courses and tested it in Year 2 using targeted participants and planned to run the main training in Year 3 which took place in the quarter under review, taking into account contributions received from the test training and inputs from DFAS academic staff. The course comprises of 5 modules which are Module 1: Importance of fish to man, state of world and Ghana's fisheries, impacts of fishing on aquatic ecosystems and man, fish and aquatic resources of Ghana; Module 2: Fisheries management: the need, processes and data requirements; Module 3: Scope and approaches of fisheries

management; Module 4: Fisheries management planning, fisheries regulations and institutions; and Module 5: Strategies for fisheries management. A total of eleven (11) participants took part in the fisheries management training course, seven (7) males and four (4) females. It is expected that participants will share the knowledge gained from participating in the training course with their colleagues in their respective institutions and also apply the skills in their normal day-to-day operations.



Figure 32: Participants and facilitators at the Fisheries Management Short Course, CCM

6.3 Activity 2.2.3: Developing Manuals and Updating Training Materials on Climate Change Adaptation and Mitigation

Similar to the other short courses run by the Centre for Coastal Management and DFAS, development of manuals and other training materials on the short course on Climate Change Adaptation and Mitigation is complete which saw the running of a full in Year 2. The course was offered by DFAS/CCM in collaboration with a facilitator from the Kwame Nkrumah University of Science and Technology with people from relevant agencies whose work are related to coastal management and related climate change issues in Ghana as participants. A similar training program is planned to take place in the coming quarter from 29th May to 2nd June, which will be reported as part of activities to be carried out in the next quarter. A training facilitator has been identified with planning far advanced for the training to take place.

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UNIVERSITY OF CAPE COAST

Coled by:
Coastal Commission, University of Cape Coast, and the District Assemblies in the Western Region.

With support from:
The American People through the United States Agency for International Development (USAID).

For more information, contact:
The Executive Director, Coastal Commission
Email: ccm@ccm.gov.gh
Cell: +233 30 33 068 855

**Short Course on
CLIMATE CHANGE ADAPTATION AND
MITIGATION IN COASTAL AREAS**

29th May - 2nd June, 2017

Sponsorship:
The course is jointly sponsored by USAID, the University of Cape Coast, in collaboration with the District Assemblies in the Western Region and the Coastal Commission. The course is free-of-charge for participants.

Learning Outcomes:
1. Understand the concept of climate change and its impact on coastal areas.
2. Identify the various climate change adaptation and mitigation strategies available to coastal communities.
3. Assess the vulnerability of coastal communities to climate change and develop adaptation and mitigation strategies.

UNIT 1: INTRODUCTION TO CLIMATE CHANGE
This unit will provide an overview of climate change, its causes, and its impacts on coastal areas. It will also discuss the role of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.

UNIT 2: INTRODUCTION TO THE SCIENCE OF CLIMATE CHANGE
This unit will provide an overview of the science of climate change, including the greenhouse effect, the role of greenhouse gases, and the impact of human activities on climate change.

UNIT 3: CLIMATE CHANGE IMPACTS, ADAPTATION AND MITIGATION
This unit will discuss the various impacts of climate change on coastal areas, including sea level rise, coastal erosion, and saltwater intrusion. It will also discuss various adaptation and mitigation strategies available to coastal communities.

UNIT 4: COMMUNICATION OF CLIMATE CHANGE ISSUES
This unit will discuss the importance of communication in climate change adaptation and mitigation. It will discuss various communication strategies and tools available to coastal communities.

UNIT 5: FIELD ACTIVITY ON CLIMATE CHANGE VULNERABILITY ASSESSMENT
This unit will provide a hands-on experience for participants in conducting a climate change vulnerability assessment (CCA) in a coastal community. It will discuss the various steps involved in a CCA and the importance of community participation.

LEARNING OUTCOMES:
After the course, participants will be able to:
1. Understand the science of climate change and the role of human activities.
2. Identify the various impacts of climate change on coastal areas and the role of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.
3. Assess the vulnerability of coastal communities to climate change and develop adaptation and mitigation strategies.
4. Communicate climate change issues to the community and other stakeholders.

KNOWLEDGE BUILDING SESSIONS
The course will include the following sessions:
1. Introduction to Climate Change
2. Introduction to the Science of Climate Change
3. Climate Change Impacts, Adaptation and Mitigation
4. Communication of Climate Change Issues
5. Field Activity on Climate Change Vulnerability Assessment

UNIT 1: INTRODUCTION TO COASTAL ECOSYSTEMS
This unit will provide an overview of coastal ecosystems, including mangroves, coral reefs, and seagrass beds. It will discuss the importance of these ecosystems for coastal protection and the role of human activities in their degradation.

UNIT 2: INTRODUCTION TO THE SCIENCE OF CLIMATE CHANGE
This unit will provide an overview of the science of climate change, including the greenhouse effect, the role of greenhouse gases, and the impact of human activities on climate change.

Figure 33: Flyer developed for the Climate Change Short Course at CCM

6.4 Activity 2.2.4: Developing Material and Conducting Training on the use and Application of Geographical Information Systems (GIS)

The capacity of DFAS/CCM staff and students as well as collaborating partners to apply GIS tools in fisheries and coastal management is inadequate. The project has therefore developed 2 training courses (introductory and intermediate) GIS with the support of an external expert in collaboration with other institutions to support the GIS capacity needs. In the quarter under review, the GIS Introductory course slated for Year 3 took place with a total of thirteen (13) training participants, eight (8) males and five (5) females representing UCC, the Fisheries Commission and the District Assemblies in the Central and Western Regions.



Figure 34: Participants at the Introductory GIS Short Course at CCM

The purpose of the short course on GIS was to strengthen the capacity of natural resource managers and development planning officers in decision support systems to sustainably manage and utilize fisheries and coastal resources in Ghana. The course focused on strengthening spatial analysis capabilities and empowered participants to assume responsibility for designing, managing and sustaining development in coastal Ghana using GIS. It also focused on strengthening the geographic information system capabilities of DFAS and the Centre for Coastal Management within the University of Cape Coast to provide effective research and extension services. The Intermediate GIS training course will be organized in the next quarter and will be included in the reporting for that quarter.

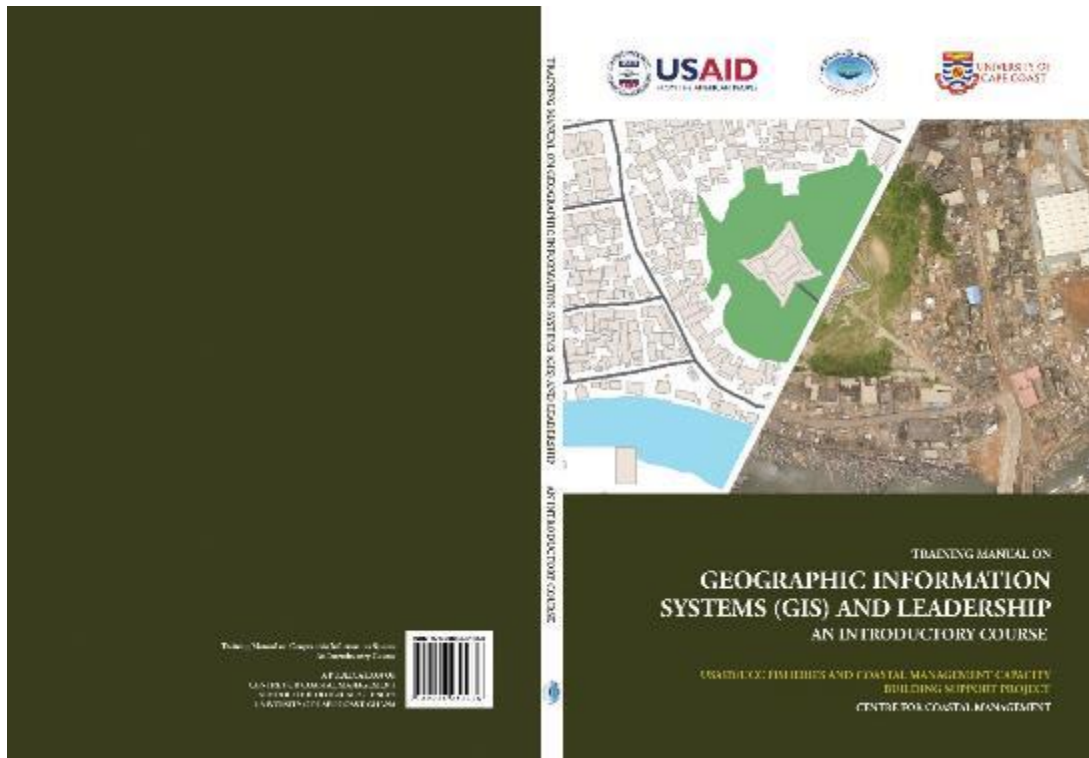


Figure 35: Training Manual on Introductory GIS and Leadership, CCM

6.5 Activity 2.2.5: Engaging Policy Makers to Address Coastal and Fisheries Issues

The activity on engaging policy makers to address fisheries and coastal issues has been running concurrently with the activity on conducting research on marine fisheries governance issues and therefore issues reported previously under the activity on conducting research on marine fisheries governance issues also apply to the activity on engaging policy makers to address fisheries and coastal issues.

6.6 Activity 2.2.6: Building Institutional Partnerships and Collaboration

During this reporting period, the project continued and strengthened its collaboration with partnering institutions notably the Ministry of Fisheries and Aquaculture Development, the Sustainable Fisheries Management Project, the Coastal Sustainable Landscapes Project, sister Universities both home and abroad, Hen Mpoano and Friends of the Nation. The project actively collaborated with relevant institutions which led to the completion of the first phase

and subsequent launch of the fisheries and coastal management database. Collaboration between the SFMP and URI continued with discussions on the possibility of running dual degree programs between URI and UCC which led to the promotion of further collaboration between the Schools of Business, Biological Sciences, Pharmacy and Physical Sciences of UCC and URI. The collaboration between URI and the UCC culminated in a proposed high delegation visit by the UCC to the URI in the next quarter to deepen the partnership and fashion out the roadmap to the actual implementation of programs envisaged.

6.7 Activity 2.2.7: Wetlands Ecological Health Monitoring Using School Clubs and Communities

The project has existing Memorandum of Understanding (MoUs) for cooperation with Hen Mpoano, Friends of the Nation and the USAID/Ghana Coastal Sustainable Landscapes Project and trained teachers from some selected schools in the Western and Central Regions to jointly monitor the ecological health of some selected wetlands using students from the schools through the wetlands educational training program developed by DFAS. In operationalizing the MoUs, the Department of Fisheries and Aquatic Sciences organized a training workshop at the University of Cape Coast to sensitize and train teachers to facilitate the program and supervise their successful implementation. The objective of the workshop was to introduce the teachers to the training modules and ecological benchmarks for monitoring coastal wetlands, identify key issues and facilitate the development of monitoring and management programs for the selected wetlands using their students.



Figure 36: DFAS and partner NGOs train Junior High School teachers on wetland monitoring curriculum

6.8 Activity 2.2.8: Strengthening Community-based Groups

This activity has the objective to strengthen the capacity of community-based groups to acquire the necessary skills needed to facilitate programs in coastal resources management. Community-based groups have been formed and strengthened in the previous years to equip them with community-based fisheries management skills and to support development actions in their coastal communities. In Year 3, capacity building and training of the community-based groups will continue to provide further support needed. The project expects that this phase will demonstrate the capacity of the various beneficiary groups to lead the management and utilization of their own resources through capacity strengthening of the identified groups. A facilitator was identified and contracted in this reporting period to support the project achieve this objective in the coming quarter. Results achieved will be documented in the next quarterly report.

6.9 Activity 2.2.9: Promoting Supplementary Livelihoods in Coastal Communities

The activity has the objective to provide support for coastal inhabitants in the targeted communities in snail rearing, bee-keeping and oyster farming to enhance community livelihoods, to provide alternative sources of income for community members, and enhance the sustainable management of fisheries and other coastal resources in the selected communities. In the past year, technical experts were identified to conduct training for the community-based group members in the selected supplementary livelihood activities in collaboration with the project's community facilitator to equip them with the needed skills to successfully implement such activities. The community facilitator and the technical experts are scheduled to continue with this activity in Year 3 with the aim of sustaining progress made in previous years by ensuring that demonstration sites that were set up run effectively and efficiently to enable selected community members to establish their individual projects.

APPENDICES

Appendix 1: Flyer developed for Fisheries Management Short Course

Overview
 Ghana's fisheries have witnessed a decline over the years due to several factors including over-fishing, over-exploitation, inappropriate methods, environmental degradation, and over-exploitation of fishery resources. As a result, the fish stocks have declined, leading to declining fish production levels. Despite an increase in fishing effort, this is indicative of over-exploitation of the fishery. The short course for coastal and inland fishery resource managers is meant to benefit the sector and fishery managers. The fisheries management course is therefore designed in this light and is designed to provide knowledge and skills needed to manage fisheries sustainably.

Who Will Benefit from Attending?
 Individuals actively working in tandem with the Ministry of Fisheries and Aquaculture Development (MFA&I) and the Fisheries Commission or who have or are involved with fishery management, fisheries extension and development including Regional and District offices, Fisheries Scientific Service Division (SSD), Monitoring, Control and Surveillance Division (MCS&S), Ghana Inshore Fisheries Association (GIFA), Ghana Coastal Fisheries Association (GACFA), Ghana Fish Farmers Association (GFFA), Ghana Fish Auctions (GFA), development organizations and NGOs, industry partners and graduate students, students and researchers in the field of fisheries management.

Knowledge Building Sessions
 The course contains the modules which include the following:

Module 1: Introduction to Fisheries
 The course introduces participants to the state of the sector and their roles, the concept of fisheries and stocks. The types of gear used in harvesting the resources are introduced. The structure of the sector and Government fisheries organizations are discussed.

Module 2: Need for Fisheries Management
 This module highlights the requirements for fisheries management, reasons for decline in fisheries management, the need for fisheries management in fisheries management. The types of gear used for specific fisheries management strategies are discussed.

Module 3: Scope and Approaches of Fisheries Management
 The course reviews participants to the various approaches to fisheries management. It gives participants the opportunity to understand the different management approaches, their specific fisheries resources and the various methods used to fish. The module also stresses the importance and benefits of fisheries management to the fisheries management.

Module 4: Fisheries Management Planning, Regulations and Institutions
 The module enables participants to examine the need for fisheries management policies, strategies and laws. The module also discusses the various policies, strategies and laws that are in place to manage fisheries and the various fisheries management institutions and fisheries.

Module 5: Strategies for Fisheries Management
 The module covers the various fisheries management approaches and the implementation of management strategies. It also discusses the various fisheries management, policy, strategy and plans.

Expected Outcomes
 At the end of the course participants will be able to:

- Understand the state of fisheries and the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies

Short Course on FISHERIES MANAGEMENT
 20th - 23rd March, 2017

Overview
 The Centre for Coastal Management (CCM) of the Ministry of Fisheries, Aquaculture and Irrigation (MFA&I) is pleased to announce the 20th participants for the short course on Fisheries Management.

Who Will Benefit from Attending?
 Individuals actively working in tandem with the Ministry of Fisheries and Aquaculture Development (MFA&I) and the Fisheries Commission or who have or are involved with fishery management, fisheries extension and development including Regional and District offices, Fisheries Scientific Service Division (SSD), Monitoring, Control and Surveillance Division (MCS&S), Ghana Inshore Fisheries Association (GIFA), Ghana Coastal Fisheries Association (GACFA), Ghana Fish Farmers Association (GFFA), Ghana Fish Auctions (GFA), development organizations and NGOs, industry partners and graduate students, students and researchers in the field of fisheries management.

Knowledge Building Sessions
 The course contains the modules which include the following:

Module 1: Introduction to Fisheries
 The course introduces participants to the state of the sector and their roles, the concept of fisheries and stocks. The types of gear used in harvesting the resources are introduced. The structure of the sector and Government fisheries organizations are discussed.

Module 2: Need for Fisheries Management
 This module highlights the requirements for fisheries management, reasons for decline in fisheries management, the need for fisheries management in fisheries management. The types of gear used for specific fisheries management strategies are discussed.

Module 3: Scope and Approaches of Fisheries Management
 The course reviews participants to the various approaches to fisheries management. It gives participants the opportunity to understand the different management approaches, their specific fisheries resources and the various methods used to fish. The module also stresses the importance and benefits of fisheries management to the fisheries management.

Module 4: Fisheries Management Planning, Regulations and Institutions
 The module enables participants to examine the need for fisheries management policies, strategies and laws. The module also discusses the various policies, strategies and laws that are in place to manage fisheries and the various fisheries management institutions and fisheries.

Module 5: Strategies for Fisheries Management
 The module covers the various fisheries management approaches and the implementation of management strategies. It also discusses the various fisheries management, policy, strategy and plans.

Expected Outcomes
 At the end of the course participants will be able to:

- Understand the state of fisheries and the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies

Short Course on FISHERIES MANAGEMENT
 20th - 23rd March, 2017

Appendix 2: Flyer developed for Introductory GIS and Leadership Short Course

Overview
 The Centre for Coastal Management (CCM) of the Ministry of Fisheries, Aquaculture and Irrigation (MFA&I) is pleased to announce the 15th participants for the short course on Geographic Information Systems (GIS) and Leadership.

Who Will Benefit from Attending?
 Individuals actively working in tandem with the Ministry of Fisheries and Aquaculture Development (MFA&I) and the Fisheries Commission or who have or are involved with fishery management, fisheries extension and development including Regional and District offices, Fisheries Scientific Service Division (SSD), Monitoring, Control and Surveillance Division (MCS&S), Ghana Inshore Fisheries Association (GIFA), Ghana Coastal Fisheries Association (GACFA), Ghana Fish Farmers Association (GFFA), Ghana Fish Auctions (GFA), development organizations and NGOs, industry partners and graduate students, students and researchers in the field of fisheries management.

Knowledge Building Sessions
 The course contains the modules which include the following:

Module 1: Introduction to Fisheries
 The course introduces participants to the state of the sector and their roles, the concept of fisheries and stocks. The types of gear used in harvesting the resources are introduced. The structure of the sector and Government fisheries organizations are discussed.

Module 2: Need for Fisheries Management
 This module highlights the requirements for fisheries management, reasons for decline in fisheries management, the need for fisheries management in fisheries management. The types of gear used for specific fisheries management strategies are discussed.

Module 3: Scope and Approaches of Fisheries Management
 The course reviews participants to the various approaches to fisheries management. It gives participants the opportunity to understand the different management approaches, their specific fisheries resources and the various methods used to fish. The module also stresses the importance and benefits of fisheries management to the fisheries management.

Module 4: Fisheries Management Planning, Regulations and Institutions
 The module enables participants to examine the need for fisheries management policies, strategies and laws. The module also discusses the various policies, strategies and laws that are in place to manage fisheries and the various fisheries management institutions and fisheries.

Module 5: Strategies for Fisheries Management
 The module covers the various fisheries management approaches and the implementation of management strategies. It also discusses the various fisheries management, policy, strategy and plans.

Expected Outcomes
 At the end of the course participants will be able to:

- Understand the state of fisheries and the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies

Short Course on Geographic Information Systems (GIS) INTRODUCTORY COURSE
 15th - 17th March, 2017

Overview
 The Centre for Coastal Management (CCM) of the Ministry of Fisheries, Aquaculture and Irrigation (MFA&I) is pleased to announce the 15th participants for the short course on Geographic Information Systems (GIS) and Leadership.

Who Will Benefit from Attending?
 Individuals actively working in tandem with the Ministry of Fisheries and Aquaculture Development (MFA&I) and the Fisheries Commission or who have or are involved with fishery management, fisheries extension and development including Regional and District offices, Fisheries Scientific Service Division (SSD), Monitoring, Control and Surveillance Division (MCS&S), Ghana Inshore Fisheries Association (GIFA), Ghana Coastal Fisheries Association (GACFA), Ghana Fish Farmers Association (GFFA), Ghana Fish Auctions (GFA), development organizations and NGOs, industry partners and graduate students, students and researchers in the field of fisheries management.

Knowledge Building Sessions
 The course contains the modules which include the following:

Module 1: Introduction to Fisheries
 The course introduces participants to the state of the sector and their roles, the concept of fisheries and stocks. The types of gear used in harvesting the resources are introduced. The structure of the sector and Government fisheries organizations are discussed.

Module 2: Need for Fisheries Management
 This module highlights the requirements for fisheries management, reasons for decline in fisheries management, the need for fisheries management in fisheries management. The types of gear used for specific fisheries management strategies are discussed.

Module 3: Scope and Approaches of Fisheries Management
 The course reviews participants to the various approaches to fisheries management. It gives participants the opportunity to understand the different management approaches, their specific fisheries resources and the various methods used to fish. The module also stresses the importance and benefits of fisheries management to the fisheries management.

Module 4: Fisheries Management Planning, Regulations and Institutions
 The module enables participants to examine the need for fisheries management policies, strategies and laws. The module also discusses the various policies, strategies and laws that are in place to manage fisheries and the various fisheries management institutions and fisheries.

Module 5: Strategies for Fisheries Management
 The module covers the various fisheries management approaches and the implementation of management strategies. It also discusses the various fisheries management, policy, strategy and plans.

Expected Outcomes
 At the end of the course participants will be able to:

- Understand the state of fisheries and the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies
- Understand the various fisheries management strategies

Short Course on Geographic Information Systems (GIS) INTRODUCTORY COURSE
 15th - 17th March, 2017

Appendix 3: List of Project Performance Indicators and FY 2017 Second Quarter Results

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
1	Quantities and/or sizes of fish landed by selected canoe fishermen in the Central and Western Regions of Ghana.	-	-	-	-
<p>Comments: It is difficult to set baselines, annual targets and performance achieved in a particular reporting period due to the nature of this indicator. Results obtained from data collected through fish stock assessments indicate decline in catches of targeted fish stocks possibly due to increased fishing effort. Results also show that the modal sizes of most of the targeted fish species fall below the minimum permissible landing sizes of commercially important fish species proposed in the Fisheries Act 625 of 2002 but mean sizes of majority of fish species assessed were higher than the minimum legal landing size enshrined in Ghana Fisheries Regulations (2010).</p>					
2	Fishing Mortality at MSY (F_{msy})	-	-	-	-
<p>Comments: Project Activity 2.1.1: Conducting Fisheries Stock Assessment provides data for this indicator. It is similarly difficult to set baselines, annual targets and performance achieved in a particular reporting period due to the nature of this indicator. Fishing Mortality at Maximum Sustainable Yield (MSY) will be determined at the end of the fish stock assessment period.</p>					
3	Biomass to produce MSY (B_{msy})	-	-	-	-

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
<p>Comments: Project Activity 2.1.1: Conducting Fisheries Stock Assessment provides data for this indicator. It is similarly difficult to set baselines, annual targets and performance achieved in a particular reporting period due to the nature of this indicator. Biomass to produce Maximum Sustainable Yield (MSY) will be determined at the end of the fish stock assessment period.</p>					
4	Number of hectares of biological significance and/or natural resources under improved natural resource management as a result of USG assistance.	0	6.9 hectares	-	-
<p>Comments: An adopted lagoon at Half Assini and its wetland area measuring 6.9 hectares has been surveyed to be put under improved natural resource management in collaboration with community members and the Jomoro District Assembly. Key actions are ongoing in Year 3 towards the monitoring of biodiversity and environmental conditions of the lagoon and its ecological health restoration.</p>					
5	Number of hectares in areas of biological significance and/or natural resource showing improved biophysical conditions as a result of USG assistance	0	6.9 hectares	-	-
<p>Comments: An adopted lagoon at Half Assini and its wetland area measuring 6.9 hectares has been surveyed to be put under improved natural resource management in collaboration with community members and the Jomoro District Assembly. Key actions are ongoing in Year 3 towards the monitoring of biodiversity and environmental conditions of the lagoon and its ecological health restoration. Number of hectares of the lagoon and wetland area showing improved biophysical conditions will be determined from the monitoring exercise.</p>					

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
6	Number of training and capacity building activities conducted with USG assistance	0	10	40	Yes
<p>Comments: 10 training and capacity building activities have been targeted for FY 2017. None of them was planned to take place in the first quarter. Two (2) training (Geographic Information Systems and Fisheries Management) and 2 capacity building (Proposal writing and Strategic Planning for DFAS) activities took place in the second quarter.</p>					
7	Number of people receiving USG supported training in natural resources management and/or biodiversity conservation	0	200	0	Yes
<p>Comments: Two-hundred (200) training participants have been targeted to benefit from natural resources management and/or biodiversity conservation training in FY 2017. None of those training activities occurred in the first and second quarter. Training in natural resources management and/or biodiversity conservation will take place in the third and fourth quarter.</p>					
8	Number of person hours of training in natural resources management and/or biodiversity conservation supported by USG assistance	0	3000	0	Yes

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
<p>Comments: No training in natural resource management and/or biodiversity conservation took place in the second quarter. Training in natural resources management and/or biodiversity conservation will take place in the third and fourth quarter. Number of person hours of training will be counted and recorded when the trainings take place.</p>					
9	Number of individuals who have received USG supported long-term agricultural sector productivity or food security training	0	28	100	Yes
<p>Comments: Twenty-eight (28) students have been targeted to receive long-term training in FY 2017. During the quarter under review, 11 PhD students (3 males, 8 females), and 17 MPhil students (7 males, 10 females) received USG supported long-term agricultural sector productivity or food security training, making a total of 28 individuals, 10 males and 18 females.</p>					
10	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	0	50	48	Yes
<p>Comments: During the quarter under review, 2 short-term agricultural sector productivity or food security trainings (Geographic Information Systems and Fisheries Management) took place. Twenty-four (24) participants took part in both training programs, 15 males and 9 females.</p>					

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
11	Number of food security private enterprises (for profit), producers' organizations, water users' associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance	0	10	0	Yes
<p>Comments: Ten (10) community-based organizations have been targeted to receive assistance in FY 2017. Four (4) of such organizations received technical assistance in supplementary livelihood activities (snail farming and bee-keeping) in 4 selected coastal communities in the Western and Central region in the first quarter. None of them received assistance in the quarter under review.</p>					
12	Number of private enterprises (for profit), producers' organizations, water users' associations, women's groups, trade and business associations, and community-based organizations (CBOs) that applied new technologies or management practices as a result of USG assistance	0	8	0	Yes
<p>Comments: None of the organizations that received technical assistance in supplementary livelihood activities applied new technologies or management practices in this reporting period. Numbers will be counted and reported when Year 3 activities are fully implemented in the coming quarters.</p>					

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
13	Number of members of producer organizations and community based organizations receiving USG assistance	0	200	0	Yes
<p>Comments: Two-hundred (200) members have been targeted to receive assistance in FY 2017. Eighty (80) members in total in the 4 Community-Based Fisheries Management Groups (CBFMGs) formed in the 8 selected fishing communities received technical assistance in supplementary livelihoods activities by the project in the first quarter of FY 2017. None of the members received assistance in the second quarter.</p>					
14	Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	0	150	0	Yes
<p>Comments: None of the members of the community-based groups who received technical assistance in supplementary livelihood activities applied new technologies or management practices in the quarter under review.</p>					
15	Number of rural households benefiting directly from USG interventions	0	200	40	Yes
<p>Comments: Eighty (80) rural households benefited directly from project interventions through supplementary livelihood support in the quarter under review.</p>					

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
17	Score, in percent, of combined key areas of organization capacity amongst USG direct and indirect local implementing partners	-	-	80.13	Yes
<p>Comments: An Organizational Capacity Assessment has been conducted for DFAS and CCM. The assessment covered 8 major areas; 1) Governance 2) Administration 3) Human Resources 4) Financial Management 5) Organizational Management 6) Program Management 7) Network Capacities and 8) Policy Analysis and Advocacy and arrived at a total score of 80.13%.</p>					
18	Number of beneficiaries receiving improved infrastructure services due to USG assistance	0	120	100	Yes
<p>Comments: One-hundred and twenty (120; 82 males and 38 females) people made up of 11 senior staff members, 6 Research Assistants, 5 Administrative staff, 8 Technical staff, 40 post-graduate students and 50 undergraduate students were beneficiaries of refurbished library, fisheries and coastal management laboratory, project vehicles and the premises of DFAS and the Center for Coastal Management in this reporting quarter.</p>					
19	Number of new research collaborations established between USG-supported beneficiaries and other institutions	0	10	0	Yes
<p>Comments: No new research collaborations were established in the second quarter of FY 2017.</p>					

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
20	Number of scientific studies published or conference presentations given as a result of USG assistance for research programs	0	5	0	Yes
Comments: No scientific studies were published and no conference presentations given in the quarter under review.					
21	Number of dialogues and stakeholder consultations held on fisheries and coastal management	0	5	20	Yes
Comments: In the quarter under review, the project organized 1 national stakeholder consultation on the establishment of a fisheries and coastal management database in Accra.					
22	Percentage of graduates from USG-supported tertiary education programs employed	0	5	0	No
Comments: No DFAS graduates were reported as employed in the second quarter of FY 2017.					
23	Number of CSOs and government agencies strengthened	0	10	120	Yes

No.	Indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Yes/No
<p>Comments: Representatives of the following 12 CSOs and government agencies were strengthened through their participation in the GIS and Fisheries management short courses in the quarter under review; Ghana Tuna Association, Ghana Industrial Trawlers Association, Fisheries Alliance, Fisheries Commission, Canoe Council, Star Oil Company, Wester Regional Coordinating Council, KEEA Municipal Assembly, Shama District Assembly, Ellemele District Assembly, Jomoro District Assembly and Gomoa West District Assembly.</p>					
24	Total number of direct beneficiaries	0	300		Yes
<p>Comments: Two-hundred and twenty-four (224; 137 males and 87 females) people benefitted directly from project interventions in the second quarter of FY 2017.</p>					