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**UNIVERSITY OF
CAPE COAST**

USAID/UCC FISHERIES AND COASTAL MANAGEMENT
CAPACITY BUILDING SUPPORT PROJECT

YEAR FOUR
2ND QUARTER REPORT

1ST JANUARY – 31ST MARCH, 2018

DEPARTMENT OF FISHERIES AND AQUATIC SCIENCES
UNIVERSITY OF CAPE COAST

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Cover Photo: USAID Missions Director, Sharon Cromer, in a group photograph with some faculty and scholarship students of DFAS.

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LIST OF ABBREVIATIONS

ASSESS	Analytical Support Services and Evaluations for Sustainable Systems
ATL FM	Atlantic FM
CCM	Centre for Coastal Management
CDCS	Country Development Cooperation Strategy
CEPS	Customs, Excise and Preventive Service
CFCE	Conference on Fisheries and Coastal Environment
CSLP	Coastal Sustainable Landscape Project
DFAS	Department of Fisheries and Aquatic Sciences
DTU	Technical University of Denmark
FON	Friends of the Nation
FtF	Feed the Future
GC	Gas Chromatographic Unit
GCRF	Global Challenges Research Fund
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GMMB	Ghana Museums and Monuments Board
JFCoM	Journal of Fisheries and Coastal Management
KNUST	Kwame Nkrumah University of Science and Technology
M&E	Monitoring and Evaluation
MoFAD	Ministry of Fisheries and Aquaculture Development
PMP	Performance Management Plan
<i>RV</i>	Research Vessel
SFMP	Sustainable Fisheries Management Project
SSBPR	Spawning Stock Biomass per Recruit
YPR	Yield per Recruit
BPR	Biomass per Recruit
SOP	Standard Operating Procedure
UCC	University of Cape Coast
UAV	Unmanned Aerial Vehicle
UK	United Kingdom
URI	University of Rhode Island
USAID	United States Agency for International Development
USG	United States Government

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EXECUTIVE SUMMARY

Ghana has considerable potential in marine fisheries that could be harnessed for improved nutrition, business development and economic growth, but unsustainable fishing practices, inequitable resource distribution, climate change and pollution are undermining living conditions of fishing communities and food security of Ghanaians as a whole. Overfishing results in depletion of the fish stocks and brings about changes in the marine ecosystems. Weak governance, insufficient scientific and technical competence in fisheries resource management stand in the way of improving the situation in Ghana. Insufficient data or the lack of access to data is undermining effective research-based knowledge, which are necessary for sustainable, ecosystem-based management. These issues militate against efforts to improve nutrition, health and reduce poverty. The USAID funded Fisheries and Coastal Management Capacity Building Support Project in partnership with the University of Cape Coast (UCC) contributes to the capacity needs in the fisheries sector. Given the contribution of fisheries to agricultural GDP, there is a critical need to address the problem of overfishing - characterized by illegal activities, overcapitalization and government subsidies -if the Ghana Poverty Reduction Strategy is to be realized. During this quarter, the project achieved certain milestones including the successful hosting of the Mission Director of USAID/Ghana, Ms. Sharon Cromer during a day's working to the University of Cape Coast. Training and research by students funded under the program were strengthened through fieldwork, laboratory work and supervision. Also two project staff members attended a training session on TraiNet at USAID/West Africa ASSESS Project office in Accra to augment their capacity. The project also played host to the Acting Director of the Ghana Museums and Monuments Board (GMMB) as part of discussions for an offsite facility for the Centre for Coastal Management (CCM) at Fort. St. Jago in Elmina. The project also advertised, interviewed and selected five (5) undergraduate students for the J-term Summer School Exchange Program at the University of Rhode Island. It is noteworthy that Ghana's first Journal on Fisheries and Coastal Management facilitated by this project was opened to receive manuscripts and the online database on fisheries and coastal management, Fishcomghana within this quarter alone, recorded over 2000 visitors with 76 downloads of documents from the site. Most of the users (63%) were youthful occurring between the ages 18-34 years, probably students and early career professionals.

1.0 INTRODUCTION

1.1 Ghana's Marine Fisheries Sector

Ghana has valuable marine fisheries resources that contributes 5% to annual national gross domestic product (GDP). The sector indirectly supports the livelihoods of 2.2 million people or 10% of the Ghanaian population. Unfortunately the economic fortunes from these fisheries are being dwindled due to low investment in fisheries management and the associated value addition is not given priority. Illegal fishing is pervasive and there are too many vessels catching few fish leading to cost overruns i.e. cost of fishing exceed the amount of income that is being generated, at least compared to ten years ago. As a result the individuals and communities reliant on fishing, fishers are getting poorer. Indeed, the industry presently provides little prospects for improving the welfare of fisher folks with ramifications for the national economy as a whole. This has come about as a result of non-compliance with and 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 in the country. Lack of adequate human resource capacity, good governance and well-functioning regulatory structures are a threat to natural resource management in Ghana.

Available fisheries statistics data show that number of fishing vessels as well as fishers have increased beyond sustainable levels with corresponding decreases in fish catch, mainly due to open access nature of small-scale fisheries. Decreases in fish catch result in lower income levels of fishers, which in turn lead to increased levels of poverty particularly in coastal communities. There is a critical need to address the problem of decreasing fish catches, which can only be achieved through improved fisheries management if the Ghana Poverty Reduction Strategy is to be realized. Capacity building is an enabling condition for improved fisheries management. This is a justification for the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project, which has a primary aims of promoting sustainable marine fisheries management in Ghana through capacity building of students, professionals and fishing communities, using effective partnerships across public and private institutions, both local and international. The project is sponsored by the United States Agency for International Development (USAID) through the Feed-the-Future (FtF) Initiative and it contributes to Government of Ghana's national fisheries policies and coastal development objectives.

1.2 Feed-the-Future (FtF) Initiative of the United States Government

Feed-the-Future (FtF) is a United States Government (USG) Initiative to address global hunger and food insecurity. In 2009, President Barack Obama of the United States of America committed US\$3.5 billion over a 3-year period to this global initiative, which was launched in 2010 with the aim of fighting hunger and poverty. FtF is coordinated primarily by the USAID on the basis that every 1% increase in agricultural income per capita reduces the number of people living in extreme

poverty by between 0.6 and 1.8%. No other investment has that return. FtF supports initiatives in fisheries and coastal management with funding because most developing nations lack adequate resource capacity to sustainably exploit and effectively manage their coastal and marine resources.

1.3 The USAID Fisheries and Coastal Management Capacity Building Support Project

The Fisheries and Coastal Management Capacity Building Support Project is a partnership agreement between the USAID and the University of Cape Coast (UCC) which was signed on 24th October, 2014 and being implemented by the Department of Fisheries and Aquatic Sciences (DFAS) of UCC. The project provides DFAS with 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 as part of the USG FtF 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 main purpose of the award is to contribute towards addressing capacity needs in fisheries and coastal management in Ghana. The project was developed to respond to the issues raised in the DFAS SWOT Analysis. It aims at strengthening the institutional capacity of DFAS to train personnel for fisheries and coastal management, and support the Centre for Coastal Management (CCM) at UCC to become fully operationalized. The award also supports the restructuring of integrated data and information support systems for fisheries and coastal management, which serve as building blocks for evidence-based policy formulation and decision making at all levels. Project activities contribute to USAID's development strategy for Ghana as outlined in its Country Development Cooperation Strategy (CDCS), and also respond to USAID/Ghana Development Objective 2: Sustainable and Broadly Shared Economic Growth. Expected outcomes from the five-year project include the building of significant capacity for sustainable marine fisheries and coastal management in Ghana, and ensuring that management outcomes become more evident.

Local scientific capacities are strengthened in specific areas such as the provision of quality and relevant educational programs, practical research, extension and advisory services to support the management of Ghana's fisheries and coastal resources, which will enhance the country's social and economic development. Relevant partnerships are built 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 relevant Academic Departments at the University of Rhode Island (URI). This project has also formed important collaborations with relevant government partners including the Ministry of Fisheries and Aquaculture Development (MoFAD), the Fisheries Commission of Ghana, as well as 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.

The capacities of academic and technical staff of DFAS and the CCM are continuously strengthened to enhance the use of new technologies and scientific equipment, through the 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 development of fisheries and coastal management database, working with other international data sources and host centres. These initiatives are aimed to facilitate the training of 10 PhD, 20 Masters and 150 Undergraduate students. The award also includes funding for short courses on climate change adaptation and mitigation in coastal communities, fisheries and coastal management and Geographic Information Systems (GIS) for targeted professionals over the course of five years, which are all facilitated by the Centre for Coastal Management (CCM) as part of its operationalization.

The project also supports the implementation of a DFAS Strategic Plan, development of a Business Plan for CCM, policy dialogues, and critical research with the help of the refurbished Fisheries and Coastal Research Laboratory. The project conducts research to generate data and information to fill key knowledge gaps that are required for a more effective implementation of Ghana's Fisheries and Aquaculture Sector Development Plan, and undertakes community outreach and extension programs to improve long-term national capacity on fisheries and coastal issues, train personnel in relevant government agencies, and strengthen their links to a network of researchers within national and international research organizations.

1.4 The Department of Fisheries and Aquatic Sciences of the University of Cape Coast

The University of Cape Coast (UCC) is located close to the Atlantic Ocean, which provides vast opportunities for the Department of Fisheries and Aquatic Sciences (DFAS) of UCC to become one of the leading institutions in the area of Fisheries and Marine Sciences in Ghana. DFAS has a vision to become an internationally recognized partner in the conservation of healthy aquatic ecosystems for sustained provision of goods and services, in collaboration with public and private institutions. This vision has been facilitated by the initiation of the USAID funding support to DFAS. The capacity of DFAS has been strengthened through the USAID support with the provision of adequate logistics and teaching infrastructure, which has made DFAS more attractive to an increasing number of students wanting to undertake studies at the School of Biological Sciences, and also enhanced opportunities for institutional collaboration. DFAS now has a state-of-the-art laboratory with relevant modern equipment which supports hands-on practical-based training of students. This presents DFAS students with future academic prospects. DFAS offers undergraduate (BSc) degree in Fisheries and Aquatic Sciences and postgraduate (MPhil and PhD) degrees that expose students to:

- Oceanography, Limnology and Aquatic Ecology

- Integrated Coastal Resource Management including Petroleum Ecology and Climate Change Studies
- Aquaculture, bridging gaps between demand and supply in the fishing industry and aquaculture entrepreneurship
- Fisheries Science including fisheries ecology and organismic interactions

1.5 Monitoring and Evaluation (M&E)

Project monitoring and evaluation (M&E) is guided by the project Performance Management Plan (PMP) at the program level to track implementation and output systematically, and measure the effectiveness of program activities. This helps to determine whether the project is on track with implementation of the annual workplan or changes are needed. In the course of program implementation, all activities planned for the second quarter were closely monitored to check if they were actually implemented and within schedule. Activities planned for the second quarter include:

- routine maintenance of project vehicles, procurement of an additional vehicle,
- capacity strengthening for one (1) financial administration staff,
- acquisition of Fort St. Jago as part of CCM operationalization,
- capacity strengthening for staff of CCM,
- awarding research grants to 27 DFAS undergraduate students and 20 others from sister universities,
- supporting 5 students from DFAS for Summer School Exchange Program at URI
- supporting research on fishing gear technology,
- conducting research and assessment on marine fisheries governance issues,
- research on fish and shellfish of commercial value,
- monitoring the biodiversity and health of coastal ecosystems,
- providing editorial competency training for managers of FishCoMGhana,
- providing FishCoMGhana editorial team with tools for publicity,
- planning a facilitation process, identifying training participants and conducting short course on Integrated Coastal Zone Management, Fisheries Management and Geographic Information System.
- procuring a high speed desktop computer to process high resolution images from UAV

Close to the end of the quarter, the project responded to an invitation from partners at URI to attend a training workshop on TraiNet (Training Information Network). Two project support staff, together with other some implementing partners (i.e. ASSESS, KNUST, and SFMP) participated in the training session held at USAID/West Africa ASSESS Project office in Accra. The purpose of the training was to refresh the competency of existing responsible persons (R1 and R2) as well as provide working knowledge for new responsible persons. Outputs of the training

include improved knowledge on project data entry into TraiNet portal, preparing of project staff for J-1 TraiNet visas and required measures for training programs organized in-country and in third countries.

2.0 PROGRAM COMPONENTS, MANAGEMENT AND ACTIVITIES IN THE SECOND QUARTER OF YEAR 4

2.1 Activities Completed in the Second Quarter

Key Activities Completed within the Second Quarter:

- Submission of a completed project report covering activities undertaken during the first quarter of FY four.
- CCM hosted the Acting Director of the Ghana Museums and Monuments Board (GMMB) in a follow-up visit to the University of Cape Coast in furtherance of discussions concerning the use of Fort. St. Jago by the Centre as a satellite location for direct community contact towards sustainable management of Ghana's fisheries resources.
- The Project successfully hosted the Mission Director Ms. Sharon Cromer during a day's working visit to the three coastal projects, i.e. Fisheries and Coastal Management Capacity Building Support Project, Coastal Sustainable Landscapes Project, and Sustainable Fisheries Management Project. The purpose of this visit was to meet with managers and key stakeholders of three projects funded under the United States Government's Feed the Future initiative, to have a better understanding of what these projects entail and progress made thus far.



Figure 1: Sharon Cromer visits the Fisheries and Coastal Research Laboratory at DFAS UCC

- Two project staff attended a training session on TraiNet at USAID/West Africa ASSESS Project office in Accra.
- Advertising, interviewing and selection of applicants for Summer School Exchange Program at URI.

- Advertisement for admissions into postgraduate programs at the department of Fisheries and Aquatic Sciences (DFAS) for the 2018/19 academic year.
- Ghana’s first Journal on Fisheries and Coastal Management was open for submission of manuscripts.

SUCCESS STORY

DAA Oyster Group “Adapts” DFAS Research Technology to Farm Oysters at Tsokomey



Men support with mounting of “bamboo racks vertically fitted with stranded oyster shells” at Tsokomey – adapted from technology designed by DFAS oyster research team

The Department of Fisheries and Aquatic Sciences of the University of Cape Coast has set out plans and currently implementing a number of activities including research to provide supplementary livelihoods for coastal dwellers in Ghana. The country’s fisheries sector is reported to be dwindling over the last few years. This necessitates action to develop capacities and diversify livelihood options for many who are into trades along the fisheries value chain. Among livelihoods programmes coordinated at the Department with support from the United States Agency for International Development (USAID) are snail rearing, beekeeping, and oyster farming in Half Assini, Anlo Beach and Ekumfi Narkwa, all of which are coastal communities.



The oyster farming activity is supported with intensive research at DFAS through postgraduate scholarships and research grants, under the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project. Oyster research areas include; assessment of the quality and health of coastal waterbodies to support oyster aquaculture; assessment of socioeconomics of the oyster fishery and culture potential; and developing strategies and techniques for spat collection and rearing of oysters. Preliminary results of spat collection and culture experiments at the estuarine areas of the Densu River Delta has yielded positive outcome as members of the Tsokomey community have adopted the holding facility and culture technology being used by researchers from DFAS.

The Development Action Aid (DAA), through the USAID funded Sustainable Fisheries Management Project (SFMP), has brought together oyster fishers from Tsokomey and surrounding communities in an effort to manage the fishery and promote sustainable use of oysters at the Densu Delta estuary. Harvesting and trade of oysters is predominantly done by women and children. Researchers from DFAS have worked closely with two members of DAA. The two over the last six months have received applicable knowledge and skills through their assistance and involvement in field research activities including the use of bamboos for the construction of racks fitted with strands of oyster shells as holding facilities, among others, in oyster aquaculture. This transfer of knowledge is expected to influence many households and fortify women's resilience in the face of climate impacts and dwindling fish stocks in Ghana.

3.0 PROJECT OUTPUT 1.1: IMPROVED INFRASTRUCTURE

3.1 Activity 1.1.1: Renovating and Equipping Fisheries and Coastal Research Laboratory

This activity was largely completed in previous quarters and project management was focused on procuring one major equipment- a Gas Chromatographic Unit- needed to analyze volatile substances in the gaseous phase. During last quarter, the GC unit was purchased and transported into the country from abroad. In this quarter, project management therefore initiated actions geared towards the clearing of the GC unit but was hindered by some unforeseen challenges: (a) there was no funds to pay for the duty of the GC unit and (b) notice of termination of issuance of duty exemption by the state. The options available include applying to clear on permit which is likely to result in a higher cost due to new rates for storage, making a deposit for the calculated duty (cheque will be accepted), in which case CEPS will hold onto the cheque until the duty exemption is granted by the state. The cheque will then be refunded when exemption is received. Despite these challenges, project management is resolute on getting the equipment cleared in time through any appropriate means. Also in this quarter, efforts were hastened to get the research vessel *RV Sardinella* registered. In this regard, project management, in consultation with the Ghana Maritime Authority, contacted a sailor with the intent to contract him on a short-term basis to assist the project in the registration and manning of the vessel. Given this development, it is expected that the vessel will be registered soon to facilitate research activities of the project and DFAS. Also, as part of laboratory management system, standard operating procedures (SOP) are being developed by the technical staff in consultation with personnel Ghana Standards Authority.

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

There were no planned activities for this activity for this quarter (See Year 4 Program Implementation Plan; FY 2018 First Quarter Report).

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

The project has so far acquired three vehicles (i.e. one Ford pick-up, one Toyota Cross-country, and one Toyota Coaster bus) to facilitate research and project activities and performed routine maintenance of these vehicles. However increasing volume of work and pressure on the vehicles

have necessitated the project’s request for an additional vehicle. During this quarter, the project has followed up on USAID for an approval to purchase the additional vehicle.

4.0 PROJECT OUTPUT 1.2 INCREASED TECHNICAL AND SCIENTIFIC KNOWLEDGE

4.1 Activity 1.2.1: Academic and Technical Staff Capacity Strengthening

The project has followed a plan aimed at strengthening the capacities of DFAS and CCM Academic and Technical staff since its inception coupled with Organizational Capacity Needs Assessment conducted for DFAS and CCM in Year 3 by USAID AfricaLead conducted an to identify areas for Academic and Technical Staff Capacity strengthening.

In the second quarter, Project Management has the following planned out:

Table 1: Progress of scheduled actions for FY 18 Quarter 2

Proposed actions	Target	Completion	Remark
Strengthen the capacity of Academic and Technical staff	One (1) technical staff One (1) financial administrative staff	Not done	Relevant training programs identified There was unavailability of funds to implement this activity

4.2 Activity 1.2.2: Operationalization of the Centre for Coastal Management

The Centre for Coastal Management, which was established on special relationship with DFAS, is a major focus of the Project. Several activities have already been implemented in pursuit of full operationalization and autonomy of the Centre. Key among these is the search for a location somewhere in the coastal communities from where the Centre could operate. In the previous quarters, Project Management has been in discussions with officials of the Ghana Museums and Monuments Board (GMMB), on the possibility of using the Fort St. Jago as the Centre for Coastal Management. In pursuit of this, Director for the Centre presented the intent to the GMMB in an earlier meeting in Accra. For the quarter under review, the Acting Director for GMMB payed a working visit to the University of Cape Coast in a follow-up to the Centre’s intent. At UCC, the Ag. Dir. had interactions with the Vice-Chancellor and members of CCM and DFAS. Discussions centered on the restoration of Fort St. Jago in Elmina to project the rich history of the Fort as well as the historical fishing culture and the transformation of the Elmina traditional area. The Ag. Dir. was also presented with a draft MoU for the partnership. This is anticipated to promote tourism and contribute to the sustainable management of Ghana’s marine and fisheries resources.



Figure 2: Ag. Dir. of GMMB (bottom right) in a group photograph with the VC of UCC (bottom left) and other project personnel



Figure 3: Ag. Dir. of GMMB meets with members of DFAS and Project Management to peruse memorandum of agreement



Figure 4: Ag. Dir. of GMMB meets PROVOST of College of Agriculture and Natural Sciences, UCC (left) and the Dean of School of Biological Sciences (right)

In reinforcing the Centre’s position of achieving full operationalization, the Director of CCM participated in a two-day workshop in Accra in respect of an upcoming proposal development by

a consortium of academics from UK, with aim to secure funding for Fort St. Jago. The workshop brought together a working group of British and West-African academic collaborators prepare an interdisciplinary joint research bid targeted in expectation of the next relevant GCRF call for research bids. This quarter also saw renewed commitment to complete the strategic plan for CCM as project core team and staff met to proffer ideas and strategies for the Centre's operations.

As part of the University's commitment to the operationalization of the Centre, a Research Fellow in the person of Dr. Precious Agbeko D. Mattah was officially appointed by to CCM in this quarter. This brings total staff strength to three (3), thereby bolstering efforts to strengthen staff capacity of CCM.

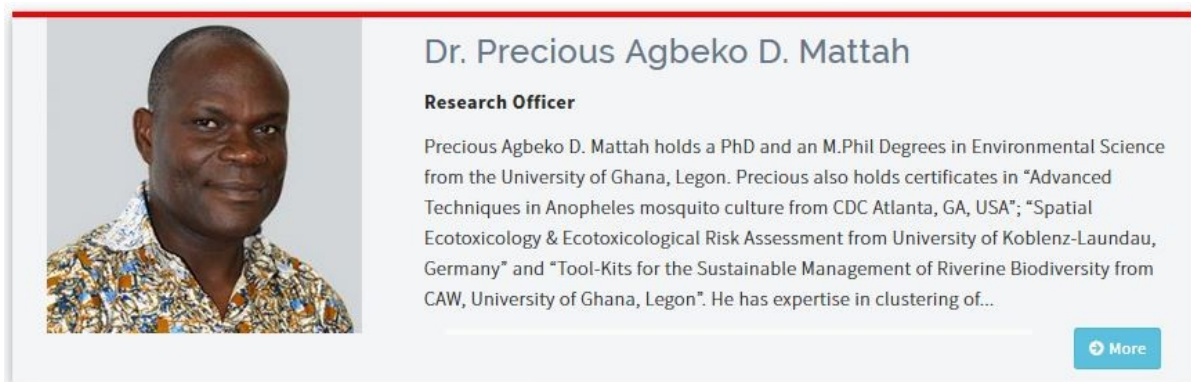


Figure 5: Brief profile of Dr. Mattah as it appears on the CCM website

The University of Cape Coast's Directorate of Research Innovation and Consultancy invited CCM for an interaction for the sole purpose of being brought to speed on the Centre's activity in the broad framework of research and consultancy. This presented the Centre an opportunity to showcase key achievements vis-à-vis the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project. The interaction brought to light the intent of UCC to showcase the Project as one of the top two research projects in an award ceremony, as well as an opportunity for the Project, among five (5) others, to present its mandate and achievements during a specific day set aside for research projects in the University.

The Centre for Coastal Management (CCM) has successfully collaborated with the Technical University of Denmark (DTU) to embark on a joint project aimed at generating knowledge to support research-based management of marine and coastal resources; and the environment. The project dubbed "HOTSPOT" is aimed at strengthening research capacity in Ghana and Denmark through the integration of two research cultures that would provide ideal setting for scientific innovation using current scientific knowledge to address maritime sustainability challenges. HOTSPOT is being funded by the Ministry of Foreign Affairs, Denmark through the Danish Development Cooperation (DANIDA) with a grant of DDK 5 million which is equivalent to US \$ 800,000 for a period of three years thus, 2018-2020. Project implementers include DTU Aqua, UCC-CCM, COWI, LITEHAUZ and Zeal Environmental Technologies.



Figure 6: Launch of HOTSPOT Project being implemented by CCM and DTU-Aqua and Zeal Environmental with funding from DANIDA

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

From the inception of the project till date a total of thirty-six (36) post-graduate students, comprise 20 M.Phil and 16 Ph.D students, have been supported with regards to tuition and research. For the second quarter, 10 M.Phil and 16 Ph.D students have received support to conduct various research works. The project is hopeful of supporting all students admitted to the Department of Fisheries and Aquatic Sciences. Also, one (1) Ph.D student was support to travel to URI on a semester abroad to study. This brings the total number of postgraduate students who participated in the exchange program to five (5). The student will hopefully return to Ghana in the second month of next quarter. This activity sets the pace for the implementation of the dual degree program envisioned for students between UCC and URI.



Figure 7: DFAS advert for postgraduate programs for the 2018/19 academic year

4.4 Activity 1.2.4: Undergraduate Research Grants

In this quarter, all documentations regarding the awarding of research grants to qualified students of sister universities have been completed and submitted to directorate of Finance of UCC pending availability of funds. For this quarter the universities considered include, University of Ghana,

University for Development Studies, University of Energy and Natural Resources and Kwame Nkrumah University of Science and Technology.



Figure 8: DFAS undergraduate students selected for the JTERM program at URI in June 2018

The J-Term Student Exchange program planned to offer DFAS undergraduate students the opportunity of international exposure in the United States of America was initiated in the quarter under review. The program was announced, with participation limited to DFAS undergraduate students, application forms made available to interested students and interviews conducted. A total of 10 students applied and 5 were selected on merit of interview performance and background checks. Processes for the application of J-1 visas had also began and the project is hopes to receive funds soon enough to successfully implement this activity.

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

5.1 Activity 2.1.1: Conducting Fisheries Stock Assessment

This activity has the objective to provide information on the status of stocks of some selected commercially important marine fish species in Ghanaian coastal waters to inform management decision making. Focus has been determining the status of species including cuttlefish (*Sepia officinalis*), shrimp, *Carangidae* (e.g. *Caranx hippos*, *C. chrysos*, *Trachurus* spp. and *Decapterus* spp.) and Sparidae (*Pagellus* spp., *Dentex* spp., and *Pagrus* spp.). In year 2 and 3, a project facilitator was contracted to conduct a year-round assessment, which was concluded in Year 3. Based on the findings of the year round assessments, it was recommended that ecosystem-based fisheries management should be adopted instead of single-species fisheries management approach to



manage all fish species. From Year 3, post-graduate students in DFAS primarily led this activity.

In this quarter, research activities carried out to complement existing information include studies on “Population Dynamics of the Penaeid shrimps (Decapoda: *Penaeidae*) in Ghanaian Waters” by second year M.Phil student. By the end of the

quarter under review, four months of research data had been collected successfully from three major fish landing sites along the coast of Ghana i.e. Elmina fish landing quay and the Takoradi and Tema fishing harbors respectively. Preliminary information on species composition and abundance, habitat distribution, mortality and exploitation rates of the shrimps has been analyzed. Data collection is expected to end in the third quarter of Year 4 as she rounds up the research with findings to feed into management decision.

5.2 Activity 2.1.2: Conducting Research and Assessment on Marine Fisheries Governance

Issues

Project Management relied on the services of external facilitators to conduct research and assessment on marine fisheries governance issues throughout Year 2 and Year 3. Management's intention to continuously engage the services of external facilitators to lead this activity in Year 4 is on hold due to lack of funds. However, to supplement existing information as well as develop new paradigms, an M.Phil student is currently researching on the topic: "Traditional Fisheries Governance System: Their Social and Ecological Implications on Artisanal Fisheries Management in the Western Region, Ghana". She is working in the six coastal districts of the Western Region in order to evaluate the impacts of traditional fisheries governance systems on fisheries management in Ghana and provide alternative models that can blend both modern and traditional systems resource governance. For this quarter, she has identified (i) historical hierarchy of the coastal fisheries governance systems, (ii) sources of conflict within the existing governance framework, (iii) functional fisheries governance system that incorporates all stakeholders for sustainable fisheries management through focus group discussions and interviews. She is expected to collect more data in Year 4 to complement the information that will be collected by external facilitators.

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

As part of activities for the second quarter of FY 4, a third year Ph.D student is researching on the growth, mortality, and nutrient value of Atlantic chub mackerel in Ghana. For the quarter under review, she has aged chub mackerel sampled and estimated fecundity for Atlantic chub mackerel females with the objective to estimate exploitation levels of chub mackerel in Ghanaian waters as well as investigate the occurrence of chub mackerel in trawl bycatch ("Seiko"). Another studies commissioned at the Ph.D level is on the population dynamics and reproductive studies of three seabreams (*Sparidae*) from Ghanaian waters. Currently in her third year, the student has assessed the status of the seabreams fisheries by evaluating catch trends in their landings to serve as an indicator for the sustainable management of the fisheries. She has presented preliminary results on the relative composition of the species, length-weight relationships, condition factor, BPR, YPR, SSBPR and the size distributions of the species from 18 months of data collection from three locations (Sekondi, Elmina and Tema). Also, the sex ratios, hermaphroditic behavior, maturity curves and the gonadosomatic indices of the species have been determined. Current outputs pave way for further studies such as fecundity and ova diameter determination, processing of the otoliths and reading of the growth rings, conducting interviews at sampling locations on the fishing operations to be carried in subsequent quarters. Both studies, expected to be concluded by fourth

quarter of FY 4, are important as they serve to provide relevant information for fisheries management in Ghana.

An aquaculture student who is currently in the third year of Ph.D studies is crossbreeding some selected populations of Black-chinned tilapia (*Sarotherodon melanotheron*) in Ghana. He envisages to produce a strain of *S. melanotheron* that would have high reproductive capacity, growth and survival rates in both brackish and freshwater environments. In this quarter, he has evaluated the appropriate concentration of 17α -Methyltestosterone that could effectively reverse the sex of female black-chinned tilapia and assessed sex conversion using both gonadal squashed and hand-sexing methods.

Still on the aquaculture front, a “comparative study on the biology of *Heterobranchus longifilis* and *Clarias gariepinus* in the Offin River; towards the culture of the former” is being conducted by an MPhil student inclined towards providing scientific data on the biology of *Heterobranchus longifilis* for culture purpose. The success of this study is based on the successful in vitro fertilization both species to be carried in the next quarter. The project intends to support these two researches until the end of FY 4 on the account that the relevance of this study in the aquaculture industry is appreciative considering the dwindling wild capture fisheries particularly in Ghana.



Figure 9: Postgraduate researcher takes measurements of catfishes in the Fisheries and Coastal Research Lab at DFAS, UCC

In the case of shellfish, some studies contributing to this activity include assessment and characterization of lobster (Palinuridae) fisheries in Ghana by a second year Ph.D student. Her research primarily aims to estimate some biological reference points (e.g. the maximum sustainable yield MSY, and the level of effort which will produce such yield [f_{MSY}]), and ascertain the socio-



Figure 10: Lobsters being assessed

economic importance of the fisheries. During this quarter, she has been able to identify major lobster business centres and some value chains through interviews and surveys. Further works including preparation of lobster gonads for histological study and assessment of stocks are scheduled for subsequent quarters.

Another study focusing on the fishery, aspects of the biology and culture of oyster (*Crassostrea tulipa*) at the Densu Estuary, in Ghana contributes to this activity. The study seeks to furnish stakeholders with necessary information on the current state of the fishery, biology and the right culture methods for the sustainable management of oysters at Densu Estuary. For this quarter, population density of oysters at the Densu Estuary were estimated and a comparative study on the performance of oysters grown by bottom and suspension cultures was conducted. Data collection for this research is expected to be completed in seven (7) months. The preceding research is complemented by an “Assessment of Water Quality of Some Selected Coastal Water bodies toward the Development of Oyster Culture in Ghana” by a female MPhil student in DFAS. The study focused on assessing the microbial load of the water and the oyster meat, determining the concentrations of some heavy metals in the water and sediments, and documenting some physico-chemical parameters of water bodies in the study areas.

There is also ongoing research led by DFAS to assess spatfall of oysters in four coastal waterbodies in Ghana as a precursor to potential large-scale oyster farming in Ghana. Significant progress has been made so far. By the end of the quarter under review, general trends in spatfall in the Whin Estuary, Benya Lagoon, Narkwa Lagoon and the Densu Delta areas over the period of October 2017 to March 2018 has been established, whilst research continues.

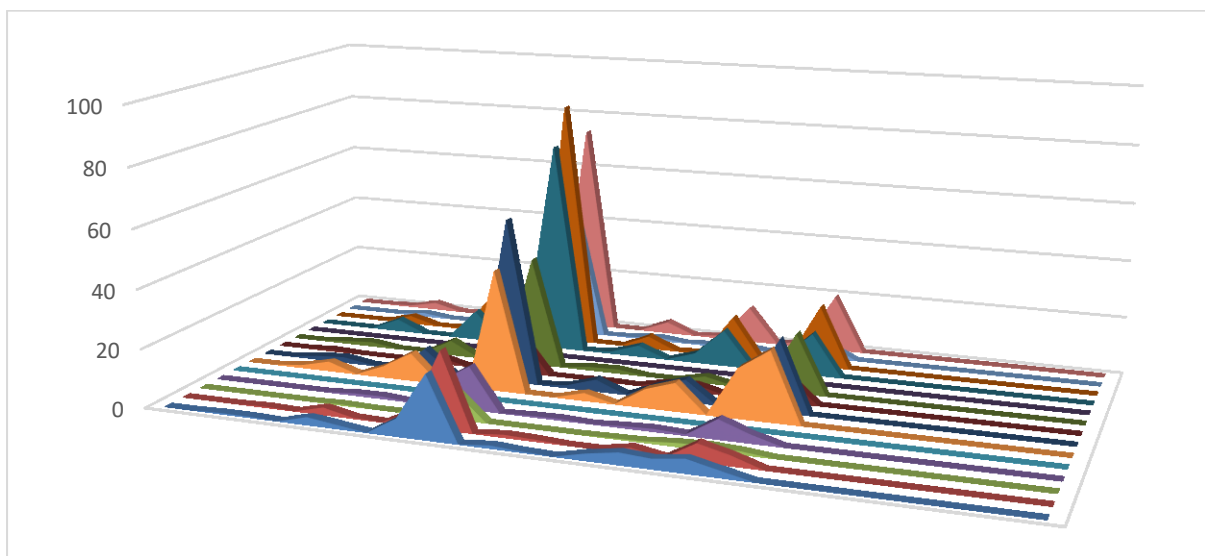


Figure 11: Preliminary assessment showing spatfall trend over six months

The study is expected to identify an overall strategy, providing scientific information on very efficient spat collectors and map localities within the selected coastal waterbodies for collecting optimum quantities of oyster seed for farming, and associated biofoulers.

5.4 Activity 2.1.4: Analysis of Value Chains of Fish Trade

In order to complement activities 2.1.1 and 2.1.3 the project commissioned this activity which is led by DFAS with active participation by students, Research Assistants and academic staff of the Department. So far, the project has relied on the data and information collected by a female PhD student currently working on the topic “Value Chain Analysis of Croakers (*Pseudotolithus* species) in Ghanaian Fishery”. The focus of the study is to assess the entire value chain of the croakers taking into consideration relationships at all stages of production, processing, trading and consumption of fish product. For outputs in this quarter, the researcher has assessed catch contribution in terms of quantities, sizes and pricing by the different sectors of the fishery, i.e. artisanal, semi-industrial and industrial. Also, the production costs of the various forms of processing- fried, smoked, salted, fillet etc., have been estimated. Interviews have also been conducted on the sources of finances available to actors along the value chain – this activity will be continued in the next quarter where triangulation will be done with the identified financial institutions to determine the actual situation on the ground. Also, in the next quarter further interviews will be conducted on actors’ knowledge of institutions responsible for working with fishers and fish traders in the Central and Western regions of Ghana to cover remaining constituencies.

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

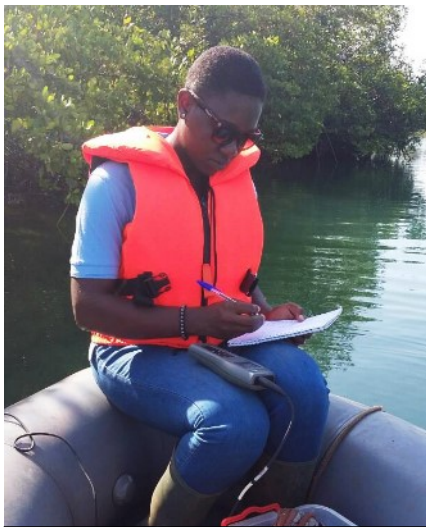


Figure 12: DFAS Postgraduate student assesses hydrography of coastal waterbodies

At the inception of the project, an external facilitator was engaged to lead implementation of this activity with the adoption of a lagoon (Awiane lagoon) in Half Assini. Premised on the workplan for FY 4, expression of interest was advertised during the first quarter of FY 4 requesting for a facilitator to use results obtained from monitoring the lagoon, to develop management strategies. Continuous work on the Awiane lagoon in FY 4 is however contingent on the availability of funds. This activity is nonetheless supported by M.Phil and Ph.D students who are conducting research on several coastal ecosystems. For the quarter under review, some studies under consideration include research by a female Ph.D student which aimed at developing a decision support system on coastal zone management options for urban marine space areas in Ghana. In her third year, the student has collected and identified biological data (i.e. zooplankton samples, bacteria colonies), conducted exploratory analyses for physicochemical data collected as well as conducted a land use assessment using drone imagery. This study is closely knitted with an MPhil study on the “characterization and quantification of marine litter at beaches within Central region, towards the management and proper disposal of waste in Ghana” with objective to establish trends in the types of debris, quantities and seasonality as well as determine the sources and driving

factors accounting for the beach litter. Information from both studies will feed into management policies for coastal development in Ghana.

Complementary to the preceding studies is the research of another Ph.D student with focus on “Sediment-water nutrient dynamics and biogeochemical models in selected coastal ecosystems in Ghana”. His work seeks to determine the productivity of selected lagoons and estuaries through nutrient inventories and primary production assessments. Peculiar to the quarter under review, he has estimated seasonal flux of nutrients within selected lagoons and estuaries for the dry season and expects complete replicate same the wet season in the next two quarters. He has also developed a conceptual framework for a dynamic model of coastal ecosystem processes. An actual modelling work will be carried out during the final year of study which is FY 5. Negotiations are underway by the student and supervisors for a collaboration with the Isotope Laboratory at the University of Konstanz in Germany to assess historical nutrient dynamics in selected coastal wetlands in Ghana using stable isotope techniques. This study has the advantage to explore the consequences of environmental change, and produce forecasts of future fluxes in coastal ecosystems in Ghana, and will be supported till the end of FY 5.

As part of a comprehensive coastal ecosystems monitoring objective of this project another Ph.D research has focused on investigating the functional feeding groups and habit trait groups in the selected coastal wetlands. This research is hinged on the philosophy of exploring the trait and feeding habit of macroinvertebrates as a basis for biological assessment of the ecological health of coastal wetlands. The aim is to develop a bio-indicator approach in water quality assessment of coastal water bodies. This study continues until the end of FY 4 with support from the project.

5.6 Activity 2.1.6: Developing Marine and Coastal Fisheries Database

By first quarter of FY 3, an online database was fully developed and functional to manage historical data, new field observations and experimental results on Ghana’s fisheries and other coastal resources. The database is called FishCoMGhana®, which can be accessed online via <http://fishcomghana.com>. In this quarter, the main activities done in respect to the database are routine editorial works and site management. In addition, fifty (50) titles from the previous quarter have been archived offsite in an excel file. Also, the action plan, as stipulated in the Project work plan, to embark on a nation-wide campaign to publicize usage and contribution of data to FishCoMGhana® was unsuccessful due to unavailability of funds. Project management hopes that funds will be available in subsequent quarters to see this activity through. Nonetheless, management wrote to the directorate of public affairs of UCC requesting permission to publicize the database on the local FM station-ATL FM.

In this quarter alone, i.e. for the period January 1st 2018 to March, 31st 2018, the site has received over 1200 visitors with 76 downloads (see Fig. 13)

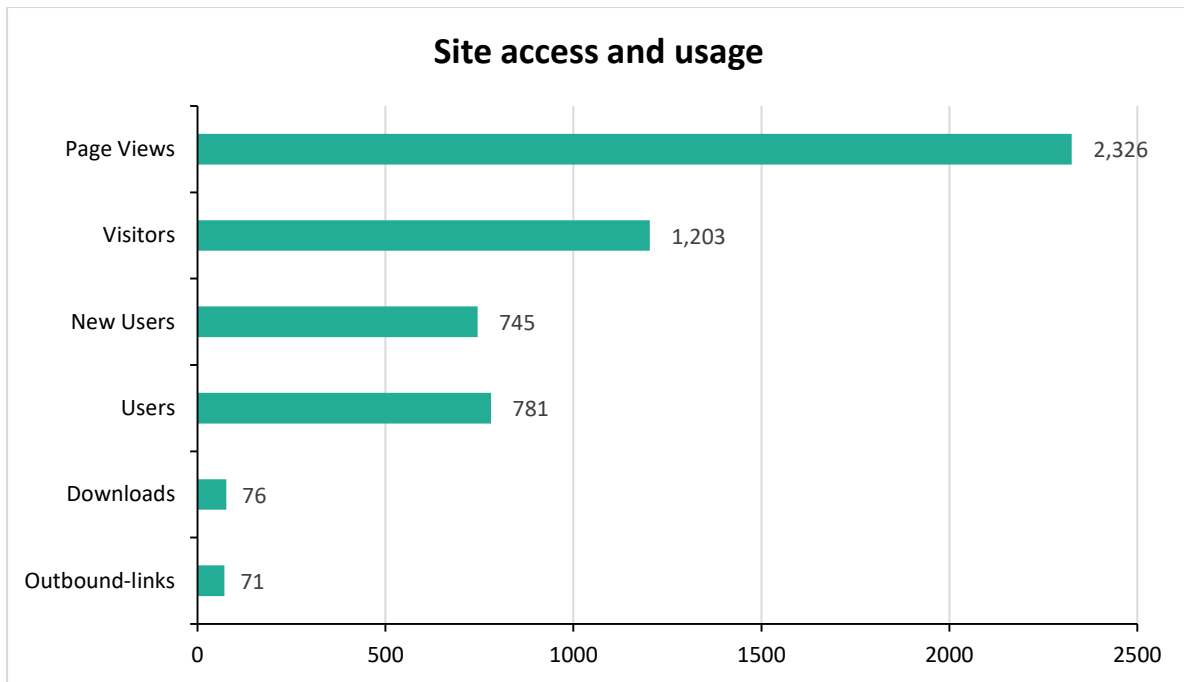


Figure 13: Site access and usage overview of the FishCoMGhana Portal

In terms of acquisitions by country, the site received over 300 users in Ghana, 100 users from the US, 46 and 19 from Indonesia and Morocco respectively (Fig. 14).

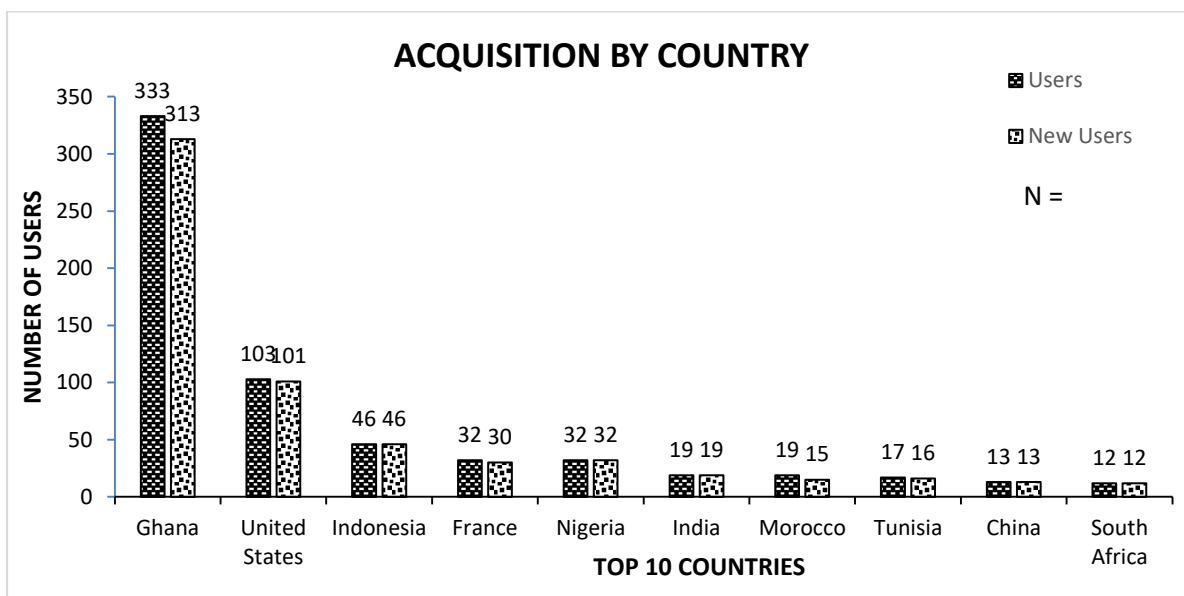


Figure 14: FishCoMGhana website acquisition by Country

It is interesting to note that in terms of age of users, the site is primarily accessed mostly by youth ranging between the ages of 18-34 years accounting for 63% of total users. These are expected to be mostly students or young career graduates. 3% of users came from age groups above 65 years.

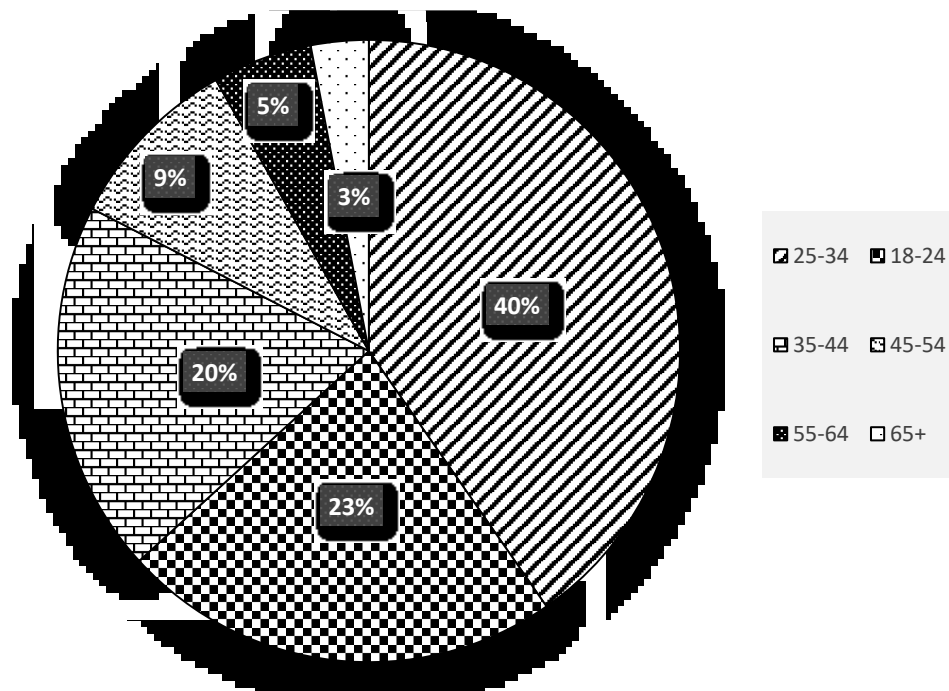


Figure 15: Age distribution of FishCoMGhana Portal users



Figure 16: Web banner of the Journal of Fisheries and Coastal Management established by CCM

A greater part of this quarter had been spent on developing framework, testing and validating the various stages of website development to host the Journal of Fisheries and Coastal Management (JFCoM). After several deliberations with the web developer and project management, a final product available at <http://jfc.com.fishcomghana.com> was agreed on and full manuscripts (of abstracts submitted for CFCE 2017) were called for publishing on the online journal. An interim editorial advisory board was constituted and editors have been successfully appointed from several institutions across the globe.

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

In the first quarter, the Project Management advertised a call for the expression of interest for individuals to facilitate the short courses on Integrated Coastal Management, Fisheries Management, Climate Change Adaptation and Mitigation and Geographic Information System. Following proposals received and interaction with the applicants, one facilitator was selected to facilitate the organization of all the short courses as well as deliver reports in Year 4. In this quarter, Project Management held a meeting with the facilitator to discuss modalities for organizing the short courses. Consensus reached from deliberations was that the short courses will be organized in June, September and October. In view of this development, steps were taken to book and secure training venues and accommodations on UCC campus, and advertise the courses through various outlets. A database of past beneficiaries, partners and collaborators was constructed and information on the courses shared with them through e-mails. Various forms of online advertisement campaigns were also employed. The choice of these training days and venues was to increase participation of a wide range of stakeholders to ensure the sustainability of the short courses.

Table 2: CCM Short Courses for 2018

Integrated Coastal Management	June 18 – 22, 2018
Introductory Geographic Information System	June 25 – 29, 2018
Climate Change Adaptation and Mitigation	September 17 – 21, 2018
Fisheries Management	September 24 – 28, 2018
Intermediate Geographic Information System	October 15 – 19, 2018

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

This activity has been scheduled to take place in the fourth quarter of Year 4 as indicated in activity 2.2.1.

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

This activity has been scheduled to take place in the fourth quarter of Year 4 as indicated in activity 2.2.1.

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

Trainings for this short course has been scheduled to run in the third quarter of Year 4 and first quarter of Year 5. See activity 2.2.1 for details

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

A major output of this activity in the second quarter is the development of the Journal of Fisheries and Coastal Management (JFCoM) which has been extensively described under activity 2.1.6

[Developing Marine and Coastal Fisheries Database] given that activity 2.1.6 is uniquely positioned to host the development of the journal.

6.6 Activity 2.2.6: Building Institutional Partnerships and Collaboration

The project through the Centre for Coastal Management has established a special linkage with the Department of Forensic Sciences of the University of Cape Coast and the Sustainable Fisheries Management Project (SFMP) to developed a guide on illegal fishing practices in Ghana. This activity commenced in the third quarter of FY 3 and was finalised in this quarter. A greater part of the quarter was focused on reviewing the final draft of the draft by the Centre for Coastal Management and Centre for Coastal Resource, University Rhode Island. The guide was developed to inform stakeholders in the fisheries industry, particularly, fisheries watchdogs, fisheries enforcement personnel and the marine police on how to detect fish obtained through illegal means. The development of the manual employed both qualitative (local knowledge) and scientific methods of detection. The qualitative approach used included key informants interviews and focus group discussion with fishers/processors, government and non-governmental institutions from the Central and Western Region of Ghana.

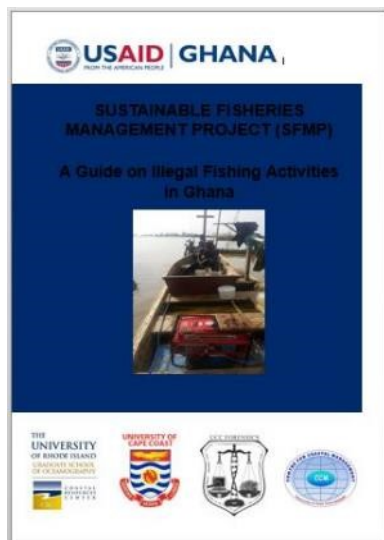


Figure 17: Front cover of forensic guide

The guide which describes what evidence one would need to collect, as well as how and what test would be needed to provide valid evidence in criminal cases against individuals using chemicals or other illegal methods in catching fish. It also highlights how fish samples are to be collected and preserved in the field, sent to accredited laboratories for scientific testing and how a chain of custody of such evidence needs to be documented for such samples to be used as evidence in a court of law. The manual also includes the laws that prohibit use of chemicals and other illegal fishing methods and penalties associated with use and/or possession of such illegal products. The guide is currently under review by fisheries stakeholders in the Centre for Coastal Resources (CRC), University of Rhode Island (URI).

Also in this quarter, the Project manager of the participated in a two-day workshop in Accra as an effort to build partnership with a consortium of academics from UK and West Africa. The British and West African academics are collaborating to prepare an interdisciplinary joint research bid targeted in expectation of the next relevant Global Challenges Research Fund (GCRF) call for research bids. Expectedly, expertise of the collaborators will be garnered to brainstorming ideas to create a Centre of West African Urban Research located at the Manchester School of Architecture. This Centre would collaborate and work directly with its African-based colleagues to develop a Centre of West African Urban Research located in West Africa run by African professionals, with strong collaboration links with Manchester. DFAS and CCM hopes to capitalise on this opportunity to establish linkages with other relevant institutions.



Figure 18: Lessons on oysters at the DAA office at Tsokomey

As part of community engagement, oyster pickers were supervised to collect data on some hydrographic parameters such as temperature, salinity, turbidity and pH with simple tools- digital thermometer, refractometer, Secchi disk and pH test strip respectively. Data was collected twice in a month following moon phases, i.e. full moon and half-moon. Data was collected based on tidal trends (low tide and high) for each moon phase. Two individuals of the data collection group started training

on data entering and analysis in excel. About 30 individuals of the DAA Oyster Pickers Association (DOPA) were taken through training on oyster culture. The training involved classroom session where participants went through basic oyster culture practices, culture methods and management. Result will feed into the Oyster management plan at the Densu delta.

In addition, CCM partnered the Department of Fisheries and Aquatic Sciences and Ainoo-Ansah Farms to showcase some of their innovations. Industry-Research Exhibition organized by the Directorate of Research, Innovation and Consultancy at the University of Cape Coast.



Figure 19: CCM, DFAS and Ainoo-Ansah Farms showcase products at Industry-Research Exhibition

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

The Wetlands Ecological Health Monitoring activity is implemented by the project in collaboration with some partner institutions including Friends of the Nation (FON), Hen Mpoano and Coastal Sustainable Landscape Project (CSLP) in the Western and Central regions of Ghana. This activity dwells heavily on the use of a coastal zone wetlands educational curriculum which was developed by DFAS to educate senior and junior high school level and undergraduate university level students on the nature, types and importance of wetlands, the ecological conditions, biodiversity and anthropogenic threats to coastal wetland habitats, and the techniques for monitoring the ecological health of wetlands.



Figure 20: JHS pupils take lessons on wetlands

In the foregoing quarter, an activity which was anchored by CSLP sought to provide heuristic experience for pupils of Yabiw Methodist Junior High School as part of their mandate for Wetland School Club in the Shama Constituency of the Western Region of Ghana. A field trip to the Fosu and Benya lagoons in the Central Region covered identification of threats to wetlands, identification of some wetland fauna and flora and a demonstration on how to measure some physicochemical parameters in aquatic systems. This activity is intended to educate existing schools in the Wetland School Club as well as introduce new schools to the club in subsequent quarters.

6.8 Activity 2.2.8: Strengthening Community-based Groups

This activity was merged into Activity 2.2.9

6.9 Activity 2.2.9: Promoting Supplementary Livelihoods in Coastal Communities

This is a flagship activity being undertaken by the project given its role in reducing pressure on fish utilization in coastal communities. Following from the strengthening of community-based groups to more effectively manage fish and other coastal resources, and to engage in supplementary livelihood activities, members from some selected coastal communities in the Western and Central Region have been given support to implement bee-keeping and snail farming as supplementary livelihoods. The four pilot communities engaged are Narkwa in the Central Region for snail farming, Anlo Beach in the Western Region for bee-keeping, Ankobra in the Western Region for snail farming and Half Assini in the Western Region for both beekeeping and snail farming. Demonstration sites were set up in the selected communities for this exercise.

In Year 3, Project Management made a decision to provide support to individual community members to set up their own farms after receiving training from the demonstration farms. Interested and committed community members were identified to receive support from the project to operate their own farms where activity facilitators were asked to prepare and present financial statements to support their implementation. The financial statements and other logistics have been assessed to kick-start activity. Nonetheless, its implementation has delayed due to unavailability of funds.

APPENDICES

Appendix 1: Application form for DFAS Undergraduate student exchange programme



USAID
FROM THE AMERICAN PEOPLE



USAID/UCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING
SUPPORT PROJECT

STUDENT EXCHANGE PROGRAMME (J-TERM) APPLICATION FORM

PLEASE COMPLETE FORM IN BLOCK LETTERS

ABOUT THE PROGRAMME:	
<p>The Department of Fisheries and Aquatic Sciences of the University of Cape Coast, through the USAID/UCC Fisheries and Coastal Management Project, is collaborating with the University of Rhode Island is organising the maiden edition of a 2-week fully sponsored summer student exchange programme at the University of Rhode Island, USA. The exchange programme seeks to enhance the academic knowledge of participating students in global fisheries and coastal resource management issues whilst deepening their appreciation to a multi-disciplinary and cross-cultural perspective to these issues.</p>	
[REDACTED]	
Surname	
First Name	
Other Names	
Date of birth (DD-MM-YYYY)	
Nationality	
Gender	
Home address	
Email	
Phone number	
Do you have a relative in the USA?	YES NO
[REDACTED]	
Programme of Study	
Registration Number	
Level	
Current CGPA	
[REDACTED]	
Passport No. (if already available)	

Motivation letter	Please provide as an attachment
Police report (if already available)	Please provide as an attachment

NB: All selected applicants will require passports and police report

List of Project Performance Indicators and FY 2018 Second Quarter Results

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	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: Periodic stock assessment surveys conducted provide information and data for this custom indicator. The nature of the indicator makes it difficult to set baselines, annual targets and performance achieved in a particular reporting period which means results shown by this indicator could only be descriptive. The last fish stock assessment conducted by the project in FY 2017 indicated that quantities of fish landed by canoe fishermen have shown a gradual decline since 1986 mainly due to increase in fishing effort during the period. The assessments also showed that there is growth overfishing which is confirmed by lower modal sizes of fish landed.</p>							
2	Fishing Mortality at MSY (F_{msy})	-	-	-	-	-	-
<p>Comments: This is a custom indicator of the USAID/Ghana Sustainable Fisheries Management Project (SFMP) which is only tracked by the USAID/UCC Fisheries and Coastal Management Capacity Building Project. In 2014, the SFMP estimated Fishing Mortality at MSY (F_{msy}) to be 0.74 which was higher than the preferred Fishing Mortality at MSY (F_{msy}) of 0.40. In FY 2017, the SFMP reported Fishing Mortality at MSY (F_{msy}) to be 0.30 which indicates an increase in fishing mortality and a severe decline in population size. Current fishing effort is well beyond the level of sustainability for the small pelagic stocks.</p>							
3	Biomass to produce MSY (B_{msy})	-	-	-	-	-	-

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
<p>Comments: This is also a custom indicator of the USAID/Ghana Sustainable Fisheries Management Project (SFMP) which is only tracked by the USAID/UCC Fisheries and Coastal Management Capacity Building Project. In 2014, the SFMP estimated Biomass to produce MSY (B_{msy}) to be 182,726 tonnes which was less than the preferred Biomass to produce MSY (B_{msy}) of 310,476 tonnes. In FY 2017, the SFMP reported Biomass to produce MSY (B_{msy}) as 30,000 tonnes. Current estimated biomass is much lower than those estimated in 2014. This suggests diminishing economic returns.</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	6.9	0	0	No
<p>Comments: In Year 3, the project concluded research on the ecological conditions and the overall health status of the <i>Awiane</i> lagoon at Half Assini in the Western Region in order to acquire a more comprehensive baseline data on the lagoon for improved management. In the quarter under review, the project initiated discussions with an external facilitator to lead the work with the community and their traditional authorities as well as the District Assembly to put the lagoon and its associated wetland area under improved management.</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	6.9	0	0	No

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
<p>Comments: In Year 3, the project concluded research on the ecological conditions and the overall health status of the <i>Awiane</i> lagoon at Half Assini in the Western Region in order to acquire a more comprehensive baseline data on the lagoon for improved management. In the quarter under review, the project initiated discussions with an external facilitator to lead the work with the community and their traditional authorities as well as the District Assembly to put the lagoon and its associated wetland area under improved management. Areas in hectares of the lagoon and wetlands showing improved biophysical conditions will be determined as work progresses.</p>							
6	Number of training and capacity building activities conducted with USG assistance	0	40	10	0	0	Yes
<p>Comments: No training and capacity building activities took place in the quarter under review but preparations for capacity building activities were initiated. Training and capacity building activities are planned to begin in the next quarter.</p>							
7	Number of people receiving USG supported training in natural resources management and/or biodiversity conservation	0	250	100	0	0	Yes
<p>Comments: One-hundred (100) training participants have been targeted to benefit from natural resources management and/or biodiversity conservation training in FY 2018. None of those training activities occurred in this reporting period but preparations towards the trainings were initiated to begin in the next quarter.</p>							

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
8	Number of person hours of training in natural resources management and/or biodiversity conservation supported by USG assistance	0	15000	3000	0	0	Yes
<p>Comments: 3000 hours of training in natural resources management and/or biodiversity conservation has been targeted for FY 2018. None of those training activities occurred in this reporting period. Number of person hours of training will be calculated when the training activities begin in the next quarter.</p>							
9	Number of individuals who have received USG supported long-term agricultural sector productivity or food security training	0	40	35	35	100	Yes
<p>Comments: Thirty-five (35) students received USG supported long-term agricultural sector productivity or food security training in this reporting period, 11 males and 24 females.</p>							

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
10	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	0	250	80	0	0	Yes
<p>Comments: Eighty (80) people have been targeted to receive USG supported short-term agricultural sector productivity or food security training in 2018. None of such trainings took place in this reporting period. The trainings are scheduled to begin in the next quarter.</p>							
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	5	5	100	Yes
<p>Comments: Five (5) community-based organizations (CBOs) received technical assistance in supplementary livelihood activities (snail farming and bee-keeping) in 4 selected coastal communities in the Western and Central region of Ghana in this reporting period.</p>							

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
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	10	4	4	100	Yes
<p>Comments: Four (4) Community-Based Organizations (CBOs) that received technical assistance in supplementary livelihood activities applied new management practices in bee-keeping and snail farming in this reporting period.</p>							
13	Number of members of producer organizations and community based organizations receiving USG assistance	0	200	100	80	80	Yes
<p>Comments: One-hundred (100) members have been targeted to receive assistance in FY 2018. Eighty (80) members in total belonging to the 4 Community-Based Fisheries Management Groups (CBFMGs) formed in 4 selected fishing communities received technical assistance in supplementary livelihoods activities (snail farming and bee-keeping) by the project in the period under review.</p>							

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
14	Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	0	200	100	80	80	Yes
Comments: Eighty (80) members of the 4 Community-Based Fisheries Management Groups (CBFMGs) formed in 4 selected fishing communities applied new management practices in snail farming and bee-keeping in the quarter under review.							
15	Number of rural households benefiting directly from USG interventions	0	200	100	80	80	Yes
Comments: Eighty (80) rural households benefited directly from project interventions through supplementary livelihood support in snail farming and bee-keeping in the period under review.							
16	Score, in percent, of combined key areas of organization capacity amongst USG direct and indirect local implementing partners	-	95	-	80.13	80.13	Yes

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
<p>Comments: AfricaLead conducted an Organizational Capacity Assessment 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% as the combined key areas of organization capacity. Future scores will be determined after the next Organizational Capacity Assessment is conducted.</p>							
17	Number of beneficiaries receiving improved infrastructure services due to USG assistance	0	150	150	121	80	Yes
<p>Comments: One-hundred and twenty-one (121; 82 males and 39 females) people made up of 11 senior staff members, 6 Research Assistants, 5 Administrative staff, 8 Technical staff, 41 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 period.</p>							
18	Number of new research collaborations established between USG-supported beneficiaries and other institutions	0	10	5	1	20	Yes
<p>Comments: One (1) new research collaboration in Aquaculture was established between the project and a Danish institution in this reporting period.</p>							

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
19	Number of scientific studies published or conference presentations given as a result of USG assistance for research programs	0	10	5	0	0	Yes
Comments: No scientific studies were published or conference presentations given as a result of USG assistance for research programs in this reporting period.							
20	Number of dialogues and stakeholder consultations held on fisheries and coastal management	0	20	3	0	0	Yes
Comments: No dialogues and stakeholder consultations were held on fisheries and coastal management in this reporting quarter.							
21	Percentage of graduates from USG-supported tertiary education programs employed	0	50	5	1	20	No
Comments: One (1) DFAS graduate was employed by the Environmental Justice Foundation to engage in marine fisheries research work in this reporting period. Some MPhil students trained by the project have graduated but no PhD student has yet graduated. This presents an opportunity for some of the graduates to be employed either by the Centre for Coastal Management or DFAS or by other organizations.							

No.	Indicator	Baseline	Life of Project (LOP) target	Annual target	Performance achieved in reporting period (actual)	Performance achieved in reporting period (%)	On target? Yes/No
22	Number of CSOs and government agencies strengthened	0	25	25	0	0	Yes
<p>Comments: Representatives of CSOs and government agencies are strengthened through their participation in the GIS, Fisheries Management, Climate Change and Integrated Coastal Management short courses. None of those short courses took place in this reporting period. Number of CSOs strengthened will be determined after organization of the short course.</p>							
23	Total number of direct beneficiary						
<p>Comments: Two-hundred and one (201) people benefitted directly in various ways as indicated above from project interventions in this reporting period.</p>							

