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**UNIVERSITY OF  
CAPE COAST**

**USAID/UCC FISHERIES AND COASTAL MANAGEMENT  
CAPACITY BUILDING SUPPORT PROJECT**

**YEAR FOUR**  
**3RD QUARTER REPORT**

1ST APRIL – 30TH JUNE, 2018

DEPARTMENT OF FISHERIES AND AQUATIC SCIENCES  
UNIVERSITY OF CAPE COAST

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**Cover Photo:** Deputy Director of the USAID/Ghana Economic Growth Office in a group photograph with the PROVOST of CANS

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## LIST OF ABBREVIATIONS

CANS	College of Agriculture and Natural Sciences
CCM	Centre for Coastal Management
CDCS	Country Development Cooperation Strategy
CSLP	Coastal Sustainable Landscape Project
DFAS	Department of Fisheries and Aquatic Sciences
EGO	Economic Growth Office
FfD	Fish for Development Project
FtF	Feed the Future
GC	Gas Chromatographic Unit
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GMMB	Ghana Museums and Monuments Board
JFCoM	Journal of Fisheries and Coastal Management
M&E	Monitoring and Evaluation
MoFAD	Ministry of Fisheries and Aquaculture Development
PMP	Performance Management Plan
<i>RV</i>	Research Vessel
SBS	School of Biological Sciences
SFMP	Sustainable Fisheries Management Project
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 is faced with a consistent decline in national output of its fish stocks. While at this, the country is equally confronted with increasing national fish consumption deficit resulting in higher importation of fish and fishery products. Over-exploitation of marine fish stocks is as a result of weak enforcement of fisheries Laws and Regulations, inadequate fishing infrastructure, weak collaboration with communities in the management of fisheries resources, inadequate supply of fishery inputs, inadequate skilled labour in the fisheries industry, weak institutional capacity to implement Government policy initiatives in the fisheries sector. The USAID funded Fisheries and Coastal Management Capacity Building Support Project was awarded to the Department of Fisheries and Aquatic Sciences (DFAS) of the University of Cape Coast (UCC) on the 24<sup>th</sup> October 2014 to address some of these critical challenges through capacity building for the sector. This report provides an update on the third quarter activities of Year 4 covering the period 1<sup>st</sup> April – 30<sup>th</sup> June, 2018. Principal activities reported on include the receipt of new equipment (Gas Chromatography unit) to augment the equipment base of the Fisheries and Coastal Research Laboratory; strengthened institutional partnership of the project with the Ministry of Fisheries and Aquaculture Development (MoFAD) through its involvement in the preparatory process of the Norwegian funded Fish for Development (FfD) Project. The working visit of USAID/Ghana Economic Growth Office Deputy Director, James Lykos and the Activity manager, Ms. Suzan Bonney was a key event. This meeting with university and project administrators as well as students discussed technical and managerial issues of implementation of project activities. The Project also participated in the Feed the Future Annual Implementing Partners Meeting during the quarter. A major activity related to the support received by the undergraduate and postgraduate students in terms of their supervision to attain advanced stages of their studies and research.

## **1.0 INTRODUCTION**

### **1.1 Ghana's Marine Fisheries Sector**

Available fisheries statistics data show that the 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 in Ghana. 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. Indeed capacity building is an enabling condition for improved fisheries management across the world. The justification for the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project is grounded on this premise. The primary aim of the project is to promote sustainable marine fisheries management in Ghana through capacity building actions involving 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 of the American Government and also 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, the United States Government 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 program 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, which 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 operational. 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 various 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 relating to 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 support services to help 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 as well as 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.



*Figure 1: Members of DFAS Academic Staff*

Through the project, the capacity of DFAS has been strengthened 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 provided 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

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

### 2.1 Activities Completed in the Third Quarter

#### *Key Activities Completed within the Third Quarter:*

- ✓ Submission of a completed project report covering activities undertaken during the second quarter of FY 4.
- ✓ Project hosted Activity manager, Ms. Suzan Bonney, on a working visit
- ✓ USAID/Ghana Economic Growth Office Deputy Director, James Lykos visited the project
- ✓ Project management attended the Feed the Future Annual Implementing Partners Meeting
- ✓ One project staff represented Ghana (CCM) at the UNESCO World Heritage Young Professionals Forum 2018, held in the Kingdom of Bahrain, presenting the case of harnessing heritage for fisheries and coastal resource conservation – the Case of Fort St. Jago, Elmina
- ✓ DFAS Fisheries and Coastal Research Laboratory took delivery of a Gas Chromatography laboratory equipment
- ✓ Institutional partnership and collaboration with the MoFAD was entrenched through the selection of the Project Manager to be part of the Ghana delegation to Norway in a preparatory process of the Norwegian funded Fish for Development (FfD) Project
- ✓ DFAS Research Lab supported undergraduate students to successfully complete their project works

### 2.2 Project Management and Finances

USAID/UCC Fisheries and Coastal Management Capacity Building Support Project was present at the Feed the Future Implementing Partners Meeting. At the meeting DFAS was highlighted as one of the FtF successes. Focus was on the number of graduate students receiving support through grants and fully funded scholarships at the Department of Fisheries and Aquatic Sciences at the University of Cape Coast. During a discussion on gender, Project Manager (Prof Denis Aheto) shared light on how the Department is encouraging women in their application process by the

introduction of a “catch-phrase” in advertisements, which has led to very brilliant but needy women studying on full scholarships at DFAS. Key discussion points included Project closeout noting the need to i) read carefully Project Award and outline activities and requirements/provisions, ii) address all financial recommendations – reporting, auditing address all audit issues if any, iii) Communications – plan closeout events, have strategy, and involve USAID DOCS. Early initiation of project closeout was noted.

In the same quarter, Deputy Director of the USAID/Ghana Economic Growth Office (EGO) visited the University of Cape Coast’s USAID/UCC Fisheries and Coastal Management Capacity Building Support Project where he paid a courtesy call on the Provost of the College of Agriculture and Natural Sciences (CANS) and the Dean of the School of Biological Sciences (SBS). During his visit, he was welcomed and introduced to the Dept. of Fisheries and Aquatic Sciences Project (DFAS) Team and briefed on academic, research, and extension activities ongoing at DFAS. He was also engaged in a discussion on Ghana’s fisheries sector and CCM’s role after which he took time to meet students/tour laboratory.



*Figure 2: Deputy Director of the USAID/Ghana Economic Growth Office interacts with DFAS PhD students in the laboratory*



*Figure 3: Deputy Director of the USAID/Ghana Economic Growth Office in group photographs with the PROVOST of CANS (left) and some DFAS postgraduate students (right)*

In terms of financing, the project suffered setbacks in view of limited financial remittances from USAID in FY4 which affected some key project activities mainly the extension policy and



governance programs and short courses. It is the view of project management to propose a no-cost extension to USAID in the fifth year to enable the university to complete all set activities outlined in the project description.

### 2.3 Monitoring and Evaluation (M&E)

During the quarter under review, the Project was paid a visit by the Activity Manager. Through the period of the working visit, Ms. Suzan Bonney held series of meetings with project management and students of DFAS who are on funding support from the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project. Meeting with students sought to understand activities being undertaken under their various research programmes as well as discussed their challenges and successes chalked so far.



*Figure 4: Ms. Suzan Bonney with DFAS postgraduate scholarship students*

### 2.4 Project Communications

Project communications materials (Project Brief, DFAS flyers, CCM flyers, manuals for CCM short courses, Postgraduate Research Report, Technical Reports) were exhibited at a parallel session of the FtF IPs Meeting. Discussion was initiated for training on 508 Compliance regarding the upload of reports onto ghanalinks.org. Lesson learnt was the need to produce more materials to communicate especially successes chalked by the project. Uploading of project documents to the ghanalinks portal continued.

The second quarter report for FY 2018 covering the period from 1 January – 31 March 2018, was successfully compiled and submitted to USAID within the first month of this reporting quarter.



*Figure 5: Cover of 2nd Quarter Report*

Within the Quarter, meetings were held with journalists from some media houses to explore opportunities for publicizing Project outcomes and CCM short courses.



Figure 6: Online banner showing DFAS student activities designed for DFAS Facebook wall

### 3.0 PROJECT OUTPUT 1.1: IMPROVED INFRASTRUCTURE

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

Gas chromatography laboratory equipment was delivered to the DFAS Fisheries and Coastal Research Laboratory. This follows several months of hanging at the port, over clearance tax waiver.

With respect to research vessel *RV Sardinella*, vessel use application forms were submitted to the Head Office of Ghana Maritime Authority, Ridge awaiting an inspector from GMA to inspect the boat on campus.

#### 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

In the quarter under review, USAID/Ghana embarked on a journey to develop its staff, implementing partners and key stakeholders including government, civil society and private sector partners to improve effectiveness and efficiency in achieving Ghana's development outcomes. These efforts will support Ghana's vision to move beyond aid and USAID's commitment to end foreign assistance. The workshop focused on building principle-centred leadership using tools and methods created by Stephen Covey in his book: "The 7 habits of highly effective people". The 7 Habits represent a proven process of internal and external growth that will have an immediate and lasting impact on an individual's personal and professional life. Project Manager and Project Support Staff benefitted from the training.

It is the intention of the Project to extend invitation to USAID to support the UCC Project office and its staff with similar training in the 5<sup>th</sup> Year of project timeline.



*Figure 7: Participants at the leadership workshop*

### 4.2 Activity 1.2.2: Operationalization of the Centre for Coastal Management

#### *Fort St. Jago*

A major activity of the Centre is the search for a location in the coastal communities from where the Centre could operate. CCM 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.

During her working visit to the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project, Ms. Suzan Bonney, in the company of the Project Manager and other



persons including the M&E Support and College Accountant (CANS), visited Fort St. Jago in Elmina to familiarize with the fort and have a fore sight of the facility intended for CCM's community/satellite office.



*Figure 8: Ms. Suzan Bonney and the Project team at the forecourt of Fort St Jago, Elmina*

In the last quarter, one Project Staff was invited as one of thirty delegates to the UNESCO World Heritage Young Professionals Forum, 2018, held at Manama, Kingdom of Bahrain. He presented the case of harnessing the potential of World Heritage Sites, for the conservation and protection of other natural heritage such as fisheries and coastal resources (See poster in Appendix 1). A typical example of the project CCM seeks to achieve through Fort St. Jago, which is listed as UNESCO World Heritage Site but without any proper management.



*Figure 9: Ernest Chuku makes a presentation (left) to participants (right) at the UNESCO World Heritage Young Professionals Forum*

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

The Project set out to train thirty postgraduate students comprising twenty (20) MPhil and ten (10) PhD students. To date, all 30 including an additional six (6) (partially funded) PhD students have been supported by the Project in the areas of tuition and research, adding up to a total of 36, out of which five (5-MPhils) have successfully graduated. The last graduation was that of Ms. Pearl Sakyi-Djan on 2 June 2018. Of the remaining thirty-one (31), twenty-six (26) comprising 10 MPhils and 16 PhDs received support to complete various stages of their research within the third quarter of FY 18. The other five (5) are just about beginning their MPhil thesis research.

In addition, one (1) PhD student who was supported to travel to URI on a semester abroad to study has returned to the country. As part of activities undertaken while URI, she studied the



*Figure 10: DFAS P.hD student at a conference at URI*

principles and policy process in coastal governance by taking courses such as Coastal Ecosystem Governance and Marine Pollution Policy. She also explored appropriate software/tools for data analyses and thus improved her skills in sample handling and treatment for laboratory testing. The student is expected to apply knowledge gleaned from the experience in completing her thesis and supporting coastal management initiatives in Ghana.

It is the earnest expectation of the project to see a number of students graduate by the end of the 2017/2018 academic year. Currently, the theses of two MPhil students are undergoing external examination. A list of all students supported by the project is presented in Table 1. The table provides an overview to include those who have successfully completed and current students.

Table 1: List of Current USAID funded Postgraduate Students at the Department of Fisheries and Aquatic Sciences of the University of Cape Coast

NB		Postgraduate study completed (graduated)	Completed 4 months study at URI in December 2017				Starting 4 months study at URI in September 2018			
No.	Name of Student	Programme of Study	Level	Status	Start Date	Completion Date	Funding	Principal Supervisor	Co-Supervisor(s)	
1	Pearl Sakyi Djan	Fisheries Science	MPhil	Completed	2014/15	Nov. 2017	Full	Prof. Joseph Aggrey-Fynn	Dr. Najhi Lazar	
2	Elsie Akusika Debrah	ICZM	MPhil	Completed	2014/15	Jun. 2017	Full	Prof. Denis. W. Aheto	Prof. George Wiafe	
3	Prince Dela Tseku	Aquaculture	MPhil	Completed	2014/15	Dec. 2016	Full	Prof. Kobina Yankson	Dr. Emmanuel Acheampong Mr. Jacob Ainoo Asah	
4	Bright Asare	Aquaculture	MPhil	Completed	2014/15	Jun. 2017	Full	Prof. Edward A. Obodai	Dr. Emmanuel Acheampong	
5	Daniel Agyei	ICZM	MPhil	Completed	2014/15	Jun. 2017	Full	Prof. Denis. W. Aheto	Prof. George Wiafe	
6	Divine Worlanyo HOTOR	Fisheries Science	MPhil	Due	2015/2016	Sep 2017	Full	Prof. Joseph Aggrey-Fynn	Prof. John Blay	

7	Jennifer ESHILLEY	ICZM	MPhil	Due	2015/2016	Sep 2017	Full	Prof. Denis. W. Aheto	Dr. Noble K. Asare
8	Kezia BAIDOO	Fisheries Science	MPhil	Due	2015/2016	Sep 2017	Full	Prof. John Blay	Dr. Noble K. Asare
9	Mercy JOHNSOM-ESHUN	Aquaculture	MPhil	Due	2015/2016	Sep 2017	Full	Prof. Kobina Yankson	Dr. Emmanuel Acheampong
10	Simon Kyei GYIMAH	Aquaculture	MPhil	Due	2015/2016	Sep 2017	Full	Prof. Edward A. Obodai	Dr. Emmanuel Acheampong
11	Lawrence Armah AHIAH	Aquaculture	PhD	Due	2015/2016	Sep 2018	Full	Prof. John Blay	Prof. Kobina Yankson
12	Michelle N. Kordei CLOTTEY	Fisheries Science	PhD	Due	2015/2016	Sep 2018	Full	Prof. Joseph Aggrey-Fynn	Prof. John Blay
13	Jemimah Etornam KASSAH	Fisheries Science	PhD	Due	2015/2016	Sep 2018	Full	Prof. John Blay	Dr. Najih Lazar
14	Rebecca K ESSAMUAH	ICZM	PhD	Due	2015/2016	Sep 2018	Full	Prof. Denis Aheto	Dr. Emmanuel Acheampong
15	Margaret F. A. DZAKPASU	Oceanogr. & Limnol.	PhD	Due	2015/2016	Sep 2018	Full	Prof. Kobina Yankson	Dr. Emmanuel Lamptey

16	Success Adjeley SOWAH	Oceanogr. & Limnol.	MPhi 1	3 <sup>rd</sup> Year	2016/2017	Sep 2018	Full	Prof. Kobina Yankson	Dr. Noble K. Asare
17	Paulina OKEH	Fisheries Science	MPhi 1	3 <sup>rd</sup> Year	2016/2017	Sep 2018	Full	Prof. Joseph Aggrey-Fynn	Dr. Isaac Okyere
18	William DOGAH	Aquaculture	MPhi 1	3 <sup>rd</sup> Year	2016/2017	Sep 2018	Full	Prof. Edward A. Obodai	Dr. George Darpaah
19	Nunana AGBEMEBISE	ICZM	MPhi 1	3 <sup>rd</sup> Year	2016/2017	Sep 2018	Full	Prof. Denis Aheto	Prof. John Blay
20	Justina Ekuwa ANNAN	ICZM	MPhi 1	3 <sup>rd</sup> Year	2016/2017	Sep 2018	Full	Prof. Denis Aheto	Prof. Edward A. Obodai
21	Fredrick Ekow JONAH	Oceanogr. & Limnol.	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Full	Dr. Noble K. Asare	Dr. Emmanuel Acheampong
22	Miriam Y. AMEWORWOR	Fisheries Science	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Full	Prof. John Blay	Prof. Joseph Aggrey- Fynn
23	Rhoda Lims Osae SAKYI	Aquaculture	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Full	Prof. Kobina Yankson	Dr. Mike Osei-Tweneboa
24	Gertrude Lucky Aku DALI	ICZM	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Full	Prof. Denis Aheto	Prof. John Blay

25	Lesley NTIM	ICZM	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Full	Prof. John Blay	Dr. Denis W. Aheto
26	Elizabeth EFFAH	ICZM	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Part	Prof. Denis Aheto	Dr. Emmanuel Acheampong
27	Sheila FYNN-KORSAH	Fisheries Science	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Part	Prof. Joseph Aggrey-Fynn	Dr. Najih Lazar
28	Ebenezer Delali KPELLY	Fisheries Science	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Part	Prof. John Blay	Prof. Joseph Aggrey-Fynn
29	Ramat Quaigrane DUKER	Oceanogr. & Limnol.	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Part	Dr. Noble K. Asare	Prof. Edward A. Obodai
30	Isaac Kofi OSEI	Fisheries Science	PhD	3 <sup>rd</sup> Year	2016/2017	Sep 2019	Part	Prof. Kobina Yankson	Prof. Edward A. Obodai
31	Alberta JONAH	ICZM	PhD	2 <sup>nd</sup> Year	2016/2017	Sep 2019	Part	Prof. Denis Aheto	Dr. Isaac Okyere
32	Gabriel Gator	Fisheries Science	MPhil	2 <sup>nd</sup> Year	2017/2018	Sep 2019	Full	Prof. John Blay	Prof. Kobina Yankson
33	Bernard Assiam	ICZM	MPhil	2 <sup>nd</sup> Year	2017/2018	Sep 2019	Full	Prof. Denis Aheto	Dr. Isaac Okyere



34	Delove Asiedu Abraham	Oceanogr. & Limnol.	MPhil	2 <sup>nd</sup> Year	2017/2018	Sep 2019	Full	Dr. Noble K. Asare	Dr. Emmanuel Acheampong
35	Grace Olai	Aquaculture	MPhil	2 <sup>nd</sup> Year	2017/2018	Sep 2019	Full	Prof. Kobina Yankson	Prof. Edward A. Obodai
36	Eugenia Amador	Fisheries Science	MPhil	2 <sup>nd</sup> Year	2017/2018	Sep 2019	Full	Prof. Joseph Aggrey-Fynn	Prof. John Blay

#### 4.4 Activity 1.2.4: Undergraduate Research Grants

The quarter under review saw the final submission and successful completion of project works of level 400 undergraduate students of DFAS. Twenty-seven undergraduate students conducted researches in various areas of fisheries and coastal management as part of their final year project. Project topics were selected within the broad thematic areas of the USAID/UCC Fisheries Project.

*Table 2: L400 PROJECT RESEARCH TOPICS (2017/2018)*

Lecturer	Project Title	No. of Students	Name of Student
Prof. Denis Aheto	Governance of the oyster fishery in the Densu Delta of Ghana	1	Omane Maxwell
	Valuation of the oyster fishery in the Densu Delta of Ghana	1	Korang Richmond
	Socioeconomic implications of foreign direct investments in aquaculture on indigenous fish farmers in Ghana	1	Esther Acheampong
Prof. John Blay	Aspects of the Biology of the blackchinned tilapia <i>Sarotherodon melanotheron</i> in three floodplain pools of the Kakum River estuary	1	Yeboah Michael
	Plankton community and productivity in three floodplain pools of the Kakum River estuary.	1	Opoku Martin
Dr. Emmanuel Acheampong	Morphological adaptation of <i>Crassostrea tulipa</i> from two contrasting habitats	1	Davies Evans
	Phytoplankton and zooplankton composition in the Ankobra River Estuary	1	Bentum Nana Justice
	Laboratory culture and alimentation of marine fish	1	Timothy K. D. Amuah
Dr. Noble Asare	Evaluating the ecological health of Fosu lagoon: from the perspective of organic matter and nutrient loads	2	Ahiati Fred Kwaku Takyi Gabriel
	Anthropogenic perspective to pollution of a coastal lagoon in the Central Region of Ghana	1	Bog-Yena Martin K.
Prof. Joseph Aggrey-Fynn	Studies on blackchinned tilapia in Fosu, Benya and Brenu Lagoons	1	Odjelua Solomon Tetteh
	Studies on various marine fish species that enter Kakum estuary	1	Gyimah S. David
	Biological studies on grey mullets in Benya Lagoon and Kakum estuary.	1	Abarike A. James
Prof. Kobinah Yankson	Studies on condition index and reproductive status of mangrove oysters	2	Mohammed Alhassan K
			Ofosuhene Williams

	Studies on morphometric parameters of mangrove oysters	1	Mercy Sekum
Mr. Joseph Debrah	Length-weight relationships of <i>Sarotherodon melanotheron</i> in an estuarine system	1	Morris Isaac
	The CPUE of <i>Oreochromis niloticus</i> in the Kakum lake, Brimso	1	Ofosu Emmanuel Sandy
	Length-weight relationships of three crustaceans species in the Kakum lake, Brimso	1	Juliet Obeng Afrah
Dr. Isaac Okyere	Investigations on the spawning habits, embryonic development and diapause periodicity of the banded lampeye killfish <i>Aplocheilichthys spailauchen</i>	1	Juliet Obeng Afrah
	Relationship between the size of arborescent organ of mudfish and length of survival period out of water	1	Edna Arthur
	Synergies between scientific and fishermen's traditional knowledge in interpretation of fisheries related climatic, oceanographic and biological processes.	1	Boakye Daniel
	Experiments on the hatching rate and post-hatching food alternatives for survival of cuttlefish <i>Sepia hierredda</i> .	1	Siba Maswoud
Prof. Edward Obodai	Effect of copepod infestation on the gill volume of the gar fish	1	Nutsugah S. Derek
	Sex ratio and condition index of the mangrove oyster in the Benya Lagoon	1	Kwadwo A. Baah
	Sex ratio and condition index of the mangrove oyster in the Nakwa Lagoon.	1	Richmond Asante
	<b>Total Number of Students</b>	<b>27</b>	

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

### 5.1 Activity 2.1.1: Conducting Fisheries Stock Assessment

The objective of this activity is 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. Research for the last three years focused on determining the status of important fish species including cuttlefish, shrimp, *Carangidae* and Sparidae. 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. However, from the beginning of Year 3, post-graduate students in DFAS

were implemented this activity with the support of academic and technical staff. In the third quarter of year 4 two female students led this activity.

As part of a PhD research, a student studied the bottom set gillnet fishery in the Central region of Ghana with the objective to assess the fishery in terms of their operations, their catch and bycatch, and possible ecological impacts of their operations on the marine ecosystem. Her activities in this quarter include data collection and preparing fish eggs pending counting. Preserved eggs have been wash and awaiting drying so they can be counted. Data collection is scheduled to end in the fourth quarter of Year 4, while further analyses on data obtained and thesis write-up will be done throughout Year 5.



*Figure 11: Field sampling by DFAS PhD student*

Similarly, an ongoing M.Phil research on the “Population dynamics of penaeid shrimps (Penaeidae: Decapoda) in Ghanaian waters” is contributing to the above objective. Three shrimp species were sampled for eight (8) months to determine their habitat distribution and abundance; length-frequency distribution and biometric relationships; mortality parameters and exploitation rates; and finally assess fishing techniques used in the fishery. Sampling was concluded in this quarter and the fourth quarter will be used to complete data analyses and thesis write-up. Funding for this activity will cease at the end of Year 4.



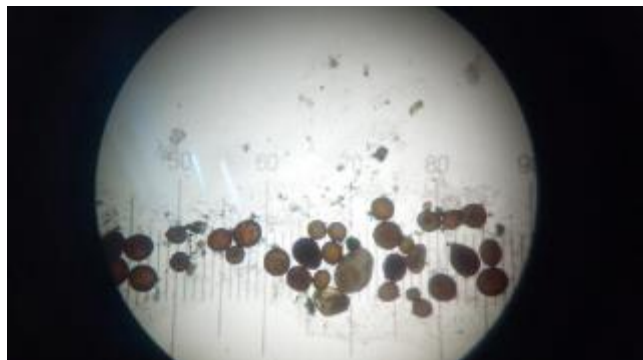
*Figure 10: Specimen sorted and identified into species level from samples (left) Carapace length measurement of *Penaeus monodon* (right)*

Other important marine fishes of commercial value were studied during this period. For instance, the fishery, biology and nutrient value of Atlantic chub mackerel has been comprehensive studied by a P.hD student currently in her third year. As she is approaching the end of her research, she has determined oocyte diameter and fecundity of Atlantic chub mackerel from preserved samples as well as conducted marginal increment analysis of otolith samples. These analyses were necessary to estimate the age and number of eggs of specimens sampled.



*Figure 12: SHaking oocytes (left) and aging analysis using otolith (right)*

The study is expected to be concluded by first month of fourth quarter however, delays in laboratory work has projected the thesis completion time to the first quarter of Year 5. Population dynamics and reproductive studies of three seabreams from Ghanaian waters have been ongoing for the past three years. For the period under review, the student determined the ova



*Figure 13: Measuring ova diameter*



diameter and counted the matured eggs in the female gonads of the three species. It is the hope of the project the thesis report of this study will be ready by the end of fourth quarter with adequate information to assess the status of the seabreams fisheries from Ghanaian waters by with reference to catch trends in their landings. This would serve as an indicator for the sustainable management of the fisheries.

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

This activity has, in previous years, been led by external facilitators and management 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. Tentatively, the Project has engaged postgraduate students to execute this activity. In this quarter, studies on “Traditional Fisheries Governance Systems and its Socio-ecological Implications on Artisanal Fisheries Management in Western Region of Ghana” continued to assess 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. Specifically, existing forms of traditional governance systems at six study sites have been documented through focus group discussions and interviews. Also, sources of conflict within the existing governance framework were identified, and structural and functional governance system developed following an established historical hierarchy of the coastal fisheries governance systems. This study is scheduled to close out in the fourth quarter. Thus, analysis of data and write-up is underway in order to meet this deadline.



*Figure 14: Focus Group Discussion with the coastal District members and Officials*

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

There is ongoing study on “molecular diagnosis of disease causing pathogens of cultured fish in Southern Ghana” is led by a second year P.hD student. The focus is to develop molecular markers for rapid diagnoses of fish diseases and to enhance effective management of diseases in culture systems. Besides collecting shrimp samples for PCR analyses and comparing pathogen load for

both wet and dry seasons, she has, in this quarter, interviewed managers of six (6) aquaculture farms on the extent of threat caused by diseases to the commercial fisheries (aquaculture industry).



Figure 15: Measuring water quality parameters in the Benya lagoon at Elmina.

A P.hD student is researching the nutrition of the Black-chinned Tilapia *Sarotherodon melanotheron* to determine indices of nutrition that will enhance the growth of the fish during culture to make it a preferred candidate for aquaculture. In this quarter, he

conducted a 24-hr sampling of fish species from the Benya lagoon and Kakum Estuary in addition to constructing shed and platform for culture experiments. The platform is mounted with aquaria, aerators and fittings pending culture experiments to start first week in July, 2018.

In terms of freshwater fish, a second year MPhil student is studying the comparative biology of *Heterobranchus longifilis* and *Clarias gariepinus* in the Offin River; towards the culture of the former. The study focuses on the food and feeding habits, sex ratio, and fecundity of these two species. With 9 months of sampling done, final sampling will be done in August of the fourth quarter to provide scientific data on the biology of *Heterobranchus longifilis* for culture purpose.



Figure 16: Catfish samples in a tray in the laboratory

Further studies, supported by the project, aims to make this observation more resolute. Two students are leading efforts in this activity. A P.hD student is studying the fishery, aspects of the Biology and culture of oyster (*Crassostrea Tulipa*) at the Densu Estuary, Tsokomey, Greater Accra Region. The study seeks to furnish stakeholders with necessary information on the current state of the fishery, aspects of the biology and the right culture methods for the sustainable management of oysters at Densu Estuary. In this quarter, socioeconomic studies were conducted to assess the current state of the oyster fishery. Also, population density of oysters was determined, fouling organisms were identified and their effects on the performance of the oysters were assessed. Finally, a comparative study on the performance of oysters grown by bottom and suspension cultures was conducted. As an on-going research, there remains four months sampling duration as the study is will be supported by the Project through Year 5. The period after sampling will be used for laboratory work and thesis writing.



*Figure 17: An interview session with the oyster fishers at Tsokomey on the Socio-economics of the oyster fishery at Densu Estuary (left) An in situ field assessment of Fouling and Growth Culture Experiments during a low tide at Densu Estuary (right)*

Complementarily, an MPhil student is assessing “water quality of some selected coastal water bodies toward the development of oyster culture in Ghana”. Parameters of interest include microbial load and heavy metal concentration of the water and the oyster meat, physico-chemical parameters and sediment grain size. Data collection period for this study ends in the first month of fourth quarter (i.e. July) while condition indices, and particle size analyses will be conducted concurrently.



*Figure 18: Inoculation of samples for microbial load determination (left). Washing sediments for particle size analysis (right)*

#### **5.4 Activity 2.1.4: Analysis of Value Chains of Fish Trade**

This activity was commissioned to complement activities 2.1.1 and 2.1.3 given the close association among these activities. The research to investigate the value chain of a commercial fish of high value is led primarily by a P.hD student with support by academic staff of the Department. The fish species of interest is the cassava croaker (*Pseudolithus* species) and the aim is to investigate the costs of the various forms of processing the croakers, examine the roles played by the various institutions in the cassava fish trade in the Central and Western Regions of Ghana, and identify the contributions of the financial institutions in the fisheries value chain. As a work in progress,



data collection on the forms of processing (identified as smoked, fried, salted, salted and dried and filleted), and cost of operation (from the supply chain stages through the value addition stage to consumption stage) continued in this quarter. Also, work identification of the roles of the institutions and financial outlets working with the actors along the value chain was completed in this quarter. In its second year, this study is will receive support through Year 5.



*Figure 19: Interviewing fish processors at Sekondi*

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

Following the halt on the engagement of external facilitators due financial challenges (see previous reports), this activity has been largely supported by M.Phil and Ph.D students who are conducting research on several coastal ecosystems. For the quarter under review, seven (7) students, comprising one (1) M.Phil student and six (6) P.hD students led efforts to achieve the objectives of this activity. The focal areas in this activity include lagoons, estuaries, rivers, beaches and mangrove ecosystems in the Central and Western regions of Ghana. With focus on the beaches, an MPhil student is conducting a study the characterization and quantification of marine litter at beaches within central region, towards the management and proper disposal of waste in Ghana. The student has, during this quarter, investigated the opinion of beach users on the sources and perception of beach litter as well as best management and mitigation practices. He has collected, sorted and counted litter from Bakano, Moree and Anomabo beaches in the Central region, pending further analyses. The study has the goal of facilitating efforts for integrated planning to reduce the accumulation and impacts of beach litter and litter generating activities and help in sustainable management of the marine and coastal environment of Cape Coast.



*Figure 20: Left: Student interviewing fisherman. Right: Weighing of beach litter*

Still in this quarter work continued in the Cape-three points area of the Western Region of Ghana to identify critical areas towards its potential designation as a Marine Protected Area. A P.hD student leads this study with the aim to assess the ecological and socio-economic values of ecosystems within the focal area. She has completed about 50 % of the ecological assessment of lagoon, river, sandy beach, rocky shore and mangroves in the study area. The ecological assessment was complemented by land use-and land cover change assessment using an UAV. The economic values of the ecosystems as well as threats to these ecosystems were identified primarily through interviews and focus group discussions. The student expects to conduct a socio-economic profile of the study area in the following quarter.



*Figure 21: Estimating the coverage and density of Sargassum (brown macroalgae) on the Cape Three Points beach to assess climatic threats to ecosystems (left). Interviewing the Head of local tourism at Princess Town to investigate the economic value of ecosystems*

In a similar study, another PhD student is researching on the “Assessment of the ecological conditions of the Ankobra estuary and their implications for coastal livelihoods” with the aim to quantify the anthropogenic impacts on the health of the Ankobra estuary. Data collection has gone

well beyond ten (10) months and is expected to continue in subsequent quarters alongside data analyses. Comparatively, an assessment of the ecological health of mangrove forests in the Kakum and Pra Estuaries in the Central and Western regions respectively is underway. This study has the focus to produce a comprehensive data needed for the sustainable management of these mangrove ecosystems.

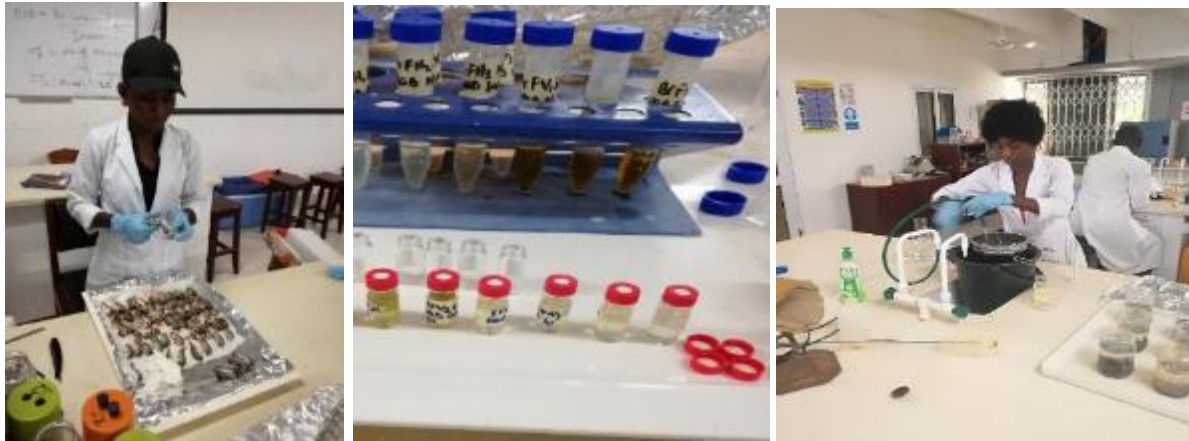


*Figure 22: Measurement of estuarine water (left). Analysis of organic Carbon Spectrophotometer (right)*

This quarter saw to the completion of data collection on litter production and sampling of macroinvertebrates awaiting analyses. In addition, mangrove cover along the two estuaries was mapped with UAV to assess spatial changes in land use. This study is expected to continue through year 5.

Focusing the health of coastal water bodies a study was commissioned in the second year to investigate the distribution and eco-toxicological effects of polycyclic aromatic hydrocarbons (PAHs) in lagoons in Ghana. The study sought to assess the levels of PAHs in the Fosu, Benya and Brenu lagoons using the fish biota and to determine the efficacy of activated charcoal in sediment remediation under laboratory conditions. Within this quarter, *in situ* measurements for temperature, pH, salinity, turbidity, conductivity, dissolved oxygen and total dissolved solutes have been recorded. A greater part of the quarter was used in data collection, thus water, sediment and fish samples are yet to be analysed with the gas chromatography estimate the concentration of PAH. Although some preliminary results have been obtained, data collection and analyses will continue in subsequent months through the fifth year of the Project.





*Figure 23: Photographs highlighting research activities*

In a related study, a second year Ph.D student is investigating the productivity of selected lagoons and estuaries through nutrient inventories and primary production assessments. These assessments are done in Ankobra estuary and Sumina lagoon in the Western and Central regions respectively. To achieve the goal of the study, the student aims to assess nutrient dynamics in the water bodies using stable isotope techniques, estimate sediment and organic matter flux into the Atlantic Ocean, and finally develop a dynamic model of processes in the coastal system to explore the consequences of environmental change. This quarter was used in data collection pending laboratory incubation of sediment-water experiments. Major analyses have been reserved for fourth quarter of year 4 on the basis of a planned schedule to analyse these samples at URI during the one semester dual degree program.



*Figure 24: Field experimental setup for nutrient flux determination at Sumina Lagoon (left). Student preparing reagent for laboratory analysis of samples (right)*

### ***Mapping and Monitoring of Coastal Ecosystems***

The Project Activity 2.1.5 is to monitor the biodiversity and health of coastal ecosystems. In view of this, the GIS team is using UAV technology to collect spatial data on some vital to coastal ecosystems including coastal waterbodies, wetlands and mangrove forests. The team is also employing UAV technology to monitor changes that are occurring along the coast such as shoreline changes and mangrove degradation. The figure below shows areas that have been covered so far.

### 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<sup>®</sup>, which can be accessed online via <http://fishcomghana.com>. No new data has been added to the platform during the quarter under review although the period was used for editorial tasks on the back-end of the platform. Below are some reports of access to the platform and acquisition of data.

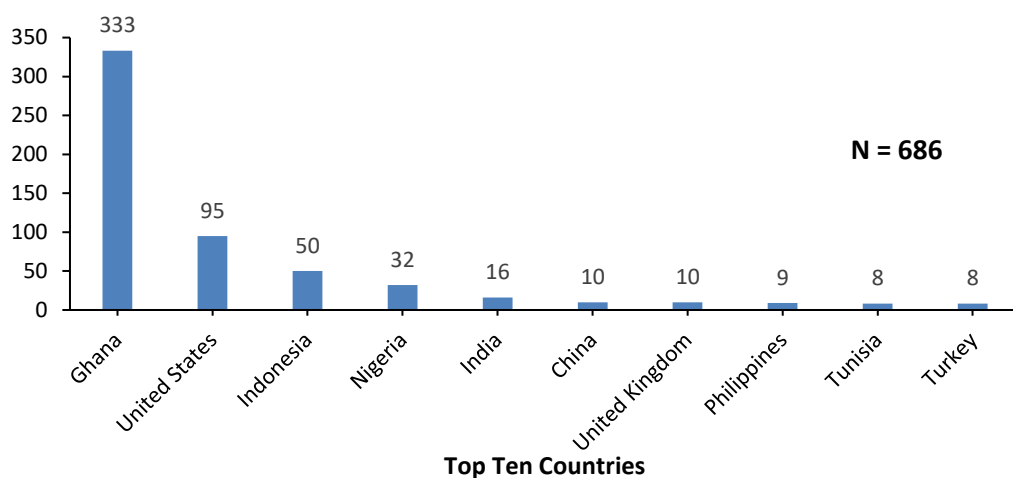


Figure 25: FishCoMGhana Data Acquisition by Country

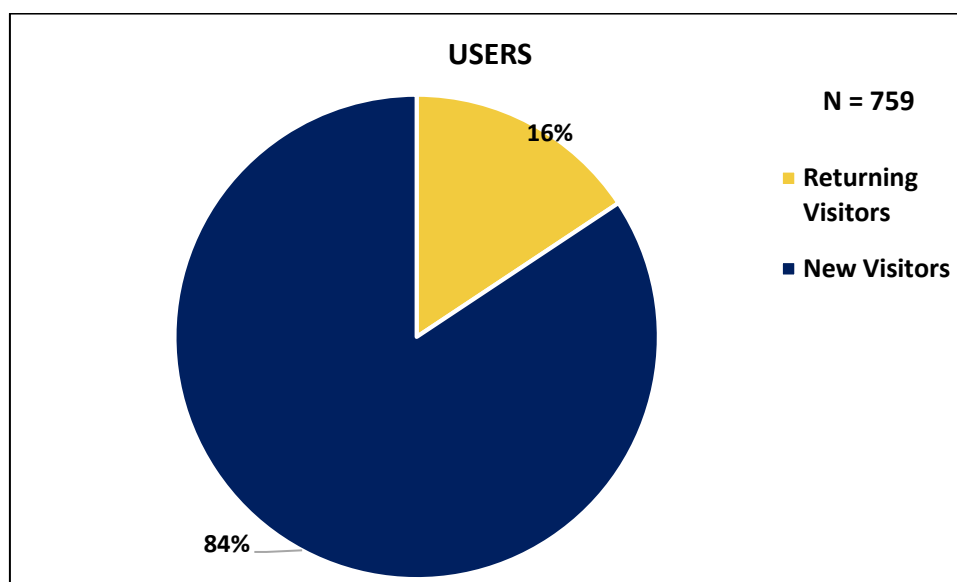
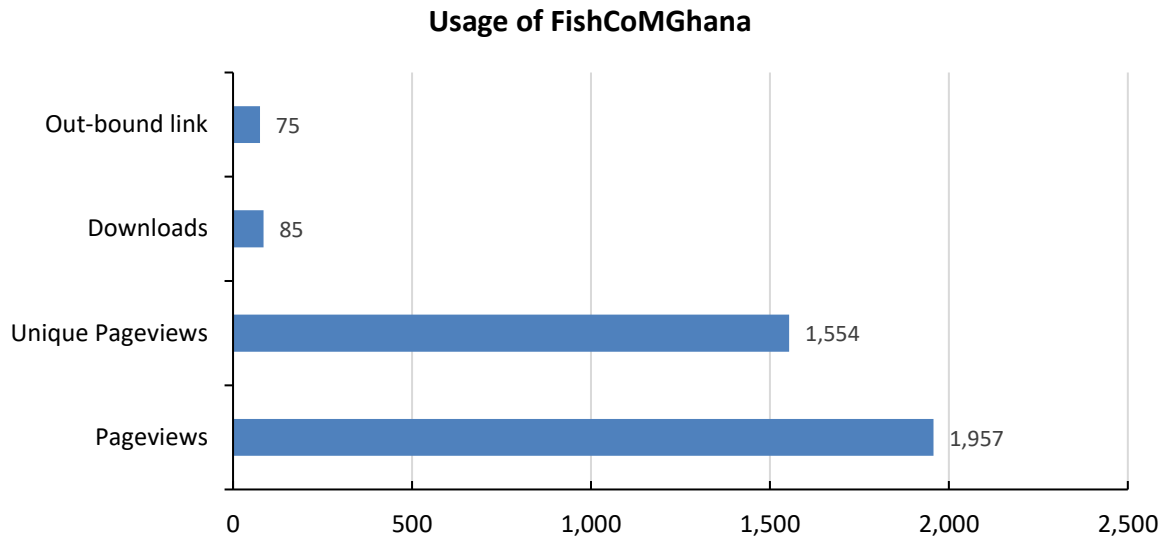


Figure 26: Summary of FishCoMGhana



*Figure 27: Usage and interaction on FishCoMGhana*

In addition, a greater part of this quarter had been spent receiving and working on manuscripts for publication in the Journal of Fisheries and Coastal Management (JFCoM). In the quarter some manuscripts have been dispatched to be peer-reviewed. Accepted manuscripts will be published on <http://jfcom.fishcomghana.com>.



*Figure 28: Web banner of the Journal of Fisheries and Coastal Management established by CCM*

A total of seventeen manuscripts were received through the online portal of the Journal of Fisheries and Coastal Management. In the quarter under review, all manuscripts received went through preliminary assessments by editorial assistants. Upon this assessment manuscripts were sent back to reviewers for initial corrections. Ten of the manuscripts were returned by the authors, and subsequently forwarded to the Editor-in-Chief for onward forwarding to reviewers, some of whom have returned their reviews. See Table 3 for a summary of progress of work with respect to author manuscripts submitted to JFCoM. To guide the process of review and to ensure a standard of operation, a reviewers guide was developed (Appendix 1) by Editorial Assistants. This guide was attached to all manuscripts that were sent for review for their reporting as well.

Ongoing activities include compilation of email addresses and contacts of universities and other relevant institutions, within and outside the African region, that are considered to potentially have individuals with interest in fisheries, aquaculture and coastal management at large. This will help



in a targeted advertisement of the Journal. In addition, processes are underway to appointment of editorial board members and all staff of the Journal. Materials and policies are being put together towards indexing the Journal as well.

*Table 3: Summary of manuscripts submitted to the JFCoM*

<b>17</b> <i>Submitted</i>	<b>10</b> <i>In review</i> <i>Reviewers assigned</i>	<b>07</b> <i>Sent to authors for</i> <i>corrections after</i> <i>preliminary assessment</i>
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## **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**

This activity has been scheduled to take place in the fourth quarter of Year 4

### **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

### **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**

As part of the preparatory process of the Norwegian funded Fish for Development (FfD) Project, a team of six (6) Ghanaians with research, marine, aquaculture and academia background were delegated by the Honorable Hon. Elizabeth Afoley Quaye, Minister for Fisheries and Aquaculture Development to visit Norway to have an overview of their fisheries sector in order to help

determine the details of the cooperation process on the fisheries and aquaculture project to be carried out between the two countries. The visit which was led by the Honorable Deputy Minister of Fisheries and Aquaculture Development (Hon. Francis Kinsley A. Codjoe) had the primary objective to strengthen the institutional linkages, understand existing structures in Norway and legal basis for fisheries and aquaculture in that country to be able to share and draw lessons with the Norwegian counterparts through the cooperative effort. It is the intended goal of the FfD Project to strengthen the roles of government participation, research and the private sector through strategic partnerships and promote coordination with other donor programs.

Linkages to relevant institutions and local government authorities in Norway established through key institutions that were visited during the trip:

- Institute of Marine Research
- Directorate of Fisheries
- The Veterinary Institute
- University of Bergen
- Norwegian Food Safety Authority
- Morten Storebo, the Mayor of Austevoll
- Private Hatcheries e.g. Marine Harvest and other industry players.

Two major outputs have emerged, resulting from that visit:



*Figure 29: Prof. Denis Aheto at the Institute of Marine Research, Bergen*

1. A collaborative proposal was jointly developed by UCC's Department of Fisheries and Aquatic Sciences (DFAS), the UG's Department of Fisheries and Marine Sciences and the Institute of Marine Research and submitted to NORPAT, a funding cooperation between Norway and developing countries (<https://www.siu.no/eng/For-the-media/News/Funding-for-cooperation-between-Norway-and-developing-countries>) for a joint project on capacity building at postgraduate masters and PhD levels in fisheries and aquaculture that also allows for exchange of students and scientists between Norway and Ghana.
2. The Centre for Coastal Management (CCM) selected to contribute to technical discussions in upcoming workshops in August 2018 within the context of the Fish for Development Project (FfD) relative to Fisheries and Oil and Gas interactions in Ghana.



*Figure 30: Institute of Marine Research, Bergen*

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

Under the last quarter, the project assisted the Coastal Sustainable Landscapes Project (CSLP) to organize a two-day training for six JHS teachers from Yabiw and Akwaidaa communities to mentor wetland school clubs. The participants comprised of five males and a female. The training involved both practical and theoretical modules in the following modules:

Module: 5 -Water quality and Invertebrate Monitoring

Module: 6 – Fisheries Monitoring

Module: 7- Wildlife Monitoring



*Figure 31: Training of JHS teachers on wetlands monitoring*

**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**

There was no activity in the quarter under review.

## APPENDICES

### Appendix 1: Reviewers guide for JFCoM

#### **Journal of Fisheries and Coastal Management**

Department of Fisheries and Aquatic Sciences  
College of Agriculture and Natural Sciences  
University of Cape Coast

### **REVIEWERS GUIDE**

#### **Questions to guide the reviewer regarding decisions on ORIGINAL RESEARCH MANUSCRIPTS**

1. Does the manuscript provide new information that is not already available in published form?  
If yes, please provide a description of what you believe is new.  
If no, then unless the manuscript has something else extremely important to offer, the manuscript likely should be rejected.
2. Do the authors provide a sound rationale for performing this study? If no, then the manuscript likely should be rejected.
3. Has the data been properly analyzed?  
If no, then the manuscript likely should be rejected or major revisions should be requested.
4. Have the results been clearly presented?  
If no, then a major revision should likely be requested.

#### **Please list major comments that need to be addressed in a revision (i.e., the manuscript cannot be accepted unless these comments are adequately addressed)**

- 1.
- 2.
- 3.

#### **Please list other comments that you request to be addressed in a revision**

- 1.
- 2.
- 3.

#### **Other items to be considered when composing your review (please structure your review using the headings listed below)**

##### **The Abstract**

- Does the Abstract appropriately summarize the manuscript?
- Do any discrepancies exist between the Abstract and the remainder of the manuscript?
- Can the abstract be understood without reading the manuscript?

##### **The Introduction**

- Is the Introduction concise?



- Is the purpose of the study clearly defined?
- Do the authors provide a rationale for performing the study based on a review of the relevant literature?
- Do the authors define terms used in the remainder of the manuscript?
- Is there is a well-defined hypothesis?

### **Methods**

- Could another investigator reproduce the study using the Methods as outlined?
- Do the authors justify any choices available to them in their study design (e.g., choices of imaging techniques, analytic tools, or statistical methods)?
- Have the authors designed methods that could reasonably allow their hypothesis to be tested

### **Results**

- Are the Results clearly explained?
- Does the order of presentation of the Results parallels the order of presentation of the Methods?
- Are the Results reasonable and expected?
- Are any Results introduced that are not preceded by an appropriate discussion in the Methods?

### **Discussion**

- Is the Discussion concise?
- Do the authors state whether the hypothesis was verified or falsified?
- Are the author's conclusions justified by the results found in the study?
- Do the authors adequately account for unexpected results?
- Do the authors note limitations of the study?

### **Figures and Graphs**

- Are the figures and graphs correct and are they appropriately labeled?
- Do the figures and graphs adequately show the important results?
- Do arrows need to be added to depict important or subtle findings?
- Do the figure legends provide a clear explanation that allows the figures and graphs to be understood without referring to the remainder of the manuscript?

### **Tables**

- Do the tables appropriately describe the Results?


### **References**


- Does the reference list follow the format for the journal?
- Does the reference list contain errors?
- Do any important references need to be added?

*I am:*

**Ernest Obeng Chuku**  
Principal Research  
Assistant in Fisheries and  
Coastal Management

- Sustainable development
- Fisheries
- Aquaculture
- Culture & Heritage
- Graphic Art
- Sports (B'ball)
- Oysters!!






**Centre for  
Coastal  
Management**

*I come from:*

**GHANA**



**West Africa**

238,533 km<sup>2</sup>

Kwame Nkrumah  
Ind'ce - 1957

Cedis & Cocoa

Formerly Gold Coast

Kofi Annan

World's Largest  
man-made lake

Over 40 lang's  
10 Regions

*One WHS in my country is:*



**Fort St. Jago, Elmina (1660s)** UNESCO World Heritage Site


- A small Portuguese chapel dedicated to Saint Jago, previously stood in its location
- 1637, the Dutch installed heavy guns on the hill from where they had barraged the weakest side of Portuguese-controlled St. George's Castle, forcing its surrender.
- 1660s, Built for military reasons; to protect St. George's Castle
- Used by the Dutch as a prison for European convicts and as a disciplinary institution for their disobedient officers
- After 1872, its English owners altered for some civilian uses

Source: <http://www.ghanamuseums.org/forts/fort-st-jago.php>

*and the main challenge(s)  
for its conservation:*

- **Currently** under no dedicated management
- Almost abandoned to ruins
- Past management attempts to use as rest place, inn, restaurant, etc. have failed
- **Way forward:** CCM proposes to partner GMMB to use as satellite community outreach centre for sustainable fisheries and coastal management & promote fisheries tourism



Appendix 3: 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><b>Comments:</b> 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><b>Comments:</b> 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 (<math>F_{msy}</math>) to be 0.74 which was higher than the preferred Fishing Mortality at MSY (<math>F_{msy}</math>) of 0.40. In FY 2017, the SFMP reported Fishing Mortality at MSY (<math>F_{msy}</math>) 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>							

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
3	Biomass to produce MSY ( $B_{msy}$ )	-	-	-	-	-	-
<p><b>Comments:</b> 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 (<math>B_{msy}</math>) to be 182,726 tonnes which was less than the preferred Biomass to produce MSY (<math>B_{msy}</math>) of 310,476 tonnes. In FY 2017, the SFMP reported Biomass to produce MSY (<math>B_{msy}</math>) 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><b>Comments:</b> 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. Discussions have been initiated 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. Implementation of the last phase of this activity will commence once there is availability of funds.</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
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
<p><b>Comments:</b> 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. Discussions have been initiated 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><b>Comments:</b> 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>							



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
7	Number of people receiving USG supported training in natural resources management and/or biodiversity conservation	0	250	100	0	0	Yes
<p><b>Comments:</b> 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>							
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><b>Comments:</b> 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>							

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
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><b>Comments:</b> 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>							
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><b>Comments:</b> 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>							

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
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><b>Comments:</b> 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><b>Comments:</b> 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

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><b>Comments:</b> 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.</p>							
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
<p><b>Comments:</b> 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.</p>							
15	Number of rural households benefiting directly from USG interventions	0	200	100	80	80	Yes
<p><b>Comments:</b> Eighty (80) rural households benefited directly from project interventions through supplementary livelihood support in snail farming and bee-keeping 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
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
<p><b>Comments:</b> 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><b>Comments:</b> 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>							

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
18	Number of new research collaborations established between USG-supported beneficiaries and other institutions	0	10	5	0	0	No
<b>Comments:</b> No new collaborations were established in this reporting period.							
19	Number of scientific studies published or conference presentations given as a result of USG assistance for research programs	0	10	5	0	0	No
<b>Comments:</b> 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	No
<b>Comments:</b> No dialogues and stakeholder consultations were held on fisheries and coastal management in this reporting quarter.							

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
21	Percentage of graduates from USG-supported tertiary education programs employed	0	50	5	1	20	No
<p><b>Comments:</b> One (1) student graduated with MPhil in Fisheries Science in this reporting period but has not been employed. Similarly, four other students supported by the project graduated with master's degrees 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.</p>							
22	Number of CSOs and government agencies strengthened	0	25	25	0	0	Yes
<p><b>Comments:</b> 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><b>Comments:</b> Two-hundred and one (201) people benefitted directly in various ways as indicated above from project interventions in this reporting period.</p>							

