



USAID | **GHANA**
FROM THE AMERICAN PEOPLE



**UNIVERSITY OF
CAPE COAST**

USAID/UCC FISHERIES AND COASTAL MANAGEMENT CAPACITY BUILDING SUPPORT PROJECT



YEAR TWO

THIRD QUARTER REPORT

1ST APRIL – 30TH JUNE, 2016

DEPARTMENT OF FISHERIES AND AQUATIC SCIENCES

UNIVERSITY OF CAPE COAST

July

2016

LIST OF ABBREVIATIONS

CCM	Centre for Coastal Management
DFAS	Department of Fisheries and Aquatic Sciences
EMMP	Environmental Monitoring and Mitigation Plan
FtF	Feed the Future
GIS	Geographic Information System
GoG	Government of Ghana
ICM	Integrated Coastal Management
M & E	Monitoring and Evaluation
MoFAD	Ministry of Fisheries and Aquaculture Development
UCC	University of Cape Coast
URI	University of Rhode Island
USAID	US Agency for International Development
USG	United States Government
PMP	Performance Monitoring Plan
PIRS	Performance Indicator Reference Sheets
SFMP	Sustainable Fisheries Management Project

This document was prepared for USAID/Ghana under Agreement (PIL No.: 641-A18-FY14-IL#007) awarded on October 24, 2014 to the Department of Fisheries and Aquatic Sciences of the University of Cape Coast entitled; the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project. This document is made possible by the support of the American People through the United States Agency for International Development (USAID). The views and opinions contained in this report are those of UCC/DFAS Project team and are not intended as statements of policy of USAID. As such, the contents of this report are the sole responsibility of the UCC/DFAS Project team and do not necessarily reflect the views of USAID or the United States Government.

Contact Information:

USAID/UCC Fisheries and Coastal Management Capacity Building Support Project
Department of Fisheries and Aquatic Sciences (DFAS), School of Biological Sciences,
College of Agriculture and Natural Sciences, University of Cape Coast.

UCC Representatives:

Prof. Domwini D. Kuupole
Vice-Chancellor
University of Cape Coast
Tel: +233 (0) 332132378/32050
Email: vc@ucc.edu.gh

Dr. Denis Worlanyo Aheto
Project Manager
USAID/UCC Fisheries and Coastal
Management Capacity Building Support
Project, Department of Fisheries and
Aquatic Sciences
Tel: +233 (0) 242910056
Email: daheto@ucc.edu.gh

USAID Administrative Contacts:

Kelvin Sharp
Director
Economic Growth Office, USAID/Ghana
American Embassy, 24 Fourth Circular
Rd.
Tel: +233 (0) 302 74 1132
Email: ksharp@usaid.gov

Justice O. Odoi
Activity Manager (AM)
Economic Growth Office, USAID/Ghana
American Embassy, 24 Fourth Circular
Rd.
Accra-Ghana
Tel: +233 (0) 30 274 1828
Email: jodoi@usaid.gov

Citation:

Department of Fisheries and Aquatic Sciences (2016). *The USAID/UCC Fisheries and Coastal Management Capacity Building Support Project*. Third Quarter Report in Year Two, April 1, 2016 – June 30, 2016. University of Cape Coast, Cape Coast, 63 pp.

Cover photo:

Vice Chancellor of University of Cape Coast (Prof. D. D. Kuupole) welcomes President of University of Rhode Island (Dr. Dooley) to the University of Cape Coast – April, 2016.

TABLE OF CONTENTS

LIST OF FIGURES	6
LIST OF TABLES	7
1.0 INTRODUCTION	8
1.1 The USAID Fisheries and Coastal Management Capacity Building Support Project	8
1.2 The Department of Fisheries and Aquatic Sciences of the University of Cape Coast	9
1.3 Monitoring and Evaluation (M&E).....	11
1.3.1 <i>Monitoring, Evaluation and Results-Based Management Training Workshop</i>	11
1.3.2 <i>USAID/Ghana Economic Growth Office Implementing Partners (IP) M&E Staff Working Group Meeting</i>	14
2.0 PROGRAM COMPONENTS, MANAGEMENT AND ACTIVITIES IN THE THIRD QUARTER OF YEAR TWO.....	15
2.1 Activities Completed in the Third Quarter.....	15
Summary of key activities completed within the Third Quarter include:	15
3.0 PROJECT OUTPUT 1.1: IMPROVED INFRASTRUCTURE.....	18
3.1 Activity 1.1.1: Renovating and Equipping Fisheries and Coastal Research Laboratory	18
3.2 Activity 1.1.2: Refurbishing and Equipping office/Lecture/Computer rooms and Library	21
3.3 Activity 1.1.3: Acquisition of Vehicles to Support Educational, Training, Research and Extension Activities	21
4.0 PROJECT OUTPUT 1.2 INCREASED TECHNICAL AND SCIENTIFIC KNOWLEDGE	22
4.1 Activity 1.2.1: Academic and Technical Staff Capacity Strengthening	22
4.2 Activity 1.2.2: Operationalization of the Centre for Coastal Management	23
4.3 Activity 1.2.3: Support for Postgraduate (MPhil & PhD) Training Program	25
4.4 Activity 1.2.4: Undergraduate Research Grants	26
5.0 PROJECT OUTPUT 2.1: INCREASED MARINE AND COASTAL RESEARCH AND RESOURCE ASSESSMENTS	29
5.1 Activity 2.1.1: Conducting Fisheries Stock Assessment	29
5.2 Activity 2.1.2: Conducting Research and Assessment on Marine Fisheries Governance Issues	30
5.3 Activity 2.1.3: Research on Fish and Shellfish of Commercial Value	32
5.4 Activity 2.1.4: Analysis of Value Chains of Fish Trade	34
5.5 Activity 2.1.5: Monitor the Biodiversity and Health of Coastal Ecosystems	34
5.6 Activity 2.1.6: Developing Marine and Coastal Fisheries Database.....	37
6.0 PROJECT OUTPUT 2.2: COMMUNICATION, EXTENSION AND OUTREACH IMPROVED	37

6.1 Activity 2.2.1: Developing Material and Conducting Training on Integrated Coastal Management.....	37
6.2 Activity 2.2.2: Developing Material and Conducting Training on Fisheries Management	38
6.3 Activity 2.2.3: Developing Manuals and Updating Training Materials on Climate Change Adaptation and Mitigation	38
6.4 Activity 2.2.4: Developing Material and Conducting Training on the use and Application of Geographical Information Systems (GIS).....	39
6.5 Activity 2.2.5: Engaging Policy Makers to Address Coastal and Fisheries Issues	40
6.6 Activity 2.2.6: Building Institutional Partnerships and Collaboration.....	42
6.7 Activity 2.2.7: Wetlands Ecological Health Monitoring Using School Clubs and Communities	47
6.8 Activity 2.2.8: Strengthening Community-based Groups.....	49
6.9 Activity 2.2.9: Promoting Supplementary Livelihoods in Coastal Communities	50
<i>Selection of communities and trainers for supplementary livelihood activities.....</i>	50
<i>Community remobilization.....</i>	50
<i>Local market survey.....</i>	50
<i>Training of actors in snail farming, bee-keeping and oyster rearing</i>	51
APPENDICES	54
Appendix 1: List of indicators and third quarter 2016 results	54
Appendix 2: Call for Applications for Scholarships 2011/17 Academic Year	60

LIST OF FIGURES

Figure 1: Map shows geographical areas where project implementation is focused	9
Figure 2: Participants at the M&E workshop in Koforidua	13
Figure 3: Participants from UCC receiving certificates at the end of training.....	13
Figure 4: The President of the University of Rhode Island led a delegation of 7 dignitaries from URI to visit the UCC to expand collaborative relationships with the UCC.....	16
Figure 5: Wetlands monitoring workshop by DFAS, FoN and Hen Mpoano.....	17
Figure 6: Cross section of community and key stakeholders at the meeting on Tuesday 24th May, 2016	17
Figure 7: Some laboratory equipment installed in the Fisheries and Coastal Research Laboratory	19
Figure 8: The DFAS research Vessel (<i>RV Sardinella</i>).....	20
Figure 9: Offices being refurbished for DFAS lecturers to enhance teaching and learning	21
Figure 10: Some staff of DFAS in a training session at the Ghana Atomic Energy Commission.....	22
Figure 11: Website banner used for publicity of the public lecture on DFAS website.....	24
Figure 12: Prof. Richard Borroughs.....	25
Figure 13: Bumper fish harvest from beach seining activity at Atwenbanso landing beach, Jomoro District: Suspected outcome of ban on light fishing in the District. July 2016.....	30

Figure 14: District Chief Executive (DCE) of Abura/Asebu/Kwamankese (AAK) District at Fisheries Governance Validation Meeting at Moree (June 2016).....	31
Figure 15: Children perform 'oyster dance' at low-tide level to harvest oysters.....	32
Figure 16: Active beach by day.....	33
Figure 17: Coastal Map of Ghana showing fish landing ports and selected sampling stations.....	34
Figure 18: Awiane lagoon at Half Assini in the Western Region, Ghana.....	35
Figure 19: Current state of some parts of the Awiane Lagoon.....	36
Figure 20: Participants at the stakeholder meeting at the Jomoro District Assembly, Western Region, Ghana.....	36
Figure 21: Research assistants filling questionnaires during the GIS needs assessment.....	39
Figure 22: Participants of the National Scientific Meeting on Fisheries and the Coastal Environment.....	41
Figure 23: Prof. D. D. Kuupole welcomes URI team at the UCC.....	42
Figure 24: Signing of MoU between UCC and URI.....	43
Figure 25: Final year DFAS students at the SFMP office in Accra.....	44
Figure 26: Participants at the Fisheries Leadership Course.....	45
Figure 27: Use of UAV for mapping Awiane Lagoon in the Jomoro District, Western Region, Ghana.....	46
Figure 28: Dialogue session at the forum.....	46
Figure 29: At the write-shop to develop a proposal to “Train African professionals in fisheries and aquaculture”.....	47
Figure 30: Wetlands monitoring workshop for Junior High School teachers.....	48
Figure 31: Trainers from DFAS teach oyster group how to prepare cultches for spat collection in lagoon.....	52
Figure 32: Cultches arranged on a rack ready for planting in the Narkwa lagoon.....	53
Figure 33: Two members of the oyster group carry cultches into Narkwa lagoon.....	53

LIST OF TABLES

Table 1: Details of the five courses offered at RMU.....	23
Table 2: List of PhD students admitted with full scholarship from USAID.....	25
Table 3: List of MPhil students admitted with full scholarship from USAID.....	26
Table 4: Undergraduate Research Projects.....	26

1.0 INTRODUCTION

1.1 The USAID Fisheries and Coastal Management Capacity Building Support Project

The Fisheries and Coastal Management Capacity Building Support Project awarded to the University of Cape Coast's Department of Fisheries and Aquatic Sciences, on 24th October, 2014 by the United States Agency for International Development (USAID) is intended to implement a nation-wide academic mobility program to produce highly skilled Ghanaian professionals through training in various academic disciplines namely Fisheries Science, Oceanography, Limnology, Aquaculture and Integrated Coastal Zone Management. It is an overall goal that graduates (i.e. BSc, MPhil and PhD) from these programs will be well equipped with the right knowledge and attitudes to support the fisheries sector in promoting fish production using scientific knowledge as the bedrock, contribute to increased income and enhance the employment prospects of the graduates in the job market. The project is also augmenting the capacity of staff to better prepare students not only for the labour market but also keenly focused on strengthening the institutional capacity of the Department of Fisheries and Aquatic Sciences (DFAS) and the Centre for Coastal Management (CCM) to engage in state-of-the-art research and training of students, professionals, as well as administrative and technical staff.

It is expected that these actions, will lead to an enhanced knowledge, and improved skills in fisheries, aquaculture and coastal resources management, improved social skills and internationalization of DFAS academic programs through student and staff exchanges with the University of Rhode Island and the possible creation of dual degree programs between UCC and URI at the PhD level. The project is ensuring an intensified training in relevant areas with focus on high quality delivery of technical knowledge not only to university students but also to professionals working within government agencies alike. Indeed, the project adds value to the work of the Department of Fisheries and Aquatic Sciences (DFAS) and the Centre for Coastal Management of the University in terms of administrative, technical and financial assistance. USAID's total contribution to this Project is up to the tune of US\$5,500,000, which will be sub-obligated on yearly increments to enable DFAS effectively coordinate capacity building at various levels for sustainable marine fisheries management in Ghana over a period of five years (2014-2019). The USAID award represents a strategic investment from the American people for food security in Ghana programmed under the US Government's Feed the Future Initiative¹ and subject to the terms and conditions of the Agreement signed with the University of Cape Coast (PIL No.: 641-A18-FY14-IL#007).

Therefore the project activities contribute to USAID's development strategy for Ghana as outlined in its Country Development Cooperation Strategy (CDCS), directly in support of the Development Objective Two: Sustainable and Broadly Shared Economic Growth². It is expected that by the end of the project, capacity building for sustainable marine fisheries management in Ghana can be quantitatively proven and demonstrable management outcomes for the country's coastal-marine space and resources will be evident.

¹ Is a US Government-led initiative for food security in developing countries

² To obtain the full report, please visit

http://www.usaid.gov/sites/default/files/documents/1860/Ghana_CDCS_fy2013-17.pdf

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

This project has also enabled targeted collaborations with relevant partners including the Ministry of Fisheries and Aquaculture Development (MoFAD) and the Fisheries Commission of Ghana, libraries and research institutions with the idea to promote increased use of science and applied research for decision making, law enforcement, climate change adaptation and biodiversity conservation for poverty alleviation.

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

These improvements coupled with award of student scholarships will facilitate the training of 10 PhD, 20 masters and 150 undergraduate students. The package also includes financing of short courses on climate change adaptation, fisheries and coastal management for other relevant professionals over the course of five years. The short courses will be run under the ambit of the Centre for Coastal Management (CCM)³ as part of its operationalization. The project will also support the implementation of its strategic plan, develop business plans for the Centre, enhance roundtable policy dialogues, and undertake critical research with the help of its newly refurbished Fisheries and Coastal Research Laboratory within DFAS.

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

The University of Cape Coast (UCC) is located close to the ocean making the Department of Fisheries and Aquatic Sciences (DFAS) one of the leading institutions in the area of Fisheries and Marine Sciences in Ghana. Indeed, the Department since its inception in 2002 has the vision to become unique and an innovative partner in advancing healthy aquatic ecosystems for the sustained provision of goods and services, in collaboration with public and private institutions, both local and international.



Figure 1: Map shows geographical areas where project implementation is focused

³ CCM was established in December 2013 by the Academic Board of the University of Cape Coast.

This vision is beginning to see the light of the day through the USAID multi-year funding to the tune of US\$ 5.5 million. Through this grant, the capacity of the Department to deliver this vision is enhanced through the provision of adequate logistics and teaching infrastructure, increasing student numbers, largely due to new knowledge about the capacity of the Department, possible job opportunities, enhanced sensitization about the Department and deepening relationships with related institutions. With this project coming on board, a lot of issues have been largely addressed. The USAID funds has enabled the Centre for Coastal Management to effectively take off its operations and received formal institutional recognition.

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

- 1) Oceanography, Limnology and Aquatic Ecology
- 2) Integrated Coastal Resource Management including Petroleum Ecology and Climate Change Studies
- 3) Aquaculture, bridging gaps between demand and supply in the fishing industry and aquaculture entrepreneurship
- 4) Fisheries Science including fisheries ecology and organismic interactions.

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

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

Staff and students also benefit from interactive teaching and learning alongside with field visits and real-time laboratory exposure for practical experience. It is anticipated that the graduates could engage in research work in Institutions (including Council for Scientific and Industrial Research-Water Research Institute (CSIR-WRI), Ministries (Fisheries and Aquaculture Development; Environment, Science and Technology; Agriculture), Environmental sector, Financial institutions, Oil and Gas industry, NGOs (local and international), Managers of Aquaculture Facilities, Navy, Academia, or become Entrepreneurs among others. The Department strives to communicate with its students and stakeholders through staff blogs, Departmental websites and social interactive platforms such as Facebook. For further information, please see:

<https://dfas.ucc.edu.gh/>

<https://www.facebook.com/dfas.ucc.edu.gh>

1.3 Monitoring and Evaluation (M&E)

1.3.1 Monitoring, Evaluation and Results-Based Management Training Workshop

As part of AfricaLead's efforts at providing capacity building support services to strengthen institutions to implement their projects and program activities, AfricaLead organized a 5-day M&E and Results-Based Management (RBM) training workshop at the Capital View Hotel in Koforidua from 25th to 29th of April, 2016. The key objective of the training was to equip participants with the effective use of modern RBM & M&E tools. The workshop covered the building blocks and key elements of RBM as well as reporting. It did not only teach participants how to effectively use modern RBM & M&E tools but also how to communicate information on project performance to their organization and stakeholders. The following topics were covered in the short course:

- M&E/RBM concepts and terminologies
- Knowledge Management framework within and Performance Management Lifecycle
- Developing performance indicators
- Log frame/Results Framework Concepts
- Operationalizing the Knowledge Management framework
- Developing data collection tools and determine methodologies for data collection
- Data analysis techniques
- How to develop a Performance Management Plan (PMP)
- Reporting: report writing, organization of data, and formatting
- Developing a roadmap to operationalize the M&E system

The workshop was organized for 3 main USAID IPs; USAID/UCC Fisheries and Coastal Management Capacity Building Support Project, the University of Ghana Agriculture Technology Capacity Building Support Project and the Ghana Commercial Agriculture Project (GCAP) to improve on their planning, analysis, and decision-making capacity, increase the availability, applicability and use of high-quality evidence-based data for decision-making. This training workshop was targeted at people directly involved in M&E and Project Management as well as Administrative staff. It was attended by 6 people from UCC, 4 from DFAS and 2 from the Department of Molecular Biology and Biotechnology (DMBB) of the School of Biological Sciences (SBS). In attendance from UCC were:

- Dr. Noble K. Asare (Lead) - DFAS
- Mr. Godfred A. Asiedu - DFAS
- Dr. Aaron Tetteh Asare - MBB
- Dr. Foster Kyei - MBB
- Mrs. Lesley Ntim - DFAS
- Mr. Ernest Obeng Chuku - DFAS

From the training the UCC team learnt the various components of M&E system and in detail, the elements of M&E plan. One of the key highlights of the training was M&E results. It was learnt that objectives must be translated into results which are presented in the logical framework and the results framework. The team also got a clearer understanding of different

levels of results (output, outcome, impact) and how to select “SMART” indicators for the different levels of results. An important ingredient in M&E for RBM is team work, which was demonstrated in several simple team-building exercises which brought out the essence of team work engaging and allowing participants to solve problems together in teams. In general, the training on M&E and RBM was very beneficial since it used very innovative techniques to help participants get basic understanding of the subject matter. By the end of the training, participants had completed action plans and results frameworks to build M&E systems for their respective institutions and/or project. The UCC team developed an action plan to improve the M&E system for the ongoing USAID/UCC Fisheries and Coastal Management Capacity Building Support Project and to set up an M&E system for the Department of Fisheries and Aquatic Sciences. A comprehensive structure was further designed, to support the establishment of an M&E system for DFAS, which could be a model for the School of Biological Sciences and other departments of the School. This included an introduction to the M&E plan, and introduction to the action plan, and a results framework. Certificates were issued to all participants and all training materials were made available on pendrives to participants as well.

The following conclusions and lessons were drawn from participating in the workshop:

1. The USAID/UCC project M&E system should be improved based on the skills and knowledge acquired from the workshop to enhance accurate reporting on project performance.
2. M&E systems should be developed for DFAS and other Departments of the School of Biological Sciences, building on the knowledge acquired by workshop participants from the UCC.
3. The Dean of the SBS should appoint an M&E coordinator and team who will be responsible for overseeing the M&E system for the School and all departments within the School.
4. It is recommended that the UCC establishes an operational M&E system for the entire University.



Figure 2: Participants at the M&E workshop in Koforidua



Figure 3: Participants from UCC receiving certificates at the end of training

1.3.2 USAID/Ghana Economic Growth Office Implementing Partners (IP) M&E Staff Working Group Meeting

The USAID/Ghana Economic Growth Office Implementing Partners M&E staff working group meeting is an annual event organized by METSS which brings together all USAID/Ghana IPs M&E staff to review their M&E systems, activities, reporting requirements and responsibilities of all IPs and share experiences across projects that lead to improvements in project performance. FY2016's meeting was held in Kumasi in the Ashanti Region of Ghana at the Golden Bean International Hotel from 27th -30th June. There were representations from all projects including the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project. The meeting was attended by Dr Noble Asare (Project M&E Coordinator) and Mr Godfred Ameyaw Asiedu (Project M&E Support) from the UCC. The purpose of the meeting was to review M&E activities for all projects, to facilitate learning across projects and to clarify all issues relating to M&E with METSS so that all Implementing Partners will have a common understanding and agreements on M&E reporting requirements of USAID/Ghana. The workshop was intended to contribute to improvements in all project activities relating to monitoring, evaluation, learning and communication.

The meeting started with an introduction and a welcome statement by Mr Saaka Adams, Director of Operations METSS, with an emphasis on the aim and objectives of the meeting followed by a review and discussions of the findings from the FY2015 meeting which was held in Accra. An overview and analysis of the FTF in Ghana (2012 – 2015) was also presented. The crux of the meeting was on the following: review of indicator targets and achievements; updates from IPs and identification of project performance shortfalls; collaborating, learning and adapting for impacts; approaches in conducting beneficiary-based surveys; integrating Environmental Monitoring and Compliance into M&E functions; mainstreaming Gender in FTF Project implementation and M&E; introducing the METSS Knowledge Management Portal; introduction to AIDTracker+ and AIDTracker training and Experience Sharing across projects.

The meeting provided an opportunity for the M&E team to learn more on USAID policies, M&E reporting requirements and responsibilities of M&E staff with more emphasis on tracking progress of project activities, FTF indicators, definitions and data collection methods. It was also an opportunity for the M&E team to introduce the USAID/UCC project and its M&E system to other IPs to foster knowledge sharing and learning. The M&E team received training on the operations of the new online USAID reporting system (AIDTracker+) which will be commissioned soon for IPs to enter project M&E data and information. Knowledge acquired from this group meeting will be applied to strengthen the USAID/UCC M&E system and reporting to USAID.

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

2.1 Activities Completed in the Third Quarter

Summary of key activities completed within the Third Quarter include:

- The President of the University of Rhode Island led a delegation of 7 dignitaries from URI to visit the UCC to expand collaborative relationships with the UCC. During the visit, the President signed a MoU between URI's Coastal Resources Center (CRC) and the UCC DFAS and the Centre for Coastal Management (CCM). The President also delivered a Public Lecture at UCC entitled "Internationalization and Globalization: Education, Research, Diplomacy and Intelligence". During the visit, the Associate Director of URI Cooperative Extension, gave a seminar on the Role of Extension at the College of Agriculture and Natural Sciences, UCC.
- As part of project activities on research and policy dialogue on fisheries and coastal management issues, the project organized a national scientific meeting on fisheries and coastal environment on the theme: "Sustainable Fisheries and the Coastal Environment through Research". The meeting brought together fisheries and coastal environment research scientists at the Hans Cottage Hotel in Cape Coast to discuss research issues to inform policy decision-making.
- USAID/UCC project staff and other members of Academic Staff attended a 5-day training workshop on Monitoring, Evaluation and Results-Based Management organized by AfricaLead at the Capital View Hotel in Koforidua, Eastern Region of Ghana.
- USAID/UCC project M&E staff attended a USAID EG Office IPs M&E group meeting organized by METSS at the Golden Bean Hotel in Kumasi, Ashanti Region of Ghana.
- As part of ongoing project activities, the Coastal Management Specialist from URI visited Ghana to meet with the District Chief Executive (DCE) of Jomoro District Assembly in the Western Region and his team, the Traditional Chief of Half Assini in the Western Region and fishing community representatives to work together on efforts at ecological restoration of the Half Assini Lagoon.
- Post-graduate degree program (PhD and MPhil) applicants were shortlisted and successful candidates were invited to attend selection interviews which took place towards the end of the reporting quarter in June.
- The last of 3 containers with field and laboratory equipment was successfully cleared from the Tema Harbour, safely transported to Cape Coast and delivered to UCC authorities.
- DFAS organized a 2-day training workshop at UCC to sensitize and train 20 teachers from the Central and Western Regions. The objective of the workshop was to introduce the teachers to the training modules and ecological benchmarks for monitoring coastal wetlands, identify key issues and facilitate the development of monitoring and management programs for the selected wetlands.



Figure 4: The President of the University of Rhode Island led a delegation of 7 dignitaries from URI to visit the UCC to expand collaborative relationships with the UCC



Figure 5: Wetlands monitoring workshop by DFAS, FoN and Hen Mpoano



Figure 6: Cross section of community and key stakeholders at the meeting on Tuesday 24th May, 2016

3.0 PROJECT OUTPUT 1.1: IMPROVED INFRASTRUCTURE

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

In program efforts at operationalizing the use of the fisheries and coastal research laboratory, an important requirement concerns the certification of the laboratory. The Government of Ghana Agency responsible for the certification is the Ghana Standards Authority (GSA). The project, recognizing the need, contacted the GSA and embarked on a trip to its Head Office in Accra to make enquiries regarding the types of certification that may be required for the laboratory, other requirements as well as procedures involved in obtaining such certification and permits to operate the laboratory. In the course of enquiries, a consultative meeting was held with the Head of Management Systems Certification Department of GSA. Information gathered during the meeting suggests the following:

1. The laboratory will require an ISO 17025 accreditation and not certification.
2. ISO certifications and accreditations are provided by third parties.
3. GSA does not provide any form of ISO certification or accreditation for the operations of research laboratories in the country.
4. At present, all third parties providing ISO accreditation are internationally-based with no local parties in Ghana.
5. GSA however provides consultation services to laboratories interested in ISO accreditation.

From the meeting, it was also established that through consultations with GSA, the process of accreditation takes a minimum of 3 months but could go up to 6 months depending on the extent of work needed to be done and financial commitment of the client. GSA's consultation fee for this ISO accreditation is estimated at GHS 30,000 but could be less depending on the nature of actual work involved and the findings after an initial assessment. There is also the cost of certification from the third party who will provide the ISO accreditation. However the estimate for the accreditation can only be sorted from third parties online. To obtain the ISO 17025 accreditation therefore, Project Management must officially make a request to GSA through the Executive Director for their consultation services. The terms of reference must be clearly outlined in the official request letter. When GSA is contracted to provide the consultation service, the following procedure will be pursued with the assistance of GSA to ensure the criteria for obtaining the ISO 17025 accreditation are met;

- Installation of all required standards
- Developmental process
- Training
- Documentation
- Writing of operational procedures
- Implementation of ISO standards
- Assist in the selection of a third party for ISO accreditation



Figure 7: Some laboratory equipment installed in the Fisheries and Coastal Research Laboratory

Project Management therefore plans to do the following:

1. Develop Terms of Reference for the consultation with the GSA
2. Prepare a budget for the accreditation process
3. Check online for costs of the ISO 17025 accreditation from at least three third parties for budgeting purposes and
4. Draft a work contract for GSA consultation for its implementation to coincide with the installation of all incoming equipment for the lab to benefit from the input of GSA.

Actions have been initiated to contract the Ghana Standard Authority to begin the process for the certification of the laboratory. Procedures for the procurement of the second batch of laboratory and field equipment have also been initiated. Dr. Noble Asare has been nominated to follow up on the installation of equipment and the certification of the laboratory.

Another issue concerns the registration of the newly acquired research vessel for the project. The project has taken delivery of a research vessel which needs to be formally licensed by the appropriate Government of Ghana agency before its use. Again there was the need to make enquiries to find out the responsible agency and the procedures involved in the registration process. Enquiries were made with the Ghana Maritime Authority (GMA) and the Fisheries Commission in Accra regarding the requirement and procedures involved in the registration of research vessel and use for academic purposes. The following information was obtained from initial discussions with the Ghana Maritime Authority:

1. The Ghana Maritime Authority (GMA) will only issue registration for the vessel only after the application has been submitted through the Ministry of Transport (MoT).
2. The MoT's response to the application should then be forwarded to the GMA.
3. The Fisheries Commission is expected to play a role in the process but this could not be clarified by the GMA.

4. The GMA also cautioned that the registration process should have been initiated before the vessel was brought into the country. Now that the vessel is already here in the country, a penalty fee is likely to be charged before the vessel is registered.

It was also gathered from the enquiries with the Fisheries Commission that:

1. The application for vessel registration for the purpose of fisheries research should be submitted to the Ministry of Fisheries and Aquaculture Development (MoFAD) with a copy to the Director of the Fisheries Commission
2. The intended purpose of the vessel must be clearly stated in the application
3. All documentations on the vessel including vessel specifications, ownership as well as all other relevant documents should be included in the application
4. One other requirement is that the vessel must have a name

The GMA indicated that registration costs for the research vessel was likely to be between 500 and 2000 US Dollars but the Fisheries Commission hinted that a research vessel for education purposes will attract no registration fees and that the whole registration process would take a minimum of 2 weeks to complete. It was also made clear that the vessel cannot be used until registration process has been completed. So far the vessel has been named *RV Sardinella* and actions have already been initiated for its registration. DFAS has also suggested the names of technical staff members who should be trained to operate the vessel.



Figure 8: The DFAS research Vessel (*RV Sardinella*)

However in a letter dated 26th July, 2016 (Ref. PE 122/166/01), signed by the Hon. Minister of Fisheries and Aquaculture Development, Hanny-Sherry Ayittey, the procedure for the registration of the vessel was clearly outlined as follows:

1. The University should first register the research vessel under the Ghana Flag with the Ghana Maritime Authority in accordance with the Ghana Shipping Act, 2003 (Act 645).
2. Thereafter, the University should apply for the issuance of Fisheries Registration License from the Ministry/Fisheries Commission upon submission of the following:
 - a) Certificate of Ghanaian Registry
 - b) Condition Survey Report
 - c) Valid Safety Certificate
 - d) Valid Radio Certificate
 - e) Valid Hull and Machinery Insurance
 - f) Valid Crew Insurance
3. The University is therefore advised to send the application together with the relevant documents on the vessel to Ghana Maritime Authority for necessary action.

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

Three (3) offices of Academic staff were earmarked for refurbishment during this quarter. Refurbishment work on those offices is almost complete except that progress of work has been slow contrary to expectation mainly due to the demise of the contractor but after that, issues have been resolved between the contracting firm and the University Estates Development office and so the work should be completed very soon before the end of project Year Two. Equipment meant for the offices undergoing refurbishment have already been procured by the project awaiting completion of the refurbishment work. The library has already been refurbished and provided with equipment but other items such as books are yet to be provided even though procurement procedures have long been initiated.



Figure 9: Offices being refurbished for DFAS lecturers to enhance teaching and learning

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

Two (2) of the 3 vehicles budgeted for to be acquired by the project (the 4X4 cross-country and the Ford pick-up) were procured in FY2015 and the latter part of FY2016 respectively but the third vehicle (Toyota Coaster Bus) is yet to be received by the project. The project has gone through back-and-forth with USAID and the University procurement office and there are all indications now that the bus should be arriving before the end of FY2016 which is only about two month from now, as all the necessary documentations have been prepared, submitted and approved by all parties involved.

4.0 PROJECT OUTPUT 1.2 INCREASED TECHNICAL AND SCIENTIFIC KNOWLEDGE

4.1 Activity 1.2.1: Academic and Technical Staff Capacity Strengthening

According to the project Year Two Workplan, six DFAS members (4 Academic staff and 2 Technicians) have been scheduled to undergo training and undertake a study tour to the United States to learn about oyster culture and the mode of operations of an Atomic Absorption Spectrophotometer (AAS). Florida Gulf Coast University was selected as a destination of choice in the US for those two programs but following logistical constraints and other challenges, it was finally agreed to attend the training at the University of Rhode Island (URI) upon advise received from the Senior Fisheries Advisor of the Sustainable Fisheries Management Project who volunteered to plan a program for the participants at URI because he is very much familiar with some places and people where such studies could successfully be undertaken. For efficiency and logistical reasons, the participants have been grouped into two (Group 1: Prof. John Blay, Mr. Thomas Robin Davis and Mr. Prosper Dordunu; Group 2: Prof. Edward Obodai, Dr. Joseph Aggrey-Fynn and Mr. Joseph Debrah) and will travel at different times in September this year.



Figure 10: Some staff of DFAS in a training session at the Ghana Atomic Energy Commission

The first group is scheduled to travel to the US in the first week of September while the second group leaves in the third week. The participants have already gone through USAID/Ghana checks and their traveling documents have been processed for approval to enable them apply for their visas.

DFAS plans to train academic and technical staff on the use and operation of the newly acquired research vessel *RV Sardinella*; how to properly and safely operate and maintain the vessel. The Regional Maritime University (RMU) in Accra was identified by DFAS as the most appropriate institution to provide such training. The RMU was therefore contacted to find out the possibility of the university providing such training and also the kind of short courses that are offered at the RMU that would be suitable for the purpose. It was gathered during the enquiry that the Department of Maritime Safety of the RMU was the right place for such training. Discussions were held with the Head of Department and the information received was that:

1. Short courses (each of which last for a few days) are run by the University on weekly basis particularly from February to June.
2. Participants can select and register from the list of short courses available and their preferred dates for participation
3. Participants receive certificates after the course.
4. Specially tailored training package can be organized for groups from institutions by application through the Vice Chancellor
5. A minimum of 5 participants are however required to allow for such specially packaged training arrangement to take place.
6. Special arrangements attract different charges compared to the mainstream training programs
7. Prices of short courses are quoted in US dollars (ranging from US\$102.00 to US\$662.00 per participant from member states including Ghana) payable in the Ghana Cedi equivalence.

The conclusions drawn were that if DFAS wants to pursue this training based on the above details, a member of the Marine Safety Department at RMU will plan to carry out an inspection of the research vessel at the expense of DFAS and also full specifications and photographs of the vessel must be provided to the Maritime Safety Department, RMU. Based on the nature of this training, it was decided that DFAS participants can benefit from a package involving 5 short courses from the Marine Safety Department with a possible 6th course on Maintenance to be arranged with a different Department.

Table 1: Details of the five courses offered at RMU

Short Course	Code	Registration + Tuition (\$)	Duration
Elementary First Aid	EFA	134.00	2 days
Personal Survival Techniques	PST	134.00	3 days
Personal Safety & Social Responsibility	PSSR	134.00	3 days
Life Boat	L/BOAT	134.00	5 days
Steering (Simulator)	STEERING	102.00	5 days

DFAS has written to ask the office of the Vice Chancellor of UCC to send an application letter to the Department of Marine Safety, RMU through their Vice Chancellor requesting for assistance in training some personnel of DFAS in manning a research vessel in selected short courses.

4.2 Activity 1.2.2: Operationalization of the Centre for Coastal Management

As part of plans for the operationalization of the Centre for Coastal Management, the Coastal Management Specialist from URI, Prof. Richard Burroughs, who has been providing support to the Centre for Coastal Management visited the project once again from the 15th to 27th of May, 2016. As part of activities planned for his visit, he participated in a field trip to Half

Assini in the Western Region to engage with stakeholders in relation to the restoration of the Awiane lagoon. He paid courtesy calls on the DCE of Jomoro District at Half Assini and also the chief of Half Assini and his council of elders as well as meeting with fishing community representatives. The DCE expressed his interest and joy in the project and pledged his support for the project on behalf of the Assembly. The chief and the council of elders also expressed their willingness to participate in the project because restoration of the Awiane lagoon was a concern that had already been raised by the youth of the community. The elders and members of the fishing community equally expressed their readiness to be part of the project, as the current state of the lagoon impacts negatively on their lives. The consultant who conducted research on the ecological status of the Awiane lagoon accompanied the Coastal Management Specialist and DFAS representatives to Half Assini to present his findings on the baseline studies he carried out on the current state and restoration of the Awiane lagoon to foster stakeholder buy-in.

The Coastal management Specialist also paid courtesy calls to some important personalities of UCC including the Vice Chancellor, Pro-Vice Chancellor, the Registrar, Provost of the College of Agriculture and Natural Sciences, Dean of the School of Biological Sciences and Chairman of the Centre for Coastal Management Board. He also met with DFAS faculty to present updates on the work he is doing for the Centre and also solicit inputs from members of DFAS. He also continued with the review of the strategic plan for the Centre for Coastal Management. Prof. Richard Burroughs gave a public lecture on the topic: “Changing the Rules for Coastal Lands and Water”.

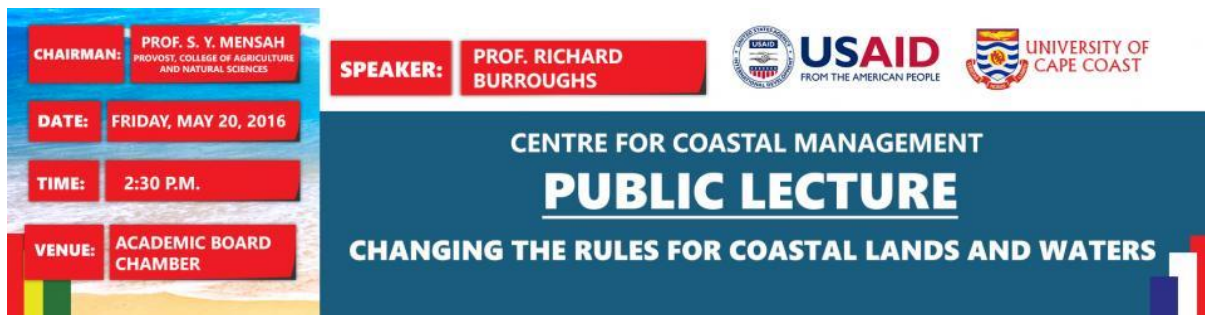


Figure 11: Website banner used for publicity of the public lecture on DFAS website



Figure 12: Prof. Richard Borroughs

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

As part of activities to select suitable candidates for the award of postgraduate scholarships to enroll in PhD and MPhil programs at UCC, positions were advertised for eligible candidates to apply for scholarships. Applications received for the award of scholarships to pursue postgraduate studies were shortlisted and the shortlisted applicants were invited for interviews. After a very competitive exercise, successful applicants (5 PhD students and 5 MPhil students) were selected and informed about their success and have been encouraged to apply to the University for formal admission if they have not yet done so. These students are expected to start with their studies at the beginning of the next academic year in August/September this year.

Table 2: List of PhD students admitted with full scholarship from USAID

No	Name	Gender	PhD Program
1	Fredrick Ekow JONAH	M	Oceanography & Limnology
2	Gerdrude Lucky Dali	F	Integrated Coastal Zone Mgt.
3	Joseph Onwona ANSONG	M	Integrated Coastal Zone Mgt.
4	Miriam Yayra AMEWORWOR	F	Fisheries Science
5	Rhoda Lims Osae SAKYI	F	Aquaculture

Table 3: List of MPhil students admitted with full scholarship from USAID

No	Name	Gender	MPhil Program
1	Ms. Success Adjeley Sowah	F	Oceanography & Limnology
2	Ms. Paulina Okpei	F	Fisheries Science
3	Mr. William Dogah	M	Aquaculture
4	Mr. Nunana Agbemebiese	M	Integrated Coastal Zone Mgt.
5	Ms. Justina Ekuwa Annan	F	Integrated Coastal Zone Mgt.

4.4 Activity 1.2.4: Undergraduate Research Grants

During the period thirty (30) undergraduate student grant beneficiaries of the DFAS successfully completed/passed their undergraduate dissertations. Each student had a grant award of US\$ 500 to specifically support field research, covering transportation, collection of samples and printing costs. The research topics completed and assessed are as follows:

Table 4: Undergraduate Research Projects

NO	NAME OF STUDENT	TITLE OF RESEARCH PROJECT	SUPERVISOR
1	MICHAEL AMEKUDZI	OBSERVATIONS ON THE BIOLOGY OF <i>CHLOROSCOMBRUS CHRIYSURUS</i> , <i>TRACHINOTUS OVATUS</i> AND <i>SARDINELLA SPP</i> FROM BEACH SEINE CATCHES IN CAPE COAST.	PROF. JOHN BLAY
2	CHRISTIAN KWAME BOAME	LENGTH FREQUENCY DISTRIBUTION AND LENGTH-WEIGHT RELATIONSHIP OF CUTTLEFISH (<i>SEPIA OFFICINALIS</i>) FROM BEACH SEINE LANDINGS AT CAPE COAST.	PROF. JOHN BLAY
3	EVELYN NHYIRABA QUARSHIE	LENGTH-WEIGHT RELATIONSHIP AND SIZE DISTRIBUTION OF CUTTLEFISH (<i>SEPIA OFFICINALIS</i>) FROM ANLO BEACH SHAMA, IN THE WESTERN REGION OF GHANA.	PROF. JOHN BLAY
4	MICHAEL FRIMPONG APPIADU	OCCURRENCE, DIVERSITY AND FOOD OF JUVENILE MARINE FISHES IN BENYA LAGOON AND KAKUM ESTUARY, GHANA.	PROF. JOHN BLAY
5	ABENA BOATEMAAH SARPONG	ECOLOGICAL ASSESSMENT OF THE LITTORAL FLORAL COMMUNITY OF THE FOSU LAGOON, GHANA.	DR. DENIS AHETO
6	GREGORY ESSIEH	ECOLOGICAL ASSESSMENT OF THE ZOOPLANKTON COMMUNITY OF THE FOSU LAGOON, GHANA.	DR. DENIS AHETO
7	OBED ADJEI	ECOLOGICAL ASSESSMENT OF THE FISH POPULATION OF THE FOSU LAGOON, GHANA.	DR. DENIS AHETO
8	IRENE OWUSUWAAH	ECOLOGICAL ASSESSMENT OF THE BENTHIC FAUNA COMMUNITY OF THE FOSU LAGOON, GHANA.	DR. DENIS AHETO

NO	NAME OF STUDENT	TITLE OF RESEARCH PROJECT	SUPERVISOR
9	PERPETUAL MARFO	ECOLOGICAL ASSESSMENT OF THE COMMUNITY STRUCTURE OF PHYTOPLANKTON IN FOSU LAGOON.	DR. DENIS AHETO
10	PROSPER ASARE	EFFECTS OF TIDAL EXPOSURE ON SHELL MORPHOMETRICS AND ASPECTS OF REPRODUCTION OF THE MANGROVE OYSTER (<i>CRASSOSTREA TULIPA</i>) IN BENYA LAGOON.	PROF. KOBINA YANKSON
11	MICHAEL FEYI	THE USE OF TRADITIONAL MEANS OF TIDE PREDICTION IN ARTISANAL AND SEMI-INDUSTRIAL FISHERY IN TWO COMMUNITIES IN THE CENTRAL REGION OF GHANA.	NOBLE KWAME ASARE
12	DOMINIC DUNCAN MENSAH	HYDROGRAPHIC INFLUENCE ON THE UTILIZATION OF MANGROVE PONDS BY JUVENILE FISH ASSEMBLAGE IN THE KAKUM ESTUARY, GHANA.	NOBLE KWAME ASARE
13	KWAME ISAAC ADUTWUM	INFLUENCE OF HYDROGRAPHIC CONDITIONS ON FISH ECOLOGY IN AN ESTUARINE SYSTEM.	NOBLE KWAME ASARE
14	RUTH PRAMANG SEKYERE	CLIMATE CHANGE IN OUR BACKYARD: IN INVESTIGATION INTO HOW WARMING OF THE OCEAN THEREATENS THE PRODUCTION OF SARDINELLA IN GHANA.	DR. EMMANUEL ACHEAMPONG
15	BOATENG KUSI	MONITORING OF BEACH SEINE LANDINGS FOR TWO COASTAL FISH SPECIES (<i>BRACHYDEUTERUS AURITUS</i> AND <i>DECAPTERUS PUNCTATUS</i>) OF COMMERCIAL IMPORTANCE ALONG OLA-DUAKOR BEACHES IN CAPE COAST.	DR. JOSEPH AGGREY-FYNN
16	BERNARD YEBOAH ASSIAM	MONITORING OF BEACH SEINE LANDINGS FRO TWO COASTAL FISH SPECIES (<i>PSEUDOTOLITHUS SENEGALENSIS</i> & <i>TRICHIURUS LEPTURUS</i>) OF COMMERCIAL IMPORTANCE ALONG OLA-DUAKOR BEACHES IN CAPE COAST.	DR. JOSEPH AGGREY-FYNN
17	GABRIEL GATOR	EFFECTS OF COPEPOD INFESTATION ON THE CONDITION INDEX OF THE GARFISH (<i>ABLENNES HIANS</i>) LANDED AT THE ELMINA BARBOR.	PROF. E.A. OBODAI
18	APUGYA AYINBOYA JOSEPH	A COMPARATIVE STUDY OF CONDITION INDICES OF MALE AND FEMALE OYSTERS, (<i>CRASSOSTREA TULIPA</i>) IN NAKWA LAGOON.	PROF. E.A. OBODAI
19	SAMUEL-RICHARD BOGOBEY	ASPECTS OF THE BIOLOGY OF <i>BRACHYDEUTERUS AURITUS</i> AND <i>SPHYRAENA SPHYRAENA</i> FROM BEACH SEINE LANDINGS AT ANLO BEACH, SHAMA	PROF. JOHN BLAY
20	FREDA TAFOA	THE EFFECT OF TIDAL EXPOSURE ON ASPECTS OF GROWTH OF THE MANGROVE OYSTER (<i>CRASSOSTREA TULIPA</i>) IN BENYA LAGOON	PROF. KOBINA YANKSON
21	JEREMIAH OTEYINYE ABDULAI	THE EFFECT OF CLIMATE CHANGE ON COASTAL FISHERIES: A CASE STUDY ON COASTAL UPWELLING AND SHRIMP PRODUCTION	DR. EMMANUEL ACHEAMPONG
22	YAW YEBOAH	CLIMATE VARIABILITY EFFECT ON COASTAL FISHERIES: A CASE STUDY ON THE IMPACT OF CLIMATE CHANGE ON THE PRODUCTION OF TUNA IN GHANA	DR. EMMANUEL ACHEAMPONG

NO	NAME OF STUDENT	TITLE OF RESEARCH PROJECT	SUPERVISOR
23	AUGUSTINE M. K. ABOTSI	CLIMATE CHANGE IN OUR BACKYARD: INVESTIGATION INTO HOW WARMING OF THE OCEAN THREATENS FISHERIES PRODUCTION IN GHANA	DR. EMMANUEL ACHEAMPONG
24	EMMANUEL OBENG DEKYI	MONITORING THE BEACH SEINE LANDINGS OF TWO COASTAL FISH SPECIES (<i>GALEOIDES DECACTYLUS</i> AND <i>CARANX HIPPOS</i>)	DR. JOSEPH AGGREY-FYNN
25	PRECIOUS KORLEKIE MATEY	DETERMINATION OF TIDAL EXPOSURE LEVELS OF COLONIES OF MANGROVE OYSTERS (<i>CRASSOSTREA TULIPA</i>) AND ASSOCIATED FOULING ORGANISMS IN BENYA LAGOON, GHANA	PROF. KOBINA YANKSON
26	PETER ANNOR OBENG	DETERMINATION OF SEX RATIO AND CONDITION INDEX OF MANGROVE OYSTER (<i>CRASSOSTREA TULIPA</i>) FROM BENYA LAGOON	PROF. E. A. OBODAI
27	ADELAIDE ANSERE	MONITORING THE BEACH SEINE LANDINGS OF TWO COASTAL FISH SPECIES (<i>CYNOGLOSSUS SENEGALENSIS</i> AND <i>ALECTIS ALEXANDRINUS</i>) OF COMMERCIAL IMPORTANCE ALONG OLA-DUAKOR BEACHES	DR. JOSEPH AGGREY-FYNN
28	DELOVE ABRAHAM ASIEDU	EFFECTS OF COPEPOD INFESTATION ON SOME GILL PARAMETERS OF THE GARFISH (<i>ABLENES HIANIS</i>) LANDED AT THE ELMINA LANDING QUAY	PROF. E. A. OBODAI
29	FLORENCE DZIDZOR FLEKU	INFLUENCE OF HYDROGRAPHIC CONDITIONS ON ASPECTS OF FISH ECOLOGY IN THE KAKUM ESTUARY, GHANA	DR. NOBKE KWAME ASARE
30	ELLEN NYARKO YEBOAH	INVESTIGATING ASPECTS OF POLLUTION IN FOSU LAGOON, CAPE COAST, GHANA	DR. NOBKE KWAME ASARE

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

5.1 Activity 2.1.1: Conducting Fisheries Stock Assessment

Scientific evidence points to the fact that Ghana's marine fisheries are in crisis, with fish landings declining over the last decade. The overarching objective to arrest the decline in the fisheries industry should be the long-term conservation and sustainability of the exploitation of Ghana's fish stocks. Any deliberations to achieve these objectives urgently require the best and up to date information about the stocks through fisheries stock assessment research.

In recognition of the need to close the gap of the requisite information for fisheries management in Ghana, the project is undertaking fisheries stock assessment research through a short-term consultancy by a Technical Assistant. The primary objective of the fisheries stock assessment is to provide information on some selected commercially important marine fish stocks in Ghanaian coastal waters to facilitate sustainability and conservation of the stocks. The assessments are concentrated at 6 designated fish landing ports, namely, Elmina, Sekondi, Half Assini, Apam, Tema and Keta for data on selected fish stocks. Data is being collected on daily catch (kg) per canoe, semi-industrial boat and industrial boat; size distribution, maturity stages; length-weight relationships from beach seine and offshore catches; salinity and surface temperatures of water for monitoring upwelling indices.

Preliminary analysis of the data collected so far indicate decline in the stocks possibly due to increased fishing effort. The mean catch per unit effort (CPUE) values were not uniform (ranged between 0.097 and 0.459 kg per canoe per day) which might indicate that the ichthyomass distribution is not uniform. In addition, the modal sizes of most of the targeted species fall below the minimum permissible landing sizes of commercially important fish species proposed in section 139 (1) of the Fisheries Act and also enshrined in the Fisheries Regulations 14 (1). In order to reverse the decreasing trend, some bold and immediate management interventions may have to be undertaken if the future livelihood support provided by the fisheries are to be sustained. The highest fishing effort of 1,680 boat days was estimated for canoes at the Sekondi landing beach.

In addition, the data obtained covered various aspects of the biology of the targeted species including, the length-weight relations, sex-ratios, condition factor, food and feeding habits, sexual maturity, spawning and fecundity. The stomach content analysis shows that the food spectra are mixed with general carnivorous diet bias by most of the species investigated with distinct preferences for fish and shrimps. This bias across the majority of the species examined could in the long run exacerbate competition among them.

The collection of monthly length-frequency data and previous catch-effort data from the fisheries are being compiled to allow application of the length-based FAO FISAT program to estimate growth and mortality parameters and the appropriate Surplus Production Model for Maximum Sustainable Yield (MSY) estimation respectively. It is expected that the routine

monthly fishery surveys and data collection will continue in the next quarter to confirm and build upon the preliminary data collected and findings.



Figure 13: Bumper fish harvest from beach seining activity at Atwenbanso landing beach, Jomoro District: Suspected outcome of ban on light fishing in the District. July 2016

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

During the period under review, thirty-three landing beaches were studied in the Central and Western Regions. The following are some of the key achievements during the period in question:

- The Cape Coast Metropolitan Assembly has agreed to supply waste bins to Cape Coast landing beaches to improve on the sanitation conditions in the beaches. USAID/UCC Project Manager officially communicates with MCE on behalf of Fisheries Governance Team for signing off dates.
- Traditional Authority agrees to discuss implementation of ban on monofilament nets and use of other unauthorized fishing accoutrement with Local Authority and the Fisheries Commission.
- Local Administration at the Abura/Asebu/Kwamankese (AAK) District is linked to the local Traditional Authority. District Chief Executive agrees to address issues on bad

fishing methods, environment & sanitation and MASLOC loans to fish processors is agreed to be addressed by DCE. Request has gone to traditional leaders to donate land for public toilets.

- The Komenda/Edna/Eguafo/Abura (KEEA) Metropolitan Assembly at validation meeting with local traditional authority to implement by-laws on the following: address discrepancies in the distribution of pre-mix fuel; keeping register of canoes in KEEA; sorting out toilet facilities at the beaches; regulating fishing activities; pre-departure inspection and post/arrival inspection of canoes and instituting collaboration between Department of Fisheries & Aquatic Sciences, UCC and KEEA to address fishing and environment issues.
- Children activity of fishing bivalves from the sea at low tide for domestic use in Western region termed as ‘Child work’ is pointed out to traditional authority for further discussion and possible ban with by-laws from Local Administration.
- Crocodile ponds with potential tourists attraction is agreed on by local authority for development in Ellembele District.



District Chief Executive (DCE) of Abura/Asebu/Kwamankese (AAK) District at Fisheries Governance Validation Meeting at Moree (June 2016).
 Seated up: Traditional Authority at Moree
 Inset: Section of Fisheries Practitioners and Opinion Leaders in AAK District .

Figure 14: District Chief Executive (DCE) of Abura/Asebu/Kwamankese (AAK) District at Fisheries Governance Validation Meeting at Moree (June 2016)



Figure 15: Children perform 'oyster dance' at low-tide level to harvest oysters

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

This activity primarily aims to provide information on some commercially important marine fish stocks in Ghanaian coastal waters to facilitate sustainability and conservation of the stocks. The study is being done in selected landing sites (Figure 17) with targeted species belonging to the family Carangidae, Sparidae, shrimps and cuttlefish (Sepiidae). Preliminary analysis of the data collected within the period indicate decline in the stocks possibly due to increased fishing effort. The mean CPUE values were not uniform (ranged between 0.097 and 0.459 kg per canoe per day) which might indicate that the ichthyomass distribution is not uniform. In addition, the modal sizes of most of the targeted species fall below the minimum permissible landing sizes of commercially important fish species proposed in section 139 (1) of the Fisheries Act, 2002 (Act 625) and also enshrined in the Fisheries Commission Regulation 14 (1). In order to reverse the decreasing trend, some bold and immediate management interventions may have to be undertaken if the future livelihood support provided by the fisheries are to be sustained. The highest fishing effort of 1,680 boat days was estimated for canoes at the Sekondi landing beach with corresponding highest Boat Activity Coefficient (BAC) of 0.45.



Figure 16: Active beach by day

In addition, the data obtained covered various aspects of the biology of the targeted species including, the length-weight relations, sex-ratios, condition factor, food and feeding habits, sexual maturity, spawning and fecundity. The stomach content analysis shows that the food spectra are mixed with general carnivorous diet bias by most of the species investigated with distinct preferences for fish and shrimps. This bias across the majority of the species examined could in the long run exacerbate competition among them. The sparid, *Dentex ronchus* and the carangid, *Trachurus traciae* showed the most stenophagy of all the species due to the narrow spectrum of food items they consumed.

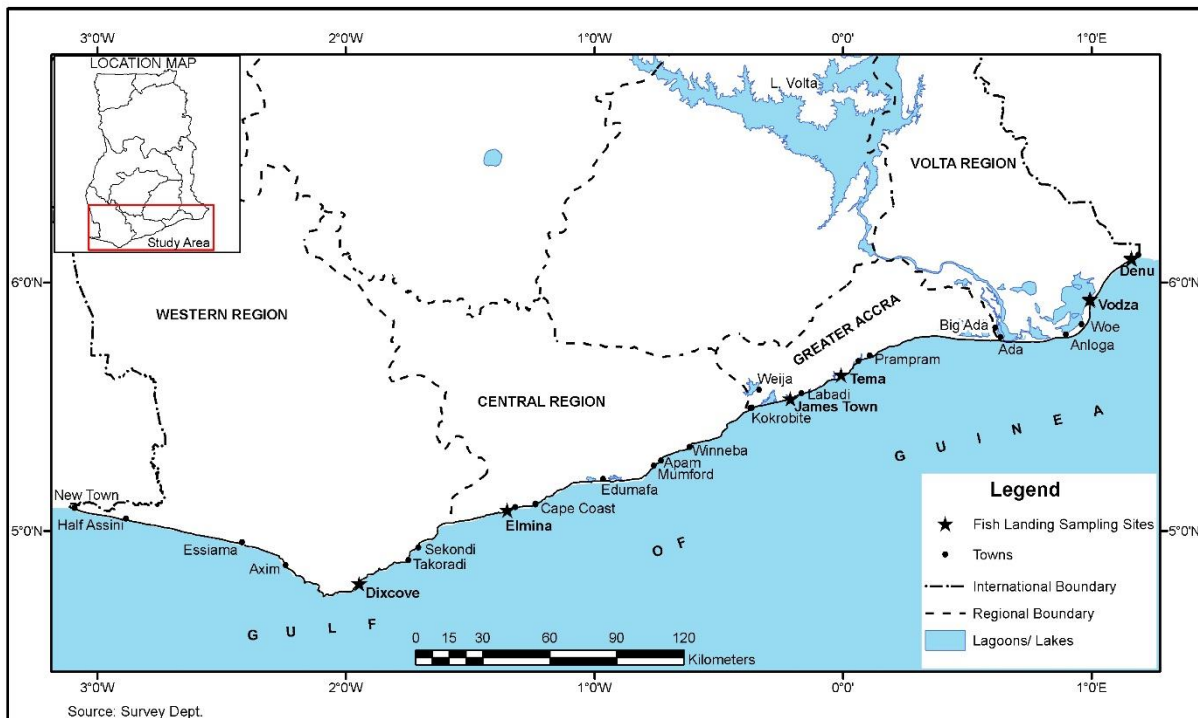


Figure 17: Coastal Map of Ghana showing fish landing ports and selected sampling stations

The collection of monthly length-frequency data and previous Catch-effort data from the fisheries are being compiled to allow application of the length –based FAO FISAT program to estimate growth and mortality parameters and the appropriate Surplus Production Model for MSY estimation respectively. It is expected that the routine monthly fishery surveys and data collection will continue in the next quarter to confirm and build upon the preliminary data collected and findings.

5.4 Activity 2.1.4: Analysis of Value Chains of Fish Trade

This activity was latent during the quarter under consideration but it is envisaged that some PhD students will initiate research in this field from the 2016/2017 academic year.

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

The project is embarking on the ecological restoration of the Half Assini lagoon as a pilot project to demonstrate the monitoring of the biodiversity and health of coastal ecosystems. As part of that activity a team made up of researchers from the University of Cape Coast and the Kwame Nkrumah University of Science and Technology (Project Technical Assistants) and the Coastal Management Specialist from the URI embarked on a two-day visit to Half Assini

to strengthen the collaboration between the project and the District Assembly in Half Assini, the Traditional Authorities as well as the local fishing community and to discuss ways forward for working together towards the restoration of the lagoon. On arrival in Half Assini, the team first went on a tour around the lagoon to assess the state of the water body and the extent of pollution and to have a general impression on what can be done to bring the lagoon back to a desirable condition. The team gathered some information on the social, cultural and economic benefits derived from the lagoon by the surrounding community.

After the tour round the lagoon, a stakeholder meeting to discuss what could be done on the status of the lagoon was organized at the Jomoro District Assembly. In the absence of the DCE, the meeting was chaired by the District Coordinating Director of the Jomoro District Assembly who expressed his joy on behalf of the all members of the Assembly about such an important initiative by the USAID/UCC project. The Coordinator for the Centre for Coastal Management used the opportunity to highlight on the importance of the lagoon as spawning grounds for all kinds of aquatic organisms, for flood control, provision of fresh air and the protection of the land against storms and tidal waves. He further pointed out findings of an earlier project which was undertaken in 2013 to investigate the environmental issues in six communities including Half Assini led to the adoption of the Half Assini lagoon for special attention by the DFAS and the CCM. The Coordinator asked all stakeholders to do their part to save the lagoon because of its aesthetic value, ecological and economic importance. It is anticipated that the success of such a project will provide a model for other communities. The team from KNUST who recently conducted research in the lagoon made a presentation on their initial findings about the current status and use of the lagoon. Findings indicated that (1) The lagoon currently measures about 3.5 hectares indicating a reduction in size mainly due to siltation and the dumping of refuse and other wastes causing over-flooding (2) number of species has reduced (3) fishing has reduced in the lagoon leading to loss of economic opportunity. The presentation ended with the conclusion that community members were willing to support all efforts aimed at changing the current state of the lagoon for the better.



Figure 18: Awiane lagoon at Half Assini in the Western Region, Ghana



Figure 19: Current state of some parts of the Awiane Lagoon



Figure 20: Participants at the stakeholder meeting at the Jomoro District Assembly, Western Region, Ghana

Summary of key issues (poor sanitation, defecation, dumping of refuse, piggery on the banks and reduced size of the lagoon) for consideration regarding behavior change in the practices around the lagoon was given by the director of the Centre for Coastal Management. It was suggested that the community should refrain from dumping of refuse in the lagoon, move pig farms away from the banks of the lagoon and stop defecation near the lagoon but of course that also required some actions by the District Assembly and community members themselves like the community members joining hands to clear the plastic wastes in the lagoon and District Assembly providing the community with a new dumping site. The District Coordinator hinted that it would be difficult for the District to provide financial support at that moment since the District had exceeded their budget but he however promised the Assembly's support for other logistical needs to the community. The Coastal Management Specialist expressed his

appreciation to the community for attending the meeting in their numbers and pledged his continuous support to make the change happen by all means possible.

5.6 Activity 2.1.6: Developing Marine and Coastal Fisheries Database

A consultant has been contracted to work closely with DFAS team members on the activity involving the development of a marine and coastal fisheries database. A preliminary design of the website to host the database has been developed by the consultant and discussed with DFAS faculty for their inputs. Activity team members met to discuss the next steps to be followed in efforts to have the database to become fully operational. It has now been decided that the project organizes a workshop at the national level preferably in Accra that will bring together potential collaborators for a national dialogue on sharing of scientific data and information and to develop modalities for the sharing of information as well as issues to deal with access to the database. In terms of accessibility, institutions will have varying levels of accessibility depending on the extent of their contributions. This national level stakeholder meeting has been scheduled to take place in August this year in Accra. In preparations towards the organization of this workshop invitation letters are being prepared to be sent out to the relevant organizations well in advance. Memorandum of Understanding (MoU) between the project and all partners were drafted and finalized after clearance by the UCC Legal Section. However, the project envisages a challenge where potential partner institutions will not be very much willing to participate in the development of the database and therefore their readiness to contribute and share data and information that they have. Despite the challenge, bringing the stakeholders together to dialogue is an important step moving forward. The project plans to discuss all issues that may hinder the progress of this activity and also bring about conflicts in the upcoming workshop to ensure that an operational database.

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

Developing a manual and conducting training on Integrated Coastal Management has the broad aim of building the capacity of stakeholders in governmental and non-governmental agencies, and fishing communities to better understand the nature of the coastal zone, be able to identify challenges, and learn basic skills for addressing problems. Specifically, this activity is aimed at developing a five-day training manual in ICM for governmental and non-governmental officers whose mandate relate to the coastal zone and community-based groups highlighting the coastal environments found in Ghana, methods of assessing the condition of coastal environments and their resources, integrated management approaches and coastal management instruments. The project identified and signed a working contract with an ICM expert to provide technical assistance in developing a training manual and materials and conduct training on Integrated Coastal Management. The training is targeted towards spatial planners, disaster

managers, District, Municipal and Metropolitan Assemblies, environmental and fisheries officers, fishermen/fishmongers, and community-based fisheries and coastal management groups. The ICM consultant is still working on the development of the manuals and the other training materials which will be tested in the next quarter.

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

The project has signed a MoU with the Department of Fisheries and Water Resources (DFWR), University of Energy and Natural Resources (UENR), Sunyani to collaborate with the DFWR to develop materials and conduct training on fisheries management. The purpose of the MOU is to frame collaboration between DFAS and DFWR of the (UENR) on the development of joint research activities and professional training programs within the context and objectives of the project. Both institutions are collaborating on the following activities:

- Curriculum development on fisheries management, notably practical field exercises for students and professionals
- Targeted student data collection on coastal zone and fisheries and
- Field research projects involving scientists on relevant fisheries monitoring programs in inland and coastal areas of Ghana.

The two institutions are developing a training manual on fisheries management that targets lower and middle level governmental and non-governmental officials working in the fisheries sector as well as community-based fisheries management groups. The program will also produce fisheries management materials including PowerPoint presentations of the modules, videos, charts and other relevant material and test the manual on a stakeholder group in the Western and Central Regions. Work on the development of the manuals and the other training materials are still ongoing. The materials will be tested in the ensuing quarter.

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

Last year, three senior members of DFAS academic staff attended a training program in Adaptation to Climate Change in Coastal Communities at URI. On their return, the group conducted a review and updated the existing training manuals and other materials on climate change paying attention to the knowledge gained by participating in the course at URI. The new climate change curricula will be used this year in the upcoming training program on climate change adaptation and resilience in coastal communities in Ghana. Last year, a consultant was contracted to conduct this training program for DFAS. In this year's training program, DFAS plans to again hire the services of a consultant who will lead this activity but with active participation of the DFAS staff who took part in the training at URI. Terms of Reference for prospective consultants were drafted by DFAS and a call for application to conduct the training was widely advertised. Applications have been received which are yet to be shortlisted to select the most suitable applicant for the task.

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

The project advertised for GIS experts to apply for a short-term technical assistance to provide services related to the application of GIS to fisheries and coastal management. The GIS expert was expected to work in close collaboration with the Department of Geography and Regional Planning (DGRP) of the University of Cape Coast. The applications received were shortlisted and a successful applicant was selected to provide GIS training services to the project. The consultant initially conducted a GIS training needs assessment for DFAS and CCM staff and developed training course curriculum, course notes and course exercises based on the findings from the needs assessment. A GIS Specialist from the Department of Geography and Regional Planning, UCC carried out an expert review of all the training course materials and provided a number of suggestions to improve the materials.



Figure 21: Research assistants filling questionnaires during the GIS needs assessment

The course is designed to develop the technical and soft skills of participants. It will provide participants with fundamental skills in GIS, Remote Sensing, teamwork, leadership and communication. It will enhance the intellectual capacity of participants to make systematic analysis of complex dynamic problems using GIS. The course consists of two interrelated components: (1) a theoretical component which focuses on the concepts and (2) a practical component which aims at developing hands-on skills in using GIS tools. The training is expected to take place at the Centre for Coastal Management premises, UCC in the coming quarter.

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

A consultant is leading the various components of this activity in the second year of the project based on the conclusions and recommendations made after the national stakeholder fisheries and coastal management dialogue held in Accra last year. So far, two research briefs have been written, a weekly radio program on fisheries is on-going, four newspaper publications have been made and a meeting of fisheries and coastal environmental researchers has been organized. Outstanding activities to be carried out during the last quarter of project year two are the continuation of the media engagements and dialogues with other institutional stakeholders and a compilation of photo albums of landing beaches of Ghana. An introductory policy brief that provides a general overview of the policy and research issues that confront Ghana's fisheries and the coastal environment as well as a sanitation brief that captures some scenes and makes recommendations for a bottom-up approach to managing this menace have been produced. These provide the processes and contribution of this project to confronting the issues. As a way of enabling DFAS to provide an effective extension service using local radio stations and to dialogue with community-based fisheries management groups, a MoU has been established with the ATL FM at UCC. Through this MoU, a faculty member of DFAS and a chief fisherman are now panellists, adding new experiences and dimensions on the program. This program can be accessed on the broadcast days at ATL FM 100.5MHz with online streaming at <http://www.atlffmonline.com/radio>. The newspapers are being engaged to broadcast the policy and research issues to the wider public and to keep building the momentum for a continuous dialogue on fisheries and coastal environmental issues.

The need for researchers to conduct demand driven research to improve the lives of our people has been the challenge of many research stakeholders. As part of project activities last year, data and information were collected to facilitate research and policy dialogue among fisheries and coastal environmental stakeholders. As a follow up on advancing the data and information collected for fisheries and coastal management policy formulation, the project organized a two-day scientific meeting in Cape Coast which brought together research partners to deliberate on some research issues. The theme for the meeting was: "*Sustaining Fisheries and the Coastal Environment through Research*". The meeting was aimed at harnessing national expertise and resources to start to produce the much needed scientific information to better manage the fisheries and coastal environment in Ghana. It was attended by 16 participants from the following institutions: University of Cape Coast, Kwame Nkrumah University of Science and Technology, University of Ghana, University for Development Studies, University of Energy and Natural Resources, Water Research Institute (CSIR), Ministry of Justice and Attorney General's Department, Fisheries Commission and the Media.

Research issues for discussion in the meeting included:

- What triggers the occurrence of mats of seaweeds in Ghanaian waters and how can it be controlled? Does this weed have any economic value that can be utilized by the coastal communities?
- What are the tree species, energy content and efficiency of wood used in smoking fish in Ghana? What are the cultural underpinnings to the use of these species? What is the

relationship between wood type, smoking method, smoker type and polycyclic aromatic hydrocarbon (PAH) and histamine concentration?

- Assess the spatial and temporal roles and interests of women in fisheries and coastal zone management/Explore the changing gender roles and dynamics in fisheries and coastal zone management
- Assess the spatial and cultural differences, gender roles and dynamics in sanitation among coastal communities
- Assess the potential for mariculture as an alternative to capture fisheries.
- Determine sustainable means of financing fisheries activities in Ghana
- Document and assess fish storage practices among the coastal communities of Ghana.
- Document and quantify the barter trade being practiced in the fishing communities (e.g. fish for food stuff; Fish for Sex....)
- Assess and develop a market matrix of the fish trade in Ghana.
- How to address political interference in the supply and sale of premix fuel
- Assess and quantify postharvest losses in the fishing industry

Following the identification of research issues, five research teams were formed with the appropriate expertise to facilitate and lead research in the identified thematic areas. The participants agreed to establish a society to facilitate fisheries and coastal environmental research in Ghana. Various working groups were established to stir the members towards the achievement of the research objectives and the formal launch of the society in April, 2017.



Figure 22: Participants of the National Scientific Meeting on Fisheries and the Coastal Environment

6.6 Activity 2.2.6: Building Institutional Partnerships and Collaboration

During the quarter under review, the project and UCC for that matter, hosted the President of the University of Rhode Island (URI) and his team made up of the Associate Dean of Extension at the College of Environment and Life Sciences, an Adjunct Professor of Africana Studies and Special Advisor to the President, the Executive Director of the Coastal Resources Center, the Chief of Party of the USAID/Ghana Sustainable Fisheries Management Project (SFMP), the Senior Fishery Advisor to the USAID/Ghana SFMP and the Chief of Party of the USAID/West Africa ASSESS Project. The main purpose of the visit was to further develop the existing partnership with the UCC. The visit was reciprocated by high level delegation from the UCC to URI and provided an opportunity to explore expanded partnerships with the UCC, including academic and student exchanges among other potential opportunities. The URI President gave a public lecture at the Main Auditorium of the University of Cape Coast entitled: “Internationalization and Globalization: Education, Research, Diplomacy, and Intelligence”. The President noted that the current and future global context for higher education presents both substantial challenges and new opportunities. He stressed however, that diplomacy and socialization, although less frequently emphasized, are also critical roles that university partnerships can provide.



Figure 23: Prof. D. D. Kuupole welcomes URI team at the UCC



Figure 24: Signing of MoU between UCC and URI

After the lecture, a MoU was signed between the Coastal Resources Center of URI and the Department of Fisheries and Aquatic Sciences and Center for Coastal Management of UCC. Signing of the MOU symbolizes cooperation and mutual consent of the two parties to establish cooperative relations, and to strengthen synergies between the URI Coastal Resources Center and UCC Department of Fisheries and Aquatic Sciences in the implementation of each other's USAID-funded projects. Facilitating the symbolic MOU signing, the Senior Natural Resources Management & Energy Advisor of the Economic Growth Office of the USAID/Ghana Mission, Robert Buzzard, expressed continued commitment of the US Government and the USAID Mission to support government and university strengthening efforts and industry involvement to rebuild fish stocks and catches, thereby contributing to poverty and hunger reduction. Mr. Buzzard emphasized that promoting higher education and research is a critical step for making informed science-based decisions for sustainable management of the fishery sector.

In May, 2016, final year DFAS students visited the Sustainable Fisheries Management Project (SFMP) office in Accra where they met both the SFMP and the Netherlands Development Organization (SNV). The field visit was organized for the Integrated Coastal Zone Management (ICZM) II course taken by final year Fisheries and Aquatic Sciences students of the School of Biological Sciences, UCC. Students were briefed by way of presentations on critical issues regarding sustainable and integrated approach to managing Ghana's fisheries by the SFMP (by: Najih Lazer, Brian Crawford, Kofi Agbogah) whereas officials of SNV (Director and one senior staff) shared with the students the innovative technology they were using to develop energy efficient and climate smart stoves for smoking fish.



Figure 25: Final year DFAS students at the SFMP office in Accra

During the period under review (In July), SFMP-URI collaborated with DFAS/UCC to organise the second leadership for fisheries management course in Takoradi at Raybow International Hotel in Takoradi in the Western Region of Ghana from 11th to 16th July 2016 through a collaboration between USAID/Ghana’s Sustainable Fisheries Management Project (SFMP) - University of Rhode Island (URI), and the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project implemented by the Department of Fisheries and Aquatic Sciences (DFAS) - University of Cape Coast (UCC). The objective of the course was to equip participants from the Ministry of Fisheries and Aquaculture Development, Fisheries Commission, NGOs, researchers and local communities with knowledge of processes for implementing management activities in pursuing management objectives for Ghana’s fisheries resources. The main objective was to transfer the core competencies of fisheries management planning and implementation to these organization representatives so as to enable them facilitate participatory processes with stakeholders. The ultimate output involved facilitating the development and implementation of fisheries management plans at the local

level and increasing effective dialogue between stakeholders on moving forward with the implementation of Ghana's fisheries management plans for the marine sector.

The course was led by three facilitators from the two universities, and attended by over twenty participants from coastal communities around the Pra and Ankobra Estuaries, fisheries oriented NGOs (Hen Mpoano and Friends of the Nation), Chief Fishermen from the Central and Western Regions, Fisher Associations (Trawlers, Inshore, Inland, Processors), Fisheries Commission and University of Cape Coast. In attendance from UCC were Mr. Godfred Ameyaw Asiedu, a facilitator, and Dr. Isaac Okyere, a participant, while the two facilitators from URI were Dr. Kathleen Castro and Glenn Ricci.

The course concentrated on eliciting leadership responsibilities for managing Ghana's fishery by the various stakeholders through conceiving a vision, team building, negotiation skills, conflict resolution, facilitating a management plan, among others. Depending on the origin, participants were constituted into three groups namely the National Fisheries team, the Pra Estuary team and the Ankobra Estuary team, with each team tasked to develop a process for facilitating a fisheries management activity in their fishery and present at the end of the training. On the final day of the training, the National team presented their strategies to tackle the use of chemicals and explosives in Ghana's artisanal fisheries while the Pra team presented their process to facilitate the development of a management plan for the estuary. The Ankobra team, led by Dr. Isaac Okyere presented on how they will facilitate the establishment of a Community Based Fisheries Management Committee (CBFMC) for the Ankobra Estuary which has already began, and further facilitate the development a management plan.

Certificates were presented to the participants at the end of the training. It is hoped that DFAS-UCC will take over the leadership for fisheries management course in the coming years and work together with potential facilitators from local NGOs and the fisher folk to offer the training.



Figure 26: Participants at the Fisheries Leadership Course

The Centre for Coastal Management (CCM) and Department of Geography and Regional Planning are collaborating with the Sustainable Fisheries Management Project (SFMP) in an effort to develop capacity of University of Cape Coast (UCC) on the use of GIS and Remote Sensing tools as part of the SFMP's activities. The project has coordinated with UCC to employ the use of Unmanned Aerial Vehicle (UAV) flights to capture ground control points and refine

vertical accuracy of imagery in the Western/Central Regions of Ghana. The activity paid particular attention to one coastal lagoon selected by CCM for management and restoration under the USAID/UCC Fisheries and Coastal Management Capacity Building Support Project.



Figure 27: Use of UAV for mapping Awiane Lagoon in the Jomoro District, Western Region, Ghana

From the 17-24th May 2016, the Project Manager, Dr. Denis Aheto accepted a fully-sponsored invited visit to present the USAID/UCC Project on Fisheries and Coastal Management at the University of Makerere in Uganda under the auspices of the Regional Universities Forum (RUFORUM).

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), established by ten Vice Chancellors in 2004, is a consortium of 60 African universities operating within 25 countries spanning the African continent. RUFORUM is coordinated by a Secretariat hosted by Makerere University in Kampala, Uganda. RUFORUM supports universities to address the important and largely unfulfilled role that universities play in contributing to the well-being of small-scale farmers and economic development of countries throughout the sub-Saharan Africa region. The consortium has several unique features for building Africa's innovation capacity and for engaging universities in development process and practice; <http://www.ruforum.org/>.



Figure 28: Dialogue session at the forum

The Project Manager also used the opportunity to attend a write-shop to develop a proposal to “Train African professionals in fisheries and aquaculture” in response to a call from the European Commission to promote an “Intra-African Academic Mobility Scheme” to train PhD and Masters Students. The project, if successful, UCC will take the lead in the implementation and will work closely with five (5) other African universities in South Africa, Kenya, Uganda, Malawi, and Togo in cooperation with the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) based at Makerere University. To note that, the proposal was successfully submitted in May, 2016 awaiting outcome of the evaluations.



Figure 29: At the write-shop to develop a proposal to “Train African professionals in fisheries and aquaculture”

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

Memorandum of Understanding (MoUs) were signed between DFAS and Friends of the Nation and between DFAS and Hen Mpoano (both local NGOs), to frame collaboration between DFAS and the two NGOs focused on fisheries and coastal governance issues in Ghana. The intention was to develop joint outreach, research and professional training activities. The purpose of the MoUs was to contribute to the conservation, restoration and monitoring of coastal wetlands in Ghana. DFAS and both institutions have operationalized the MoU and are

actively collaborating on the development of wetland monitoring programs in coastal communities of Ghana. DFAS has developed a coastal zone wetlands educational curricula made up of teacher's guide, students' manuals, visual presentations, outdoor classroom and field data monitoring sheets and test questions as well as competitive scorecards for monitoring wetlands' ecological health status, governance issues and threats to the wetlands. It is expected that Friends of the Nation and Hen Mpoano will use these resources to train selected junior and high school students and communities in the Western and Central Regions to monitor the ecological health, governance issues and threats of selected coastal habitats in those regions. This Wetlands monitoring program will further collaborate with the Coastal Sustainable Landscape Project (CSLP) to provide support for additional wetland areas and communities in the Western Region. The wetland monitoring project has received approval from the Ghana Education Service. In operationalizing the MoUs, the Department of Fisheries and Aquatic Sciences organized a two-day training workshop at the University of Cape Coast to sensitize and train twenty (20) teachers from the project areas in the Central and Western Regions. The objective of the workshop was to introduce the teachers to the training modules and ecological benchmarks for monitoring coastal wetlands, identify key issues and facilitate the development of monitoring and management programs for the selected wetlands.



Figure 30: Wetlands monitoring workshop for Junior High School teachers

6.8 Activity 2.2.8: Strengthening Community-based Groups

The project intends to tackle the challenges associated with fisheries and other coastal resources management from the bottom-up approach; working with stakeholders at the community level to sustainably exploit and manage their own resources while at the same time engaging policy makers at the national level. Community-based groups need to be strengthened in various capacities to act as champions in their communities in natural resources management and to support development in their communities. Capacity needs assessments for community-based groups in 8 selected communities were conducted by the project in year one and one of the major findings was the lack of community structures with the required skills, capacity and institutional support for the implementation of sustainable coastal and fisheries resource management in the various communities. As such, one of the key recommendations of the needs assessment was to support the formation of such community-based group and build their capacity to be able to work within their respective communities. Going forward, community-based groups have been formed for this purpose. The formation of the groups were participatory in nature at community meetings as community members were allowed to choose their own group members in whom they were confident and comfortable working with.

Following from formation of the groups, community facilitators were selected, trained and dispatched into all 8 communities with the objective of supporting the revival of existing community-based groups where they existed and facilitate the formation of new groups where they did not exist. A remobilization exercise was then carried out to re-engage the communities in readiness, review community action plans and awareness created for the project activities in all communities. The selection criteria for the formation of the Community-Based Fisheries Management Groups (CBFMGs) took into account all interest groups in the communities including women, youth, religious and traditional orientation. Community members were oriented on the activities and Terms of Reference (ToRs) of the CBFMGs to gain support for the groups in the communities.

Coastal resources management guide and manual were developed as material to be used in the training of the CBFMGs. Training workshops were organized for the community facilitators, representatives of the Fisheries Commission from all participating Regions and Districts and representatives of the CBFMGs as well as training for all members of the CBFMGs in each of the selected communities to equip them with basic skills in conflict resolution, advocacy, negotiation, resource mobilization, networking and persuasive communication for coastal resource management. All CBFMGs have developed action plans for their activities within the communities which included strategies for ensuring the compliance of bye laws and regulations around effective management of the coastal resources, implementing activities that will ensure the safety and cleanliness of the shoreline and beaches and networking with external stakeholders such as the District Assemblies.

6.9 Activity 2.2.9: Promoting Supplementary Livelihoods in Coastal Communities

Promoting supplementary livelihoods in selected coastal communities in the Central and Western Regions of Ghana is one of the flagship activities of the project because if coastal community members have other sources of livelihoods and income, the pressure on fisheries resources will be reduced. To achieve this objective, the capacity of community members must be enhanced to enable them engage in other supplementary livelihood activities other than fishing. The project plans to build the capacity of community-based organizations to provide effective governance at the community level in support of coastal resource management and supplementary livelihoods in eight selected communities in the Western and Central Regions. A livelihoods consultant has been contracted by the project to provide capacity building support to selected actors in eight targeted coastal communities in snail farming, bee-keeping and oyster farming to enhance community livelihoods. It is envisaged that when supplementary livelihoods provide a second stream of income for community members, the objective of sustainably managing coastal and fisheries resources will be realized.

Activities undertaken so far by the project to realize that aim include:

Selection of communities and trainers for supplementary livelihood activities

As part of recommendations from the initial assessments carried out in all 8 communities, 3 supplementary livelihood activities were selected. These are snail rearing, bee-keeping and oyster farming. The oyster project was expected to be a pilot project since it is the first of its kind to be cultivated in Ghana. Narkwa in the Central Region was selected for the pilot oyster farming and snail rearing; Anlo Beach in the Western Region for bee-keeping; Ankobra in the Western Region for snail rearing and Half Assini in the Western Region for bee-keeping and snail rearing. Trainers were identified for the selected activities and logistical arrangements made in all 4 selected communities for the training. Community visits were organized by the livelihoods consultant and the trainers together with the Project Management Team (PMT) to introduce the supplementary livelihood activities and trainers to the community leaders. The trainers also used the visits to inspect possible sites for the various activities. Community leaders were tasked to prepare sites in readiness for the activities.

Community remobilization

Community facilitators were selected and trained by the consultant to re-engage the communities in preparation for the activities. Community-Based Fisheries Management Groups (CBFMG) were also formed to support the implementation of the activities. The lists of participants for the training for all 3 activities were compiled according to an agreed formula with the community and the leadership of the CBFMG. As part of the remobilization process, the sites selected by the various communities in consultation with the trainers as suitable for the activities were confirmed as being available and ready for use by the project.

Local market survey

The main objective of the promotion of the supplementary livelihood activities is to find a second stream of income for communities as a way of reducing the pressure on existing coastal resources. A local market survey was therefore necessary to determine the suitability and profitability of the selected trades to meet this objective. The survey was conducted on all 3 chosen activities in the Western and Central Regions to determine these variables. Initial findings suggested a marketability and profitability of commercial production of snail rearing and bee products. Bee-keeping has the potential to be developed to generate additional income for beneficiaries and open up for the participation of many more people. Oyster farming is not known apart from the coastal communities and needs to be marketed more to make it viable

especially for commercial production if the pilot becomes successful. The research also found out that the selected beneficiaries and community members were very interested in pursuing the livelihood options to improve on their quality of lives and reduce the financial burden on them and their families during the lean fishing season.

Training of actors in snail farming, bee-keeping and oyster rearing

Three out of the four communities with a total number of 60 people have so far benefited from training in bee-keeping and snail rearing. These communities are Anlo Beach for bee-keeping and Ankobra for snail rearing. The setting up of the pilot Oyster farm in Narkwa has also started and the selected trainees are undertaking the training program with the support of the trainer.

These successes have also been accompanied with some challenges:

1. The availability of trainers for the training programs especially bee-keeping and snail rearing was a challenge. This caused unnecessary delays in the training schedule. It is recommended that other trainers who would be available for the training period are identified to reduce the delays on the program.
2. Sustaining the interest of the communities that are not benefiting from the livelihoods activities was a difficult task for the community facilitators especially knowing that other communities are benefitting. Reassuring them of fact that they will benefit subsequently seemed to be make marginal impact.
3. There seemed to be other development projects engaging the same communities and working with community- based organizations as well. Perhaps the project could engage these projects to come up with an strategy that will reduce the number of organizations and staff who hold meetings and activities with the communities to reduce fatigue on beneficiaries. This has the potential to reduce interest that the communities have in the project





Figure 31: Trainers from DFAS teach oyster group how to prepare cultches for spat collection in lagoon





Figure 32: Cultches arranged on a rack ready for planting in the Narkwa lagoon



Figure 33: Two members of the oyster group carry cultches into Narkwa lagoon

APPENDICES

Appendix 1: List of indicators and third quarter 2016 results

Indicator no.	Title of indicator	Baseline	Annual target	Performance achieved in reporting period (%)	On target? Y/N	Comments
1	Quantities and/or sizes of fish landed by selected canoe fishermen in the Central and Western Regions of Ghana	To be determined	To be determined	-	Y	Work is still ongoing with the collection of daily fish catch per canoe, fish size distribution, maturity stages and length-weight relationships by the project's fish stock assessment consultant. The work is scheduled to continue until the end of the 2016 fiscal year after which averages will be calculated to have a baseline for quantities and/or sizes of fish landed by canoe fishermen.
2	Fishing Mortality at MSY (F_{msy})	To be determined	To be determined	-	Y	Work is still ongoing by the project's fish stock assessment consultant which will enable analysis of fish catch and effort data for establishment of MSY and F_{msy} . Results will be compared with that of the SFMP project.
3	Biomass to produce MSY (B_{msy})	To be determined	To be determined	-	Y	Establishment of B_{msy} will be determined from fish catch and effort data from targeted commercially important fish stocks through the work of the fisheries stock assessment consultant. Results will be compared with that of the SFMP project.

4	Number of hectares of biological significance and/or natural resources under improved natural resource management as a result of USG assistance	0	6.9 hectares	-	Y	Preliminary survey on the ecological health of the Awiane lagoon with the project's biodiversity and ecosystems health consultant has been completed. The lagoon is generally shallow with a total water surface area of 3.5 hectares and a wetland area of 6.9 hectares.
5	Number of hectares in areas of biological significance and/or natural resource showing improved biophysical conditions as a result of USG assistance	0	6.9 hectares	-	Y	Preliminary survey on the ecological health of the Awiane lagoon with the project's biodiversity and ecosystems health consultant has been completed. Number of hectares of the lagoon showing improved biophysical conditions will be determined periodically.
6	Number of training and capacity building activities conducted with USG assistance	0	5	220	Y	Eleven (11) training activities took place in the quarter under review; 1 GIS training for DFAS staff, 1 wetlands monitoring training for teachers, and 9 CBOs capacity strengthening for supplementary livelihoods training programs in selected communities in Central and Western Regions
7	Number of people receiving USG supported training in natural resources management and/or biodiversity conservation	0	150	100	Y	Nine (9) different training programs in natural resources management and/or biodiversity took place in the quarter under review. 150 (109 males and 41 females) people participated in all the trainings.

8	Number of person hours of training in natural resources management and/or biodiversity conservation supported by USG assistance	0	400	510	Y	Nine (9) different training programs in natural resources management and/or biodiversity took place in the quarter under review summing up to 2,040 person hours of training.
9	Number of individuals who have received USG supported long-term agricultural sector productivity or food security training	0	35	45	Y	The project currently supports 6 PhD students (2 males, 4 females), and 10 MPhil students (5 males, 5 females). 5 more PhD students and 7 MPhil students have been selected for scholarships to begin next academic year
10	Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	0	280	0	Y	During the quarter under review no short-term agricultural sector productivity or food security training took place.
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	15	53	Y	Eight (8) Community-Based Fisheries Management Groups (CBFMGs) have been formed in 8 selected fishing communities in the Central and Western Regions who are receiving capacity strengthening for natural resources management and supplementary livelihoods support by the project.

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	15	0	Y	The Community-Based Fisheries Management Groups (CBFMGs) are currently undergoing training to undertake natural resources management and supplementary livelihood activities in their communities. Those who will apply new technologies will be counted and reported periodically.
13	Number of members of producer organizations and community based organizations receiving USG assistance	0	200	75	Y	150 members in total in the 8 Community-Based Fisheries Management Groups (CBFMGs) formed in the 8 selected fishing communities received assistance in this reporting period
14	Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	0	200	0	Y	The Community-Based Fisheries Management Groups (CBFMGs) are currently undergoing training to undertake natural resources management and supplementary livelihood activities in their communities. Those who will apply new technologies will be counted and reported periodically.
15	Number of rural households benefiting directly from USG interventions	0	200	75	Y	150 members belonging to 150 rural households in total in the 8 Community-Based Fisheries Management Groups (CBFMGs) formed in the 8 selected

						fishing communities benefitted directly from project interventions.
16	Number of vulnerable households benefiting directly from USG interventions	0	200	20	Y	Forty (40) of those 150 rural households are vulnerable households living in the flood prone areas close to the River Pra and the Ankobra in the Western Region
17	Score, in percent, of combined key areas of organization capacity amongst USG direct and indirect local implementing partners	To be determined	To be determined	-	Y	AfricaLead has agreed to conduct an organizational capacity strengthening assessment for DFAS. DFAS is yet to decide with AfricaLead the most appropriate time for that activity.
18	Number of beneficiaries receiving improved infrastructure services due to USG assistance	0	96	105	Y	Eight (8) members of Academic Staff, 8 Research Assistants, 2 Project Support Staff, 5 Administrative Support Staff, 3 Technical Staff and 75 students in DFAS (101 in total) are beneficiaries of refurbished library, fisheries and coastal management laboratory, project vehicles and the premises of the Centre for Coastal Management.
19	Number of new research collaborations established between USG-supported beneficiaries and other institutions	0	10	30	Y	There were no such research collaborations established in the current reporting period
20	Number of scientific studies published or conference presentations given as a result of USG	0	40	5	N	No Scientific studies were published but 2 conference presentations were given by 2 DFAS academic staff at the Makerere University in Uganda in this reporting period.

	assistance for research programs					
21	Number of dialogues and stakeholder consultations held on fisheries and coastal management	0	13	8	Y	The project organized a 2-day scientific dialogue with research partners to deliberate on fisheries and coastal management research issues. The theme for the meeting was: “Sustaining Fisheries and the Coastal Environment through Research”.
22	Percentage of graduates from USG-supported tertiary education programs employed	0	20	0	N	No DFAS graduates were employed during this reporting period
23	Number of CSOs and government agencies strengthened	0	20	40	Y	Eight (8) CBOs and government agencies were strengthened through capacity building activities delivered by the project in this reporting period.
24	Total number of direct beneficiary	0	500	50	Y	Two hundred and fifty-one (251) people (101 DFAS students and academic staff and 150 training participants in the 8 selected fishing communities in the Central and Western Region) were the direct project beneficiaries.

Appendix 2: Call for Applications for Scholarships 2011/17 Academic Year



USAID | GHANA
FROM THE AMERICAN PEOPLE



UNIVERSITY OF
CAPE COAST

Call for Applications for Scholarships – Doctor of Philosophy (PhD) and Master of Philosophy (MPhil) Degrees for the 2016/2017 Academic Year at the University of Cape Coast

Background:

In support of the Government of Ghana's (GoG) initiatives on food security, the United States Government (USG) through the United States Agency for International Development (USAID) is supporting a five-year capacity building program for fisheries and coastal management in Ghana. The project contributes to GoG's overall grand fisheries and coastal development program and USAID's Feed the Future (FtF) Initiative, the USG led global hunger and food security project designed to enhance economic growth in beneficiary countries. In this context, the Department of Fisheries and Aquatic Sciences (DFAS) at the University of Cape Coast is presently leading the USAID Capacity Building Support Program for the Fisheries and Coastal Management sub-component in collaboration with coastal research institutes at the University of Rhode Island, USA.

(i) Doctor of Philosophy (PhD) Degree

Applications are hereby invited from suitably qualified candidates for the award of five (5) full scholarships to pursue PhD degrees at the Department of Fisheries and Aquatic Sciences of the University of Cape Coast in the following areas:

- *Fisheries Science – One (1) Candidate*
- *Aquaculture – One (1) Candidate*
- *Limnology and Oceanography – One (1) Candidate*
- *Integrated Coastal Zone Management – Two (2) Candidates*

The PhD study will cover a period of three (3) years, beginning the 2016/17 academic year. The scholarships cover tuition, monthly stipends, and field research grants as well as other material and technical support. Successful candidates will spend a maximum of 6 months at the University of Rhode Island in the United States to cover part of their studies.

General Requirement: Applicants must generally qualify for admission into a PhD program at the University of Cape Coast.

Specific Requirements: In addition, all applicants must satisfy the following specific requirements:

- 1) Must hold a good master's degree (Grade: B+ or A would be an advantage) from a recognized university in a relevant field of study namely:
 - Fisheries Science, Oceanography, Limnology, Aquatic Ecology, Integrated Coastal Zone Management, Coastal Resources Management, Aquaculture, Environmental Science, Environmental Governance, Marine Policy, Conservation Science or Natural Resource Management.
- 2) All candidates must submit:
 - An application letter
 - Curriculum Vitae (CV)
 - Motivation letter
 - Two letters of recommendation
- 3) Successful candidates will be expected to conduct research in one of the following thematic areas in either the Western or Central Region of Ghana. Therefore, all applicants **MUST** in addition to the above (i.e. 1 & 2), submit a 5-page research proposal on one of the following areas of emphasis:
 - i. **Fisheries Stock Assessment**
Studies will be conducted to assess the status of commercially important marine fish stocks.
 - ii. **Studies on Marine Fisheries Governance Issues**
Research in this area would involve a survey and review of various social issues in fishing communities as well as existing adaptive management strategies.
 - iii. **Research on Fish and Shellfish of Commercial Value**
Research on the coastal tilapia (black-chinned tilapia), shrimps and mangrove oysters would involve growth, reproduction and survival of juveniles and their culture potential.
 - iv. **Analysis of Value Chains of Fish Trade**
This activity will investigate the different phases of production, processing and marketing of the different commercial fish species in the country. Factors affecting the various stages in the chain will be investigated.

v. **Assessment of Biodiversity and Health of Coastal Ecosystems**

This work will involve examination of aspects of biodiversity of fish, benthic invertebrates, and mangrove communities in lagoons and estuaries to establish the scientific basis for future monitoring in view of the ongoing offshore oil and gas exploration and production. Aquatic environmental factors, occurrence of algal blooms and invasive species will also be investigated.

- 4) In addition to all of the above (1-3), all candidates seeking for scholarships must separately apply for admission to **one** of the **four** academic programs offered in the Department and **MUST** meet the admission requirements of the University of Cape Coast.

(ii) **Master of Philosophy (MPhil) Degree**

Applications are invited from suitably qualified candidates for the award of five (5) full scholarships tenable at the University of Cape Coast. The Master of Philosophy Degree study will cover a period of two academic years beginning 2016/17 academic year. The scholarships cover tuition, monthly stipends, and field research grants as well as other material and technical support to successful candidates to pursue any of the following programs of study:

- Fisheries Science
- Integrated Coastal Zone Management
- Oceanography and Limnology
- Aquaculture

Requirements:

- i. Applicants must generally qualify for admission to masters' program at the University of Cape Coast. In addition, all applicants must satisfy the following specific requirements/prerequisites:
- ii. Must hold a Bachelors' degree preferably Second Class Honours (Upper Division) from a recognized university in a relevant field of study notably Fisheries and Aquatic Sciences, Integrated Coastal Zone Management, Coastal Resources Management, Aquaculture, Environmental Science, Environmental Governance, Marine Policy, Conservation Science, Natural Resource Management among others.
- iii. All candidates must submit the following:
 - An application letter
 - Curriculum Vitae (CV)

- Motivation letter
- Two letters of recommendation

Contact:

Only shortlisted applicants will be invited for an interview after the closing date.
Females are particularly encouraged to apply.

All applications must be delivered by regular mail/ courier to:

*The Project Manager
USAID/UCC Fisheries and Coastal Management Capacity Building Support Project
Department of Fisheries and Aquatic Sciences
School of Biological Sciences
University of Cape Coast, Cape Coast
GHANA*

Deadline: 31st March, 2016.

Funding Agency: United States Agency for International Development (USAID)