UNIVERSITY OF CAPE COAST

PERCEIVED EFFECT OF THE INTEGRATED COASTAL FISHERIES GOVERNANCE PROGRAMME ON FOOD SECURITY STATUS OF FISHING HOUSEHOLDS IN SHAMA DISTRICT IN THE WESTERN REGION OF GHANA

EMMANUEL ODURO

2015

UNIVERSITY OF CAPE COAST

PERCEIVED EFFECT OF THE INTEGRATED COASTAL FISHERIES GOVERNANCE PROGRAMME ON FOOD SECURITY STATUS OF FISHING HOUSEHOLDS IN SHAMA DISTRICT IN THE WESTERN REGION OF GHANA

BY

EMMANUEL ODURO

Thesis submitted to the Department of Agricultural Economics and Extension, School of Agriculture, College of Agriculture and Natural Sciences, University of Cape Coast in partial fulfilment of the requirement for award of Master of Philosophy Degree in Agricultural Economics

JULY 2015

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature……Date:……..

Name: Oduro Emmanuel

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast

Signature:……Data:……..

Principal Supervisor: Professor J. A. Micah

Signature:……Data……

Supervisor: Dr. William Ghartey

ABSTRACT

This study sought to find out the effect of the Integrated Coastal Fisheries Governance programme on the food security status of households in shama districts. A multistage sampling technique was used to select 140 fishermen in shama district and structured interviews schedules were used to collect data from the respondents. The data collected from the respondents were analysed using descriptive statistics, and binary logistic regression analysis. A description of the Integrated Coastal Fisheries Governance programme revealed that the programme had several stages, components, actors and beneficiaries. The research also discovered that majority of the households were food insecure but the programme had a positive effect on the food security status of the fishermen. Vessel type, ownership of vessel, experience in fishing, marital status, number of dependants, age of fishing and education level of fishermen were found to be significant predictors of food security status. The study concluded that the programme had a positive effect on the household food security and a recommendation was made for a replication of the project in other regions

ACKNOWLEDGEMENTS

I wish to acknowledge my supervisors Prof J. A. Micah and Dr. William Ghartey for their effort in successfully supervising the thesis work.

I would also like to thank my friends from the Department of Agricultural Economics and Extension for taking their time out to read through the manuscript and helping me make corrections. God bless you all.

My sincere gratitude goes to Nana Konduah, Head of all chief fishermen in Western Region; Nana Pegu, Chief Fisherman for Shama fishing community, and all the fishermen who interacted with me and provided me with the needed information.

I Finally, I would like to thank my colleagues who through their advice help shape my work. God bless them all.

DEDICATION

I dedicate this work to my parents, my siblings and my friends.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ADE	Aide À La Décision Economique
ARV	Anti Retro Viral
BALANCED	Building Actors for Livelihood and Advancing Communities Excellence in Development
BBG	Barclays Bank Ghana
CBFM	Community-Based Fisheries Management
CDI	Centre for Development Innovation
CMS	Candidate Member State
CMT	Community Monitoring Teaching
CRC	Coastal Resource Centre
CSI	Coping Strategies Index
CSR	Common Service for External Relations
DANIDA	Danish International Development Agency
DG	Directorate General
DIPOCHE	Disaster Preparedness ECHO
EC	European Commission
ECHO	European Commission Humanitarian Aid Department
EDF	European Development Fund
ESF	European Social Fund
EU	European Union
FAO	Food and Agricultural Organization
FEWS	Famine Early Warning System
FoN	Friend Of Nation
FRI	Food Research Institute

FSTP	Food Security Thematic Programme
FTF	Feed the Future
FWG	Fisheries Working Group
G8	Group of Eight
GiZ	Deutsche Gesellschaft Fur International Zusammenabeit
GNCFC	Ghana National Canoe Fishermen's Council
HDDS	Household Dietary Diversity Scale
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
HIV	Human Immuno Deficiency Virus
ICFG	Integrated Coastal Fisheries Governance
ICM	Integrated Coastal Zone Management
IFAD	International Fund for Agricultural Development
IMARES	Institute for Marine Resources and Ecosystem Studies
IPTp	Intermittent Preventive treatment programme
KEEA	Komenda Edina Eguafo Abirem
LEI	Agricultural Economics Institute
LI	Legislative Instrument
MCMC	Marine and Coastal Management Committee
MDG	Millennium Development Goal
MFMRD	Ministry of Fisheries and Marine Resources Development
MoFA	Ministry Of Food and Agriculture
MoU	Memorandum of Understanding
NGO	Non-Governmental Organisation
PAI	Population Action International
PHE	Population Health and Environment

PoU	Prevalence of Undernourishment
REDD	Reducing Emissions from Deforestation And Forest
RTDI	Research Technological Development And Innovation
SADA	Savannah Accelerated Development Agency
SAEMA	Shama Ahanta East Metropolitan Assembly
SEA	Service, Efforts and Accomplishment
SFMP	Sustainable Fisheries Management Project
SFP	School Feeding Programme
SME	Small and Medium Scale Enterprises
SP	Sulfadoxine-Pyrimethamine
SPSS	Statistical Package for Social Research
STMA	Sekondi Takoradi Metropolitan Assembly
UCC	University of Cape Coast
UN	United Nations
UR	University and Research Center
URI	University of Rhode Island
US	United State
USAID	United State Agency for International Development
USDA	United State Development Agency
WFP	World Food Programme
WFS	World Food Summit
WR	Western Region
WTF	World Trade Forum

CHAPTER ONE

INTRODUCTION

Background to the study

Food security is a condition related to the supply of food, and individuals' access to it. Concerns over food (in) security have existed throughout history. At the 1974 World Food Conference the term "food security" was defined with an emphasis on supply. Food security, they said, is the “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices”.

Later definitions added demand and access issues to the definition. The final report of the 1996 World Food Summit states that food (in)security "exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Patel, 2013). Depending on the school of thought, there are either three or four pillars of food security: access, availability, utilization, and stability. But based on the widely accepted definition of food security, access is the most used pillar for measuring food security using the food (in) security scale.

Currently one billion people suffer from chronic hunger, mostly in Sub-Saharan African and South East Asia. This is exacerbated by war and drought. It was estimated that nearly 240 million people in Sub-Saharan Africa, or one person in every four, lack adequate food for a healthy and active life, and record food prices and drought are pushing more people into poverty and hunger. At the same time, the world’s population has now surpassed 7 billion and new headlines that in the past have asked “Can we feed the world” are beginning to ask the

equally important question, “how many will there be to feed?”. It is estimated that over 1.2 million Ghanaian representing 5 percent (WFP, 2009), are food insecure. Majority of these are in the three northern regions and some coastal areas of Ghana. Across the country, two million people are at risk of becoming food insecure.

It is in light of this that Feed the Future programme was launched in the spring 2009 by the Obama Administration launched with the aim of tackling food shortages leading to insecurity. Obama’s administration made a pledge of $3.5 billion over the next three years; other members of the G8 and the G20 pledged an additional $18.5 billion. The Feed the Future Initiative was created to address the immense challenges facing the global food and agricultural system. The United States was expected to contribute over $800 million toward the initiative in FY 2010. The Feed the Future initiative brings additional resources and better alignment of donor and multi-lateral coordination to the fight against global hunger, the longer term challenges of global food security, and building future markets. Food security is not the same as food self-sufficiency; the initiative and USDA supports an international system based upon commerce and trade.

In Ghana the initiative is based primary in Savannah Accelerated Development Agency (SADA) regions. The initiative in Ghana encouraged the farmers to grow maize, rice or soybeans to serve as a source of nutrition and income thereby promoting food (in) security and increased wealth. From production to marketing, Feed the Future is increasing the competitiveness of rice, maize, and soybean value chains in northern Ghana. To accomplish this, Feed the Future is increasing access to seeds and fertilizers, building and

rehabilitating irrigation systems, improving crop research and farming practices, and modernizing storage and distribution methods. Activities under Feed the Future will also incorporate information on climate vulnerabilities and other information to support sustainable food security outcomes.

The United States is not the only country in the fight against food insecurity. Many developed countries have set up bodies aimed at tackling global food insecurity especially in developing countries. DANIDA from Denmark and GiZ from Germany are some examples. International bodies such as FAO, IFAD, and EU also undertake projects aimed at tackling food insecurity, some often cooperating to perform projects. The EU has cooperative works with the WFP, IFAD and FAO in bringing relieve item, food aid and food security intervention to areas that need it most. For example, joint action between EU and its partners helped increase food production in Pakistan and helped stop three years of declining output. Food facility provided by the EU and its developing partners helped 14,000 small-holder farmers families in Guatemala to receive fertilizer and over 176,000 communal farmers in Zimbabwe.

The Sustainable Fisheries Management Project (SFMP) to be carried out in Ghana by Friend of the Nation (FoN), between 2014-2019 and funded by the United States Agency for International Development is a project in food security project in fisheries. The SmartFish project which is being carried out Indian Ocean, the Fastenopfer project in Indonesia, the SecureFish project by Food research Institute (FRI) of council for Scientific and Industrial Research in Ghana, Project for Fisheries and Aquaculture for Food Security in Indonesia are all fisheries project on food security.

In addition, Feed the Future is supporting improved governance to replenish Ghana's depleted marine fisheries, an important source of protein and a way of life for coastal fishing families. This depletion has been found to cause an increase in seasonal food shortage leading to food insecurity in the most coastal communities in western region. Through these efforts, Feed the Future, the Government of Ghana, and other donors are working to strengthen the country's agriculture and food security policy system. The programme called the Integrated Coastal Fisheries Governance programme was undertaken from 2009-2013. It was locally called *Hen Puano (our coast)* and its aim was to help coastal communities particularly fishing households which have been identified to face major food shortages or transitive food insecurity. The programme focused on fishing communities from Shama district all the way to Jomoro district in the Western Region and brought together several stakeholders from the community, district, regional and national level. The initiative also partnered other NGO's whose mandate is also in fishing. Beside its grand aim, it also fashioned out district specific programmes all aimed at supporting the country to reduce its food insecurity by half by 2015.

Statement of the Problem

Food security is an importance issue in the world today. There are about a billion people in the world suffering from hunger. Many, if not all, developed countries have some kind of programme aimed at food security and reduction in hunger. The Obama administration in 2009 launched the Feed the Future programme. Over the past few years many countries have benefited from this initiative, of which Ghana is part. In 2009, the programme along with key stakeholders in Ghana fashioned out a country-specific project called The

Integrated Coastal Governance programme. The Integrated Coastal Fisheries Governance (ICGF) was started to help improve the food security status of coastal communities, amongst other aims, by strengthening several key institutions and engaging in education and sensitization of fishery communities on important fishery issues.

Shama district was one of the districts which were chosen for the programme. Shama is a key fishing community in western region and so became a key focal point for the programme. This is because fishing households in Shama, like most of the fishing communities in western region, was identified to undergo seasonal food insecurity because of illegal fishing activities and during periods of low fish catch. So the programme sought to address the problem by putting in place certain mechanisms aimed to help solve that problem.

However, since its completion in 2013, not much is known about the programme's achievement in food security. It is not clear if its aim of helping coastal communities, like Shama which undergoes seasonal food insecurity, achieve food security has been met. So this research aims to find out if the objective of helping coastal communities achieves food security has been met. Many food security projects have achieved their desired results of reducing hunger especially in children. Unfortunately, others after evaluation have being found not to have produced the desired result and as a result cast doubt upon its appraisal and implementation process. So, it's important to perform an independent evaluation of the project to see if indeed the objectives have been met.

In addition, lots of researches have been done by measuring food security of farming households but very little research has been on fishing households. Kyaw (2009) perform a study on food security in Myanmar in farming households. Akaba (2006) used the food security scale to find food security status of farming households in Ketu district. Tollosa (1996) study highlighted that 40 percent of the sample farm households in Arsi zone undergo seasonal food shortage. Tollosa used the food security scale in his research which was done in small farm households. Wilhelmina (2008) also used the food security access scaled for her research in Northern parts of Ghana. All these researches are geared toward farming but little is known about researches on food security studies carried out on fishing households. So this research will also fill this gap by producing relevant information about that important demographic.

General Objective

The research is to ascertain the perceived effect of the Integrated Coastal Fisheries Governance (ICFG) of the Feed the Future (FtF) programme on the food security status of fishing households in Shama district.

Specific Objectives

1. To provide a description of the Integrated Coastal Fisheries Governance Programme (ICFG)
2. To ascertain the food security status of fishing households in Shama district.
3. To ascertain the determinants of food security status of households in Shama district.
4. To determine the effect of the ICFG programme on the food security status of fishing households in Shama district.

Research Question

1. What is the nature/ component of Integrated Coastal Fisheries Governance Programme?
2. What are the levels of food security amongst the fishing households in Shama district?
3. In what way has the programme had an effect on the food security status of the fishing households in Shama district?
4. What are the determinants of food security status of households in Shama districts?

Research Hypotheses

1. Ho: The households are not food secure

   H_1: The households are food secure
2. Ho: There is no perceived effect of the programme on the food security status of households

   H_1: the programme had a significant effect on the food security status of the households
3. Ho: Variables (such as average income, vessel used, ownership of vessel, age and number of dependent etc.) of households do not have influence the food security levels of households.

   H_1: Variables (such as average income, vessel used, ownership of vessel, age and number of dependent etc.) of households have an influence their food security levels of households

Significance of the Study

Food security is a major concern in global food debate. Research on food security is important in order to identify areas that need food supply urgently. It is important to know the outcome of the programme since the entire programme was to serve as a prototype for adoption and adaptation across all communities.

The programme and its outcome will serve as role model for adoption for all coastal towns in enhancing food security. So assessment of it is important to see if the programme caused its desired effect. They also intend to provide greater research insight into the initiative: its actor, component etc. The research will provide valuable information in nature and activity of Shama household. Information such as coping mechanism in periods of food insecurity can also help government and NGO, who are into food security, target specific area to enhance food security. Also, findings from this research can help inform organisation on how to strategize poverty alleviation and food security enhancement programmes so as to get the best results from such programmes. The research will provide relevant literature on food (in) security in the Western Region and Ghana at large.

Scope of the Study

The Integrated Coastal Fisheries Governance programme had several objectives but this research will focus on food (in) security alone. The programme also had several components but the study will focus on the component of fisheries governance.

Limitations of the study

The issue of language barrier was particularly critical during data collection stage. The inability of the student researcher to interact with the

respondents directly to have first-hand information served as a limitation to data collection. Most of data collected bothered on issues that happened years ago. But since most of the households do not keep records, the research depended heavily on respondents recall ability. Hence, getting actual and precise data were difficult. Most of the respondents were not forthcoming with responses because there was no monetary incentive attached to giving out the information

Definition of key terms

Based on the research objectives, the definitions of related terms used in the study were adopted as below.

Food security: Food security is defined as when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.

Food security status: Food security status is defined as the relative position of a household on the food security scale**.**

Effect: Effect is define as a change which is a result or consequence of an action or other cause

Households: A domestic unit consisting of the members of a family who live together along with nonrelatives, such as servant, and share common facilities.

Determinants: A factor which decisively affects the nature or outcome of something.

Evaluation: Evaluation is a systematic investigation of a subject's merits, worth and importance, using criteria governed by a set of standards

Organisation of the study

The study is structured into five major chapters. Chapter One presents introduction of the study, the problem statement and study objectives, statement of hypothesis, significance of the study, variables of the study and limitations of the study. Chapter Two reviews literature on food security, integrated coastal fisheries governance programme, and coping mechanisms. Chapter Three defines the population, research design, sampling procedure and sample size, and data collection as well as the statistical tools for analysing the data. Presentation and discussion of results are captured in Chapter Four. Chapter Five summarizes, concludes the study and highlights some recommendations for the study and some suggested areas for further studies.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter review literature that is important for this study. It focus on Evaluation, Programme Evaluation, food (in) security concepts, pillars and measurements; integrated coastal fisheries governance programme; coping mechanisms employed during periods of food shortage and empirical research on food security

Evaluation

Evaluation is a systematic investigation of a subject's merits, worth and importance, using criteria governed by a set of standards. It is the structured interpretation and giving of meaning to predict or actual impacts of proposals or results. When done well, it possess the potential of a great tool for an organization, programme, project or any other intervention or initiative to assess any aim, realisable concept/proposal, or any alternative, to help in decision-making. It can also help ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed (Staff, 2012).

It looks at original objectives, which are either predicted, or what was accomplished and how it was accomplished. The primary purpose of evaluation, in addition to gaining insight into prior or existing initiatives, is to enable reflection and assist in the identification of future change (Tufo, 2002). Evaluation can be formative that is, taking place during the development of a concept or proposal, project or organization, with the intention of improving the

value or effectiveness of the proposal, project, or organisation. It can also be assumptive, drawing lessons from a completed action or project or an organisation at a later point in time or circumstance. Evaluation is often used to characterise and appraise subjects of interest in a wide range of human enterprises, including the arts, criminal justice, foundations, non-profit organization, government, health care, and other human services.

Evaluation is inherently a theoretically informed approach (whether explicitly or not), and consequently any particular definition of evaluation would have be tailored to its context – the theory, needs, purpose, and methodology of the evaluation process itself. Having said this, evaluation has been defined as:

Rossi, Ellipse and Freeman (2004) say that evaluation is a systematic, rigorous, and meticulous application of scientific methods to assess the design, implementation, improvement, or outcomes of a programme. It is a resource-intensive process, frequently requiring resources, such as, evaluates expertise, labour, time, and a sizable budget.

"The critical assessment, in an objective a manner as possible, of the degree to which a service or its component parts fulfils stated goals (Reeve & Paperboy, 2007) The focus of this definition is on attaining objective knowledge, and scientifically or quantitatively measuring predetermined and external concepts. A study designed to assist some audience to assess an object's merit and worth. In this definition the focus is on facts as well as value laden judgments of the programmes outcomes and worth.

Programme Evaluation

Programme evaluation is a systematic method for collecting, analyzing, and using information to answer questions about projects, policies and programmes

particularly about their effectiveness and efficiency. In both the public and private sectors, stakeholders often want to know whether the programmes they are funding, implementing, voting for, receiving or objecting to are producing the intended effect. While programme evaluation first focuses around this definition, important considerations often include how much the programme costs per participant, how the programme could be improved, whether the programme is worthwhile, whether there are better alternatives, if there are unintended outcomes, and whether the programme goals are appropriate and useful. Evaluators help to answer these questions, but the best way to answer the questions is for the evaluation to be a joint project between evaluators and stakeholders.

The process of evaluation is considered to be a relatively recent phenomenon. However, planned social evaluation has been documented as dating as far back as 2200 BC (Shadish, Cook, & Leviton, 1991). Programme evaluations can involve both quantitative and qualitative methods of social research. People who do programme evaluation come from many different backgrounds, such as sociology, psychology, economics, social work, and public policy. Some graduate schools also have specific training programmes for programme evaluation.

Purpose of Evaluation

According to Marthe, Sylvain, and Stephanie (2009), the main purpose of a programme evaluation can be to "determine the quality of a programme by formulating a judgment". An alternative view is that "projects, evaluators, and other stakeholders (including funders) will all have potentially different ideas

about how best to evaluate a project since each may have a different definition of 'merit'. The core of the problem is thus about defining what is of value." From this perspective, evaluation "is a contested term", as "evaluators" use the term evaluation to describe an assessment, or investigation of a programme.

There are two function considering the evaluation purpose; Formative Evaluations and Summative Evaluations. Formative Evaluations provide the information the improvement a product or a process whiles Summative Evaluations provide information of short-term effectiveness or long-term impact to deciding the adoption of a product or process (Staff, 2011). Not all evaluations serve the same purpose. Some evaluations serve a monitoring function rather than focusing solely on measurable programme outcomes or evaluation findings and a full list of types of evaluations would be difficult to compile. This is because evaluation is not part of a unified theoretical framework, drawing on a number of disciplines, which include management and organisational theory, policy analysis, education, sociology, social anthropology, and social change (Alkin & Ellett ,1990)

Types of Evaluation

There are many different types of evaluations depending on the object being evaluated and the purpose of the evaluation. Perhaps the most important basic distinction in evaluation types is that between *formative* and *summative* evaluation. Formative evaluations strengthen or improve the object being evaluated -- they help form it by examining the delivery of the programme or technology, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, inputs, and so on. Summative

evaluations, in contrast, examine the effects or outcomes of some object -- they summarize it by describing what happens subsequent to delivery of the programme or technology; assessing whether the object can be said to have caused the outcome; determining the overall impact of the causal factor beyond only the immediate target outcomes; and, estimating the relative costs associated with the object.

Formative evaluation include evaluation like needs assessment. Need assessment determines who needs the programme, how great the need is, and what might work to meet the need evaluability assessment determines whether an evaluation is feasible and how stakeholders can help shape its usefulness structured conceptualization helps stakeholders define the programme or technology, the target population, and the possible outcomes implementation evaluation monitors the fidelity of the programme or technology delivery process evaluation investigates the process of delivering the programme or technology, including alternative delivery procedures.

Summative evaluation can also be subdivided:

Outcome evaluations investigate whether the programme or technology caused demonstrable effects on specifically defined target outcomes.

Impact evaluation is broader and assesses the overall or net effects -- intended or unintended -- of the programme or technology as a whole.

Cost-effectiveness and cost-benefit analysis address questions of efficiency by standardizing outcomes in terms of their dollar costs and values.

Secondary analysis re-examines existing data to address new questions or use methods not previously employed.

Meta-analysis integrates the outcome estimates from multiple studies to arrive at an overall or summary judgement on an evaluation question.

Doing an Evaluation

Programme evaluation may be conducted at several stages during a programme's lifetime. Each of these stages raises different questions to be answered by the evaluator, and correspondingly different evaluation approaches are needed. Rossi, Ellipse and Freeman (2004) suggest the following kinds of assessment, which may be appropriate at these different stages:

- Assessment of the need for the programme
- Assessment of programme design and logic/theory
- Assessment of how the programme is being implemented (i.e., is it being implemented according to plan? Are the programme's processes maximizing possible outcomes?)
- Assessment of the programme's outcome or impact (i.e., what it has actually achieved)
- Assessment of the programme's cost and efficiency

Assessing Needs

A needs assessment examines the population that the programme intends to target, to see whether the need as conceptualized in the programme actually exists in the population; whether it is, in fact, a problem; and if so, how it might best be dealt with. This includes identifying and diagnosing the actual problem the programme is trying to address, who or what is affected by the problem, how widespread the problem is, and what are the measurable effects that are caused by

the problem. For example, for a housing programme aimed at mitigating homelessness, a programme evaluator may want to find out how many people are homeless in a given geographic area and what their demographics are. Rossi et al., (2004) caution against undertaking an intervention without properly assessing the need for one, because this might result in a great deal of wasted funds if the need did not exist or was misconceived.

Needs assessment involves the processes or methods used by evaluators to describe and diagnose social needs. This is essential for evaluators because they need to identify whether programmes are effective and they cannot do this unless they have identified what the problem/need is. Programmes that do not do a need assessment can have the illusion that they have eradicated the problem/need when in fact there was no need in the first place. Needs assessment involves research and regular consultation with community stakeholders and with the people that will benefit from the project before the programme can be developed and implemented. Hence it should be a bottom-up approach. In this way potential problems can be realised early because the process would have involved the community in identifying the need and thereby allowed the opportunity to identify potential barriers. The important task of a programme evaluator is thus to: First, construct a precise definition of what the problem is. Evaluators need to first identify the problem/need. This is most effectively done by collaboratively including all possible stakeholders, i.e., the community impacted by the potential problem, the agents/actors working to address and resolve the problem, funders, etc. Including buy-in early on in the process reduces potential for push-back, miscommunication, and incomplete information later on. Second, assess the extent of the problem.

Having clearly identified what the problem is, evaluators need to then assess the extent of the problem. They need to answer the 'where' and 'how big' questions. Evaluators need to work out where the problem is located and how big it is. Pointing out that a problem exists is much easier than having to specify where it is located and how rife it is. Rossi, et al., (2004) gave an example that: a person identifying some battered children may be enough evidence to persuade one that child abuse exists. But indicating how many children it affects and where it is located geographically and socially would require knowledge about abused children, the characteristics of perpetrators and the impact of the problem throughout the political authority in question.

This can be difficult considering that child abuse is not a public behaviour, also keeping in mind that estimates of the rates on private behaviour are usually not possible because of factors like unreported cases. In this case evaluators would have to use data from several sources and apply different approaches in order to estimate incidence rates. There are two more questions that need to be answered; Evaluators need to also answer the 'how' and 'what' questions (Barbazette, 2006). The 'how' question requires that evaluators determine how the need will be addressed. Having identified the need and having familiarised oneself with the community evaluators should conduct a performance analysis to identify whether the proposed plan in the programme will actually be able to eliminate the need. Third, define and identify the target of interventions and accurately describe the nature of the service needs of that population. It is important to know what/who the target population is/are – it might be individuals, groups, communities, etc. There are three units of the population: population at risk, population in need and population in demand.

- Population at risk: are people with a significant probability of developing the risk e.g. the population at risk for birth control programmes are women of child bearing age.
- Population in need: are people with the condition that the programme seeks to address; e.g. the population in need for a programme that aims to provide ARV's to HIV positive people are people that are HIV positive.
- Population in demand: that part of the population in need that agrees to be having the need and are willing to take part in what the programme has to offer e.g. not all HIV positive people will be willing to take ARV's.

Being able to specify what/who the target is will assist in establishing appropriate boundaries, so that interventions can correctly address the target population and be feasible to apply. According to Rouda and Kusy (1995), there are four steps in conducting a needs assessment:

1. Perform a 'gap' analyses

Evaluators need to compare current situation to the desired or necessary situation. The difference or the gap between the two situations will help identify the need, purpose and aims of the programme.

2. Identify priorities and importance

In the first step above, evaluators would have identified a number of interventions that could potentially address the need e.g. training and development, organization development etc. These must now be examined in view of their significance to the programme's goals and constraints. This must be done by considering the following factors: cost effectiveness (consider the budget of the programme, assess cost/benefit ratio), executive pressure (whether top

management expects a solution) and population (whether many key people are involved).

3. Identify causes of performance problems and/or opportunities

   When the needs have been prioritised the next step is to identify specific problem areas within the need to be addressed. And to also assess the skills of the people that will be carrying out the interventions.

4. Identify possible solutions and growth opportunities

   Compare the consequences of the interventions if it was to be implemented or not. Needs analysis is hence a very crucial step in evaluating programmes because the effectiveness of a programme cannot be assessed unless we know what the problem was in the first place.

Assessing Implementation

Process analysis looks beyond the theory of what the programme is supposed to do and instead evaluates how the programme is being implemented. This evaluation determines whether the components identified as critical to the success of the programme are being implemented. The evaluation determines whether target populations are being reached, people are receiving the intended services, and staff are adequately qualified. Process evaluation is an ongoing process in which repeated measures may be used to evaluate whether the programme is being implemented effectively. This problem is particularly critical because many innovations, particularly in areas like education and public policy, consist of fairly complex chains of action. Many of which these elements rely on the prior correct implementation of other elements, and will fail if the prior implementation was not done correctly. This was conclusively demonstrated

by Gene V. Glass and many others during the 1980s. Since incorrect or ineffective implementation will produce the same kind of neutral or negative results that would be produced by correct implementation of a poor innovation, it is essential that evaluation research assess the implementation process itself (Eveland, 1986) Otherwise, a good innovative idea may be mistakenly characterised as ineffective, where in fact it simply had never been implemented as designed.

Assessing the Impact

The impact evaluation determines the causal effects of the programme. This involves trying to measure if the programme has achieved its intended outcomes, i.e. programme outcomes

Programme Outcomes

An outcome is the state of the target population or the social conditions that a programme is expected to have changed. Programme outcomes are the observed characteristics of the target population or social conditions, not of the programme. Thus the concept of an outcome does not necessarily mean that the programme targets have actually changed or that the programme has caused them to change in any way. There are two kinds of outcomes, namely outcome level and outcome change, also associated with programme effect.

- Outcome level refers to the status of an outcome at some point in time.
- Outcome change refers to the difference between outcome levels at different points in time.

- Programme effect refers to that portion of an outcome change that can be attributed uniquely to a programme as opposed to the influence of some other factor.

Measuring Programme Outcomes

Outcome measurement is a matter of representing the circumstances defined as the outcome by means of observable indicators that vary systematically with changes or differences in those circumstances. Outcome measurement is a systematic way to assess the extent to which a programme has achieved its intended outcomes. According to Mouton (2009) measuring the impact of a programme means demonstrating or estimating the accumulated differentiated proximate and emergent effect, some of which might be unintended and therefore unforeseen. Outcome measurement serves to help you understand whether the programme is effective or not. It further helps you to clarify your understanding of your programme. But the most important reason for undertaking the effort is to understand the impacts of your work on the people you serve (Mouton, 2009). With the information you collect, you can determine which activities to continue and build upon, and which you need to change in order to improve the effectiveness of the programme.

This can involve using sophisticated statistical techniques in order to measure the effect of the programme and to find causal relationship between the programme and the various outcomes. More information about impact evaluation is found under the heading 'Determining Causation'.

Assessing Efficiency

Finally, cost-benefit or cost-effectiveness analysis assesses the efficiency of a programme. Evaluators outline the benefits and cost of the programme for comparison. An efficient programme has a lower cost-benefit ratio.

Determining Causation

Perhaps the most difficult part of evaluation is determining whether the programme itself is causing the changes that are observed in the population it was aimed at. Events or processes outside of the programme may be the real cause of the observed outcome (or the real prevention of the anticipated outcome). Causation is difficult to determine. According to Delbert, Neil and Salkind (2002), one main reason for this is self-selection bias. People select themselves to participate in a programme. For example, in a job training programme, some people decide to participate and others do not. Those who do participate may differ from those who do not in important ways. They may be more determined to find a job or have better support resources. These characteristics may actually be causing the observed outcome of increased employment, not the job training programme.

Evaluations conducted with random assignment are able to make stronger inferences about causation. Randomly assigning people to participate or to not participate in the programme reduces or eliminates self-selection bias. Thus, the group of people who participate would likely be more comparable to the group who did not participate. However, since most programmes cannot use random assignment, causation cannot be determined. Impact analysis can still provide useful information. For example, the outcomes of the programme can be

described. Thus the evaluation can describe that people who participated in the programme were more likely to experience a given outcome than people who did not participate. If the programme is fairly large, and there are enough data, statistical analysis can be used to make a reasonable case for the programme by showing, for example, that other causes are unlikely.

Types of evaluation

An important question when the Evaluation Plan is being developed is what type of evaluation the programme would like to perform. Evaluation can be of a more strategic character, thematic, cross-programme or operational. An evaluation could also be a combination of these. Several possibilities are mentioned here:

Strategic evaluation: A strategic evaluation generally focuses on the longer term and includes the broader policy context to decide on current or future strategic decisions. An example would be to see how the programme is contributing to the (revised) Lisbon Agenda. A strategic evaluation generally investigates the programme's relevance and also its effectiveness.

Thematic evaluation: A thematic evaluation focuses on a specific theme, such as innovation or equal opportunities. Thematic evaluations mostly look at the effectiveness and relevance of the programme.

Cross-programme evaluation: A cross-programme evaluation focuses on several programmes, e.g. all transnational programmes, or all territorial programmes in the Danube area, or several programmes who would all like to evaluate e.g. monitoring procedures. A cross-programme evaluation can be

focussed on one or more of the key evaluation issues: relevance, effectiveness and efficiency.

Operational evaluation: An operational evaluation deals with operational issues such as application procedures or performance of the programme. In an operational evaluation the efficiency and effectiveness of the programme will be the central focus. These types of evaluation are often performed in combination. For example:

- A *thematic cross-programme* evaluation could focus on innovation in several programmes;
- An *operational cross-programme* evaluation would look at operational aspects of several programmes, such as the performance of the indicators in several programmes.

Empirical Evaluation

Several empirical evaluations have been conducted in various institutions by different persons and in many different fields. Gordon (1972) performed an evaluation of nutritional education given to pregnant and nursing women in six communities in the Upper region of Ghana. His evaluation concluded that mothers 'exposed to nutritional education showed an improvement in knowledge. However, the study also found that the women were not putting this knowledge into practice resulting in no significant difference in children's growth or infant mortality. Another evaluation in the same line as Gordon (1972) is Gueri, Jutsum, and White (1978) work on breastfeeding. Gueri et al. (1978) evaluated a breastfeeding campaign in Trinidad. Prissie (2008) also did an evaluation in the

area of medicine with an objective of evaluating the processes and outcomes of the IPTp programme using SP for malaria control in pregnancy.

Empirical evaluations also focus on evaluating programme like food security or food aid programmes such as Gilmore (1980). His work focused on food aid and nutritional education in Morocco in 1975. Davis (2013) performed an evaluation of Zoomlion Ghana's participation in solid waste management in Ablekuma central sub-metropolitan area. Tineke (2007) worked on evaluating the impact of the Ghana School Feeding Programme. His research study area was the central region of Ghana. He concluded that Ghana meets their own formulated recommendations for energy and protein content of the school meals. His findings also suggest that vitamin A content is probably sufficient, but iron intake remains low. His study also found that impart of the SFP on local demand for staple foods at district level seems limited and hence more research is needed to determine whether Ghana's SFP is capable of increasing the demand for locally produced food.

Zakaria (2011) performed an evaluation of a programme undertaken in public administration. He performed an evaluation of NGO-Led Development Interventions and their Sustainable Management in the Savelugu-Nantong District. He concluded that the increasing role of NGOs in development and the increasing attention they attract from donors makes them indispensable in the current economic atmosphere in Ghana and the study area in particular.

Antwi-Boadi (2002) research focuses on Evaluation of the Final Senior Secondary School Visual Art Project/Practical work, with emphasis in Ashanti Region. The research found that the visual art department had trained art teachers

and facilities for teaching. He also found that most of the materials used were found locally and only a few were imported.

Amanfo (2011) work also concerned in the teaching filled. His work was on the out-programme one year teaching practice of final year students with St. Joseph's college of education in Bechem as the study area. His major finding was that the formulation of written objective, the development of plans or policies, and the evaluation of the student teaching programme were generally a cooperative endeavour involving teacher education institution personnel, cooperating school system personnel, and student teachers.

The areas of finance and banking have not been forgotten in empirical evaluation works. Afram's (2011) work is a testament to that. He evaluated the competitive strategies in the Banking industry in Ghana using Barclays Bank as a case study. His findings conclude that BBG operates in a highly competitive environment with 70.7% of the respondents strongly agreeing that the competition in the banking industry is keen.

Problem with evaluations

As good as evaluations are, there are some problems that need to be addressed in other to carry them out effectively. One of such problem is selection bias. Selection bias arises when respondents in a program are systematically different from non-participants (even before they enter the program). Normally participants to non-participants are compared to each other to draw inferences about the effect of the program; selection bias affects the authenticity of the research, which may sway or skew evaluations in the positive direction. A good example of this is the work done by Glazer, Levy, and Myers (2003).

Peikes, Moreno, and Orzol (2008) evaluated the impact of the US State Partnership Initiative employment promotion program, using two methods: (a) a randomized controlled trial, with very low vulnerability to selection bias (see discussion above regarding randomization); (b) propensity-score matching, a relatively popular method for attempting to simulate a comparison between program participants and identical non-participants without the benefit of randomization (using available observable characteristics of participants and non-participants). Despite "seemingly ideal circumstances" for method (b), the two methods produced meaningfully different results: in two of the three locations, method (b) implied large, positive, statistically significant impacts of the program on earnings, while method (a) implied negative, non-statistically significant impacts of the program on earnings.

Another problem that affects evaluations is publication bias. Publication bias is a broad term for factors that systematically bias final, published results in the direction that the researchers and publishers (consciously or unconsciously) wish them to point.

Interpreting and presenting data usually involves a substantial degree of judgment on the part of the researcher; consciously or unconsciously, a researcher may present data in the most favourable light for his/her point of view. In addition, studies whose final conclusions aren't what the researcher (or the study funder) hoped for may be less likely to be made public.

Hopewell (2009) reviewed five studies examining patterns in which clinical trials did and didn't have their results published in medical literature. These studies showed that trials with positive findings or those findings perceived to be important or striking, or those indicating a positive direction of treatment

effect), had nearly four times the odds of being published compared to findings that were not statistically significant or perceived as unimportant, or showing a negative or null direction of treatment effect. De Long and Lang (1992) give some evidence for a broad form of publication bias in the field of economics

Food security

USAID defines food security as when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. Achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that households have adequate access to those food supplies through their own production, through the market or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals.

IICA defined food (in)security as the existence of the necessary conditions for human beings to have physical and economic access, *in socially acceptable ways,* to food that is safe, nutritious and in keeping with their cultural preferences, so as to meet their dietary needs and live productive and healthy lives. According to EC-FAO, Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. (World Food Summit, 1996)

A running theme in all this definition is ‘All people having physical and economic access to food that meets their dietary requirements. Rychetnick et al. (2003) said Food insecurity has many components that are influenced by both the food system and individual, social and economic factors. Factors that may affect

food insecurity at an individual level include nutrition knowledge, cooking skills, availability of cooking equipment and time and ability to prepare food. These in turn are influenced by social and economic factors of the individual, family or community (Queensland health, 2006).

Dimensions or Pillars of food security

The WHO states that there are three pillars that determine food security: food availability, food access, and food use. The FAO adds a fourth pillar: the stability of the first three dimensions of food security over time. In 2009, the World Summit on Food security stated that the "four pillars of food security are availability, access, utilization, and stability"

Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid). (World food summit, 1996). According to Gregory et al. (2005), food availability relates to the supply of food through production, distribution, and exchange. Global food consumers outnumber producers in every nation of the world (Ecker and Breisinger, 2012), it is important that food be distributed to different regions or nations. Crop production is not required for a country to achieve food security. Nations don't have to have the natural resources required or engage in crops production in order to achieve food security. A prime example is seen in the examples Singapore (Ecker & Breisinger, 2012). Around the world, few individuals or households are continuously self-reliant for food. This creates the need for a bartering, exchange, or cash economy to acquire food (Gregory et al., 2005).The exchange of food requires efficient trading system and market

institutions, which can have an impact on food (in)security (Ecker & Breisinger, 2012).

Food access: Food access refers to being able to afford and allocate food, as well as the preferences of individuals and households as a whole. Food access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet (Gregory et al., 2005). Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources). The UN Committee on Economic, Social, and Cultural Rights noted that the causes of hunger and malnutrition are often not a scarcity of food but an inability to access available food, usually due to poverty. This strengthen the claim that access is a stronger cause of food security than availability

Utilization: The final pillar of food (in) security is food utilization, which refers to the metabolism of food by individuals (Tweeten 1999). Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food (in) security.

Food safety affects food utilization, and can be affected by the preparation, processing, and cooking of food in the community and household. Nutritional values of the household determine food choice, and whether food meets cultural preferences is important to utilization in terms of psychological and social well-being (Loring, 2009)

Stability: Food stability refers to the ability to obtain food over time. To be food secure, a population, household or individual must have access to adequate food

at all times. Food (in) security can be transitory, seasonal, or chronic (FAO, 1997). They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security. According to Ecker and Breisinger (2012) in transitory food insecurity occurs when food is unavailable during certain periods of time. Circumstances like natural disasters and drought and heavy rainfall may occur at the food production resulting in crop failure and decreased food availability. Civil conflicts can also decrease access to food. Instability in markets resulting in food-price spikes can cause transitory food insecurity. Other factors that can temporarily cause food insecurity are loss of employment or productivity, which can be caused by illness. Seasonal food insecurity can result from the regular pattern of growing seasons in food production.

The State of Food (in) security in the World

About 850 million people in the world are undernourished - a number that has hardly changed since the 1990-92 base period for the World Food Summit and Millennium Development Goal commitments on reducing hunger by half by 2015. Of particular concern are hunger hotspots, marked by the widespread persistence and prevalence of food insecurity, especially in protracted crises. As of May 2006, 39 countries in the world were experiencing serious food emergencies and required external assistance for dealing with critical food insecurity: 25 in Africa, 11 in Asia and Near East, 2 in Latin America and 1 in Europe. The table below clearly indicates the importance of human agency in inducing crises, either directly (through wars and civil strife) or through

interaction with natural hazards that would otherwise have been of minor importance.

Table 1

Food Emergencies, 2005

Dominant variable	Africa	Asia	Latin America	Europe	Total
Human	10	3	2	2	15
Natural	8	7	1	0	16
Combined	7	1	0	0	8
Total	25	11	2	1	39

Source: FAO GIEWS, 2005

About one in every nine people in the world still has insufficient food for an active and healthy life. The vast majority of these undernourished people live in developing countries, where an estimated 791 million were chronically hungry in 2012–14. Although developing countries also account for most of the improvements over the last two decades – with an overall reduction of 203 million undernourished people since 1990–92 – about one in eight people in these regions, or 13.5 percent of the overall population, remain chronically underfed. Considerable efforts are therefore still needed to reach the Millennium Development Goal (MDG) hunger target by 2015, especially in countries that have registered inadequate progress.

Table 2

UNDERNOURISHED AROUND THE WORLD, 1990-92 TO 2012-14
Number of undernourished (millions) and prevalence (%) of undernourished

	1990-92		2000-02		2005-07		2008-10		2012-2014	
	No	%	No	%	No	%	No	%	No	%
WORLD	**1 014.5**	**18.7**	**929.9**	**14.9**	**946.2**	**14.3**	**840.5**	**12.1**	**805.3**	**11.3**
DEVELOPED REGIONS	20.4	<5	21.1	<5	15.4	<5	15.7	<5	14.6	<5
DEVELOPING REGIONS	994.1	23.4	908.7	18.2	930.8	17.3	824.9	14.5	790.7	13.5
Africa	**182.1**	**27.7**	**209.0**	**25.2**	**211.8**	**22.6**	**216.8**	**20.9**	**226.7**	**20.5**
Northern Africa	6.0	<5	6.5	<5	6.4	<5	5.6	<5	12.6	6.0
Sub-Saharan Africa	176.0	33.3	202.5	29.8	205.3	26.5	211.2	24.4	214.1	23.8
Asia	**742.6**	**23.7**	**637.5**	**17.6**	**668.6**	**17.4**	**565.3**	**14.1**	**525.6**	**12.7**
Caucasus and Central Asia	9.6	14.1	10.9	15.3	8.5	11.3	7.4	9.5	6.0	7.4
Eastern Asia	295.2	23.2	222.2	16.0	218.4	15.3	185.8	12.7	161.2	10.8
South-Eastern Asia	138.0	30.7	117.7	22.3	103.3	18.3	79.3	13.4	63.5	10.3
Southern Asia	291.7	24.0	272.9	18.5	321.4	20.2	274.5	16.3	276.4	15.8
Western Asia	8.0	6.3	13.8	8.6	17.0	9.3	18.3	9.1	18.5	8.7
Latin America & Caribbean	**68.5**	**15.3**	**61.0**	**11.5**	**49.2**	**8.7**	**41.5**	**7.0**	**37.0**	**6.1**
Caribbean	8.1	27.0	8.2	24.4	8.4	23.7	7.6	20.7	7.5	20.1
Latin America	60.3	14.4	52.7	10.7	40.8	7.7	33.9	6.1	29.5	5.1
Oceania	**1.0**	**15.7**	**1.3**	**16.5**	**1.3**	**15.4**	**1.3**	**13.5**	**1.4**	**14.0**

Source: FAO GIEWS, 2005

The decline in the number of hungry people has been more impressive than the reduction in absolute numbers. Between 1990–92 and 2012–14, the prevalence of undernourishment has fallen from 18.7 percent to 11.3 percent at the global level and from 23.4 percent to 13.5 percent in developing countries (FAO GIEWS, 2005). This means that the MDG 1c hunger target of halving the proportion of undernourished people by 2015 is within reach. If the current trend of a reduction of about 0.5 percent per year since 1990–92 continues, the prevalence of undernourishment in developing regions would reach 12.8 percent in 2015 – 1.1 percentage points above the MDG target of 11.7 percent. With greater efforts, particularly in sub-Saharan Africa and Southern and Western Asia, the trend in hunger reduction can be accelerated to meet the MDG hunger target. While the MDG hunger target seems to be within reach globally, there is not enough time to achieve the World Food Summit (WFS) target of halving the number of undernourished people by 2015.

Despite the progress in developing regions as a whole, large differences remain across regions. In general, in Africa, there has been insufficient progress towards international hunger targets, especially in the sub-Saharan region, where more than one in four people remain undernourished – the highest prevalence of any region in the world. Nevertheless, the prevalence of undernourishment in sub-Saharan Africa has declined from 33.3 percent in 1990–92 to 23.8 percent in 2012–14. Growing political commitment to promote food security in Africa is being transformed into concrete results. Strong economic growth (7 of the 10 fast-growing economies in the world are in Africa) is improving the living conditions of its growing population. There is greater recognition of the importance of ensuring peace and stability, the lack of which has been both cause

and consequence of conflict that risks thwarting efforts to fight hunger in many countries in Africa. The situation is different in Northern Africa, which has a far lower hunger burden, with the prevalence of undernourishment consistently less than 5 percent since 1990.

Asia as a whole has a prevalence of undernourishment of 12.7 percent, corresponding to 526 million people, or an eighth of the region's population, chronically lacking access to enough food. As the most populous region in the world, Asia is home to two out of three of the world's undernourished people. Overall, it is close to reaching the MDG 1c hunger target, but there are large differences across its sub regions. Eastern and South-Eastern Asia have already met the target, having cut their under nutrition rates by more than half and more than two-thirds respectively. The Caucasus and Central Asia are also on track to reach the goal by 2015, while lack of progress in Southern and Western Asia makes it unlikely that these regions can achieve MDG 1c. Hunger continues to take its largest toll in Southern Asia, where population growth is high. The estimate of 276 million chronically undernourished people in 2012–14 is only marginally lower than the number at the beginning of the MDG process. Although the prevalence of undernourishment has declined from 24.0 percent in 1990–92 to 15.8 percent in 2012–14, progress is still too slow to allow Southern Asia to reach the MDG target by 2015. The situation is worse in Western Asia, where the prevalence of undernourishment actually increased from 6.3 percent in 1990–92 to 8.7 percent in 2012–14, largely owing to political instability and the deterioration in overall economic conditions during recent years.

To date, Latin America and the Caribbean – the first region to publically commit to eradicate hunger by 2025 – has the most successful developing region record in increasing food security. It has already met the MDG target by a comfortable margin and is close to the WFS summit target. Much of the success results from rapid hunger reduction in Latin America, which has reached the WFS target, while the Caribbean has seen slower progress in fighting undernourishment so far. For the region as a whole, the prevalence of undernourishment has declined to 6.1 percent – representing little more than one-third of its hunger burden in the early 1990s. Of all the developing regions, Oceania currently has the lowest number of undernourished people. However, despite the low overall burden of hunger in the region, this number has increased over the last two decades, while the prevalence of undernourishment has only registered a very modest reduction: estimates place undernourishment at 14.0 percent in 2012–14, only 1.7 percentage points below the level for 1990–92. An additional cause for concern is that rising undernourishment in Oceania has been accompanied by a growing burden of overweight and obesity, exposing the region to a significant double burden of malnutrition.

Food (in) security In Ghana

Statistics at the world food programme indicate that about 1.2 million people, representing 5 % of Ghana's population, are food insecure. Thirty four percent (34%) of the population are in Upper West region, followed by Upper East with 15 percent and Northern region with 10 percent, amounting to approximately 453,000 people. Throughout the country, about 2 million people are vulnerable to become food insecure. Their food consumption patterns were

barely acceptable at the time of the survey and can quickly deteriorate following a natural or man-made shock. About 507,000 (40%) people are vulnerable of becoming food insecure in the rural areas of Upper West, Upper East and Northern regions. Up to 1.5 million people vulnerable to food insecurity live in the rural and urban areas of the remaining seven regions, with the largest share of them in Brong-Ahafo (11%), in Ashanti (10%), followed by Eastern Region.

Effects of food insecurity

Food security, on the one hand, and famine and hunger on the other, are inversely related concepts. Ensuring food security is equated to avoidance of famine and hunger. Famine and hunger result from the lack of food security. Famine is an absolute lack of food affecting a large population for a long time period. Famine is a disaster of food insecurity. Klinterberg (1977) described famine as "an event which disrupts the functioning of a community to such an extent that it cannot subsist without outside assistance." According to Wolde-Mariam (1984), famine is a "general hunger affecting large numbers of people as a consequence of non-availability of food for a relatively longer time." Wolde-Mariam described it as a human tragedy: "a husband has eaten his wife, a mother has eaten her babies ... and free men have turned themselves into slaves. This is famine." This tragedy can be avoided.

The one "good" thing about famine is that it does not strike unexpectedly, but builds up slowly and provides a lead time before it occurs. In other words, the predictability of famine makes it possible to prevent it. If a food shortage develops to the scale of a famine, it must therefore be the weakness of society in general and government in particular. In this sense, famine is a man-made disaster

(Ayalew, 1988). Hunger is not famine. It is similar to undernourishment and is related to poverty. Mainly in poor countries, there are always undernourished and hungry people. In many poor countries there is seasonal hunger, usually in the months just before the coming harvest. People become weakened as a result of not having had adequate food for days. When hunger persists for a longer period, covering a large number of the population and resulting in mass migration and death, it then becomes famine.

Types of food insecurity

Famine and hunger are both rooted in food insecurity. Food insecurity can be categorised as either chronic or transitory. Chronic food insecurity translates into a high degree of vulnerability to famine and hunger; ensuring food security presupposes elimination of that vulnerability. Vulnerable populations can reach the stage of famine with slight abnormalities in the food production-distribution-consumption process. Therefore, in conditions of chronic food insecurity there is always an impending famine.

Transitory food insecurity is a temporary or seasonal shortage of food because of unexpected factors for only a limited period. In a chronically food-insecure society or in situations of chronic hunger, it may lead to famine, whereas in normally food-secure populations, it does not turn into famine because of the resilience of the population. Repeated seasonal food insecurity, however, could deplete the assets of the even seemingly secure societies, exposing them to a higher level of famine vulnerability. If this is the relationship between famine and food insecurity, is there any

relationship between food (in)security systems and famine early warning systems (FEWS)

Food Security Measurements

According to Webb (2006) and Perez-Escamilla (2008) food security indicators and measures are derived from country level household income and expenditure surveys to estimate per capita caloric availability. In general the objective of food security indicators and measures is to capture some or all of the main components of food security in terms of food availability, access and utilization or adequacy. While availability (production and supply) and utilization/adequacy (nutritional status/anthropometric measures) seemed much easier to estimate, thus more popular, access (ability to acquire sufficient quantity and quality) remain largely elusive (Barrett, 2010). The factors influencing household food access are often context specific. Thus the financial and technical demands of collecting and analysing data on all aspects of household's experience of food access and the development of valid and clear measures remain a huge challenge. Nevertheless several measures have been developed that aim to capture the access component of food (in)security, with some notable examples developed by the USAID-funded Food and Nutrition Technical Assistance (FANTA) project, collaborating with Cornell and Tufts University and Africare and World Vision. (Swindale, 2006)

These include:

- *Household Food Insecurity Access Scale* (HFIAS) - continuous measure of the degree of food insecurity (access) in the household in the previous month

- *Household Dietary Diversity Scale* (HDDS) - measures the number of different food groups consumed over a specific reference period (24hrs/48hrs/7days).
- *Household Hunger Scale* (HHS)- measures the experience of household food deprivation based on a set of predictable reactions, captured through a survey and summarized in a scale.

Food Security Scales

The set of food security questions included in the core survey module can be combined into a single overall measure called the food security scale. This is a continuous, linear scale which measures? The statistical procedure that determines a household's scale value is rather complicated, but fundamentally it depends on the *number* of increasingly severe indications of food insecurity that the household has experienced, as indicated by affirmative responses to the increasingly severe *sequence* of survey questions. A household with a scale value of 6, for example, has responded affirmatively to *more*, and typically to *more severe*, indicators of food insecurity than a household with a scale value of 3. A household that has not experienced any of the conditions of food insecurity covered by the core module questions will be assigned a scale value of 0, while a household that has experienced all of them will have a scale value close to 10.

How Is the Household's Food (in) security Status Determined

It is often useful, both for policy and research purposes, to simplify the food (in)security scale into a small set of categories, each one representing a meaningful *range of severity* on the underlying scale, and to discuss the

percentage of the population in each of these categories. Four categories have been defined for this purpose:

Food secure — Households show no or minimal evidence of food insecurity.

Food insecure without hunger — Food insecurity is evident in household members' concerns about adequacy of the household food supply and in adjustments to household food management, including reduced quality of food and increased unusual coping patterns. Little or no reduction in members' food intake is reported.

Food insecure with hunger (moderate) — Food intake for adults in the household has been reduced to an extent that implies that adults have repeatedly experienced the physical sensation of hunger. In most (but not all) food-insecure households with children, such reductions are not observed at this stage for children.

Food insecure with hunger (severe) — At this level, all households with children have reduced the children's food intake to an extent indicating that the children have experienced hunger. For some other households with children, this already has occurred at an earlier stage of severity. Adults in households with and without children have repeatedly experienced more extensive reductions in food intake.

Sometimes it is preferable to combine the third and fourth groups into a single broader category and to use the term ***food insecure with hunger*** for the combined categories. A household is classified into one of the food (in) security status-level categories on the basis of its score on the food (in)security scale, while the household's scale score is determined by its overall pattern of response to the set of indicator questions. Households with very low scale scores are those that report no, or very limited, food-insecurity or hunger experiences. These

households are classified as food secure. At the other extreme, households with very high scale scores are those that have reported a large number of the conditions and are classified as food insecure with hunger.

How Does the Household Measure Relate to the Food security of Individual Household Members?

The food security scale represents the condition of *household members as a group*, and not necessarily the condition of any particular household member. In general, conditions of food insecurity are believed to affect all household members, although not necessarily in the same way. By contrast, hunger is a uniquely individual phenomenon--some members of the household may be hungry while others are not. Consequently, when the scale measure classifies a household into the more severe range, food insecure with hunger, what it tells us is that at least some member, or members, of the household are experiencing hunger due to insufficiency of household resources, but not necessarily all members. The resultant prevalence figures for the estimated number and percent of households that are food insecure with hunger thus need to be interpreted carefully. These are households with evidence to indicate that some member(s) has\have been hungry due to lack of resources at least sometime during the prior 12 months, but not necessarily all members and not necessarily in all, or even most, months.

Similarly, the estimated numbers of all persons--adults and children--in households that are food insecure with hunger need to be interpreted carefully. Not all such individuals necessarily have experienced hunger within the survey period, based on strict interpretation of what the data tell us. For adults in such

households this distinction may not be very important. That is, when the household is impacted by food insecurity due to inadequate resources for food, at the level of seriousness such that any adult members are experiencing hunger, preliminary evidence suggests that most, if not all, adults in the household are likely to be similarly hungry(Gorimani, 1999).

However, the situation for children in the household appears to be quite different. That is, when the household is reporting conditions of food insecurity severe enough to provide clear evidence of hunger for adults, this in itself does not indicate that children in the household are hungry, especially if they are young children.

Rasch Basics

The Rasch measurement model, which was developed primarily in the educational testing field, assumes an underlying continuum--in the present case, of the severity of food insecurity experienced by the household--upon which both items and households can be located, and assumes that the probability of a household affirming a specific item depends on the relative severity of the household and the item. The single-parameter Rasch model, which is used to create the food (in)security scale, assumes specifically that the log of the odds of a household affirming an item is proportional to the difference between the severity level of the household and the severity level of the item. Thus, the probability that a household at severity-level h will affirm an item at severity-level i is:

ph,i=e(h-i)/(1+e(h-i))

Where e is the base of the natural logarithms.

Empirical research on food security using food (in) security scale

Kyaw (2009) performed a food security and coping strategy in Magway division, Myanmar. He argues that about 60 percent of the sampled rural households in Myanmar are food insecure. He also discovered that 79 percent of small farm household and 45 percent of medium farm households experience food insecurity. He found that only 14.3 percent of the large farm households are classified as food insecure. He also discovered that borrowing rice, eat low quality or cheaper rice, not eating meats, dropping children from school, migration and selling out of the land and livestock assets are the main coping strategies they respondents use.

Tollosa (1996) study highlighted that 40 percent of the sample farm households in Arsi zone (a zone known as a surplus producing area in the Ethiopia) faced seasonal food shortage. Similarly, Negash (2000) found that 30 percent, 21 percent, and 40 percent of the sample households in Meket, Habru and Gubalatfto woreda of North Wollo Zone, respectively of Ethiopia, were unable to satisfy their family's food demand for more than five months in a year. Mengistu, Regassa, and Yusufe (2009) work in Southern Ethiopia uncovered a precarious situation where more than half of the small rural householders face both seasonal and continual food shortage.

Food security Programmes

Reducing the number of people suffering from hunger by 2015 is a priority for the European Union and has also been set by the international community as the first Millennium Development Goal. Chronic hunger affects 925 million people worldwide - most of them in Sub-Saharan Africa and in South Asia. The

recent rise in food prices has pushed an additional 44 million people into poverty in low- and middle-income countries.

The European Commission considers food (in)security to be a key area where the EU can best support developing countries' efforts to speed up progress towards achieving MDGs. Adopted in May 2010, the EU policy on food (in)security has laid out a comprehensive framework to step up investment in sustainable agriculture and improve access to adequate and nutritious food. In parallel and in close coordination, the EU policy on humanitarian food assistance was adopted, outlining the EU's commitment to provide food assistance in the most efficient and effective manner, using the tools that are most appropriate for a given crisis context (food aid, cash and vouchers etc.) Moreover, the Green Paper consultation on the future of EU Development Policy carried out earlier this year clearly identified agriculture and food security as key areas for the EU in order to promote inclusive and green growth in partner countries.

Concrete results on the ground

In Pakistan, farmers have been producing less year on year because the cost of seeds and fertilizers has shot up, while food prices also increased due to dry weather. Last year, farmers managed to stop the downward spiral thanks to assistance through a joint EU, WFP and FAO project under the EU Food Facility. Instead of going into debt, 23,000 Pakistan farmers received 400 kg of wheat from the WFP to take them through the lean season before harvest. This enabled them to buy seeds, fertilizers and water pumps that growers used to plant a bumper crop. In irrigated areas the production has almost doubled because of the quality input received. Bakhtawar Mai, a smallholder farmer involved in the

project finally grew enough food to feed her family. “My harvest was excellent last year. I produced almost twice as much wheat as I did the year before,” Bakhtawar Mai says. While WFP is providing food assistance, FAO helps small-scale farmers increase their production – in 2009 close to 100,000 of the Pakistan farmers received agricultural inputs. The overarching aim is to make more food available for over 1 million of the country's most vulnerable.

In Guatemala, the Food Facility allowed 14,000 small-holders farmers' families to receive fertilizer; "This is a great help to families living in extreme poverty and who have no money to buy fertilizer," says Beteta Arnulfo, a farmer who lives with his wife and three children in the community of Mines, in the Quiché Department. Now they can produce more maize, which represents a better income and an increase in stocks for consumption.

In Zimbabwe, in 2009 the EU together with the FAO started a major operation in support of small scale farmers, financed under the Food Facility. 26 000 tons of seeds and fertilizers were distributed to 176 000 vulnerable farmers - representing between 10 to 15 percent of communal farmers in the country.

In Nepal, the Commission's Humanitarian Aid department (ECHO) supports WFP for the distribution of food to Bhutanese refugees who were part of a Nepalese community evicted from Bhutan in the 1990s and who have been since living in camps. This is considered a "forgotten" crisis. Whilst many of these refugees have been resettled in third countries, those still in the camps are dependent on the international community since Nepal does not allow them to carry out any official economic activity and there is no agreement on their possible return to Bhutan. Since 2001, ECHO has provided funding of more than € 30 million, mostly channelled through WFP.

In Haiti, after the earthquake in January 2010, the EU funded emergency food supplies through the WFP to the victims in the immediate aftermath. The disaster also meant that the population's livelihoods were severely paralysed, depriving them of the income on which they relied to feed their families. Damage to the port also meant that rice imports were limited, leading to shortages and high prices in the markets. It was therefore decided that the population would need a combination of food commodities and cash support. Food was provided through the WFP to compensate for rice shortages, and the cash compensated for livelihood losses.

In March 2015, in the presence of Jordan's agricultural minister, akef alzoubi, FAO Director-General Jose Graziono da silva initiated three projects to improve food (in)security and nutrition by making data available to decision-makers and preventing the spread of animal diseases across borders. By improving analysis and data sharing between UN agencies, NGOs and governments on food (in)security, the new information network will allow better-informed interventions for vulnerable populations and ensure that the limited resources are applied where they are needed most.

Food security programmes in fisheries

In May 2014, the Ministry of Marine Affairs and Fisheries of Indonesia and Wageningen University and Research centre, started a 3 year project to enhance the availability and accessibility of safe and quality fish and fish products for the Indonesian consumers. The project is jointly funded by both governments, with the Centre for Development Innovation (CDI) – Wageningen UR acting as the

Implementing Agency. Dutch partners in this project are: RIKILT, IMARES, LEI, Wageningen University and the NVWA.

The projects objectives are:

Increased availability of safe and good quality fish and fish products for the domestic market;

Increased accessibility of safe and good quality fish and fish products for the domestic market;

Improved aspiration of Indonesian consumers to consume fish and fish products, with an emphasis on fisheries and fish farming community members; Improved quality control in fish and fish products.

Fisheries programme goes beyond making fish available and accessible. It goes even as far as in fisheries management-down to community level management. In 2012 and early 2013, consultations were held between the Kiribati Ministry of Fisheries and Marine Resources Development (MFMRD) and a community-based fisheries management (CBFM) project team to identify pilot trial sites and potential areas of focus for CBFM interventions. These consultations resulted in agreement that pilot trials should be held in North Tarawa and Butaritari. A site-scoping visit was subsequently undertaken in North Tarawa in 2013. The report concludes with an initial fisheries context summary for these pilot trials and recommends potential areas of focus to be developed in subsequent community fisheries projects.

The Indonesian government and the Wageningen University and Research Centre have launched a project called the 'Project for Fisheries and Aquaculture for food security in Indonesia' with the aim to enhance food security and reduce malnutrition in Indonesia through increasing the availability of various fish

products on Indonesia's domestic market. Another food security programme in fisheries worth mentioning is the SmartFish programme. SmartFish is a regional fisheries project managed by the Indian Ocean Commission, funded by the European Union and co-implemented by the Food and Agriculture Organization of the United Nations. SmartFish, which operates in twenty countries throughout the Indian Ocean Region, Southern and Eastern Africa, focuses on fisheries governance, management, monitoring control and surveillance, trade, and food security. The SmartFish Programme aims at contributing to an increased level of social, economic and environmental development and deeper regional integration in the ESA-IO through improved capacities for the sustainable exploitation of fisheries resources.

To enhance food security, the council for scientific and industrial research has launched a project called SECUREFISH. It aims to address postharvest losses comprehensively in the fisheries sector. The project aims to train fishermen/ women, processor and consumers in various activities that will help promote food security.

A friend of the Nation (FoN) was in 2014 selected as one of the implementing partners for the five-year Sustainable Fisheries Management Project (SFMP). The United States Agency for International Development (USAID) has committed approximately $24 million dollars to the SFMP to contribute to food security in Ghana. The project will last from October 2014 to October 2019. The fisheries management project has the objective to rebuild Ghana’s marine fisheries stocks and catches through facilitating adoption of responsible fishing practices. It complements the Government of Ghana’s fisheries development objectives and USAID’s Feed the Future (FtF) Initiative

goals of improved food security, economic growth and poverty alleviation. This project, which will contribute to consolidating the gains made by the Integrated Coastal and Fisheries Governance (ICFG) Initiative (2009-2014), will also contribute to the strengthening of marine and fisheries management training at the University of Cape Coast (UCC).

Determinants of Food security

Factors that affect household food security in various developing countries especially in Africa have been documented in some literature and these factors or determinants are most often than not location-specific (i.e. different study areas were found to have variant attributes as food security determinants with some attributes recurring). Several works have been done using probit model to discover that sex of household head, educational level, age and income have positive influence on food security whereas household size has negative influence on household food security. A study by Sikwela (2008) in South Africa using logistic regression model showed that per aggregate production, fertilizer application, cattle ownership and access to irrigation have positive effect on household food security whereas farm size and household size have negative effect on household food security.

Babatunde et al. (2007) is another detailed work on food insecurity in Nigeria. The study utilized a three-stage random sampling technique to obtain a sample of 94 farm households and a cross sectional data in year 2005. Using the recommended calorie required approach; the study revealed that 36 per cent and 64 per cent of the households were food secure and food insecure respectively. The Shortfall/Surplus index showed that the food secure households exceeded the

recommended calorie intake by 42 per cent, while the food insecure households fell short of the recommended calorie intake by 38 per cent. A logit regression model estimated showed that household income, household size, educational status of household head and quantity of food obtained from own production were found to determine the food security status of farming households in the study area.

Feed the Future Initiative

The government of the United States has taken up an initiative along with other local government agencies as well as global partners, the G8 countries, and donors to reduce global hunger and to improve food security condition in the world. Exploiting the G8 Summit of 2009 held in L'Aquila, Italy, and President Barack Obama insisted global leaders to revert the three-decade old trend of reduced agricultural investment, and instead, choose to increase cash flow in their respective agricultural sectors in a drive to bolster global food security. This led to the birth of the "Feed the Future" programme.

Initially, the U.S had been successful in collecting above $18 billion as funds for the programme from the G8 countries as well as other donors. The "Feed the Future" initiative is presently led by the U.S Agency for International Development and has the support of other government-funded bodies like the State Department, Peace Corps, Millennium Challenge Corporation, the Treasury Department, U.S. Trade Representative, Overseas Private investment Corporation, the U.S. African Development Foundation, and the U.S Department of Agriculture.

The target group of this initiative is the smallholder farmers, especially women. Feed the Future has plans to help partner countries to develop their agricultural sector with an aim to improve their agricultural output. Spurt in economic growth would ultimately lead to higher income and help into eradicate hunger, poverty as well as under nutrition from the society. This initiative is expected to work on the basis of country-led priorities that call for consistent support by the governments, donor organizations, the private sector, and the civil society to accomplish its long-term goals.

Feed the Future in Ghana

Over the past 20 years, Ghana's impressive economic growth and poverty reduction have made it an African success story. The country's gross domestic product has grown between four to eight percent annually over the past decade and is expected to continue growing at a rapid pace in the coming years. This growth has resulted in a reduction in poverty rates from 52 percent to 28 percent over the past 10 years and puts Ghana on track to reach the first Millennium Development Goal of cutting poverty in half by 2015.

The agriculture sector is the largest source of employment in Ghana and the sector's consistent growth, led by the Government of Ghana, has been a major driver of poverty reduction. However, much of the recent growth has been driven by land expansion rather than improved productivity and gains have been concentrated primarily in southern regions of Ghana, while northern Ghana has significantly higher levels of under nutrition and poverty.

Engaging in the Policy Dialogue

Feed the Future is supporting the Government of Ghana to address three policy priorities highlighted in Ghana's New Alliance Cooperation Framework: improved policies on inputs; a secure environment for inclusive private sector investment; and a transparent, evidence-based, and inclusive policy process. Technical assistance will support Ghana to meet its policy commitments in each of these areas, including completion of regulations to implement a new seed and fertilizer law, a land bank and model lease agreement to improve land tenure for responsible private sector investment, and development and implementation of a more robust annual agricultural survey. In addition, Feed the Future is supporting improved governance to replenish Ghana's depleted marine fisheries, an important source of protein and a way of life for coastal fishing families. Through these efforts, Feed the Future, the Government of Ghana, and other donors are working to strengthen the country's agriculture and food security policy system.

Conceptual Framework

In other to perform an evaluation of the integrated coastal fisheries governance programme, some issues were identified and investigated. It is the believe that an assessment of this issues will help in achieving a successful evaluation. The issues and how they relate to each other are described in the framework below. The issues are programme description, food security status of household, household characteristics and effect of the programme.

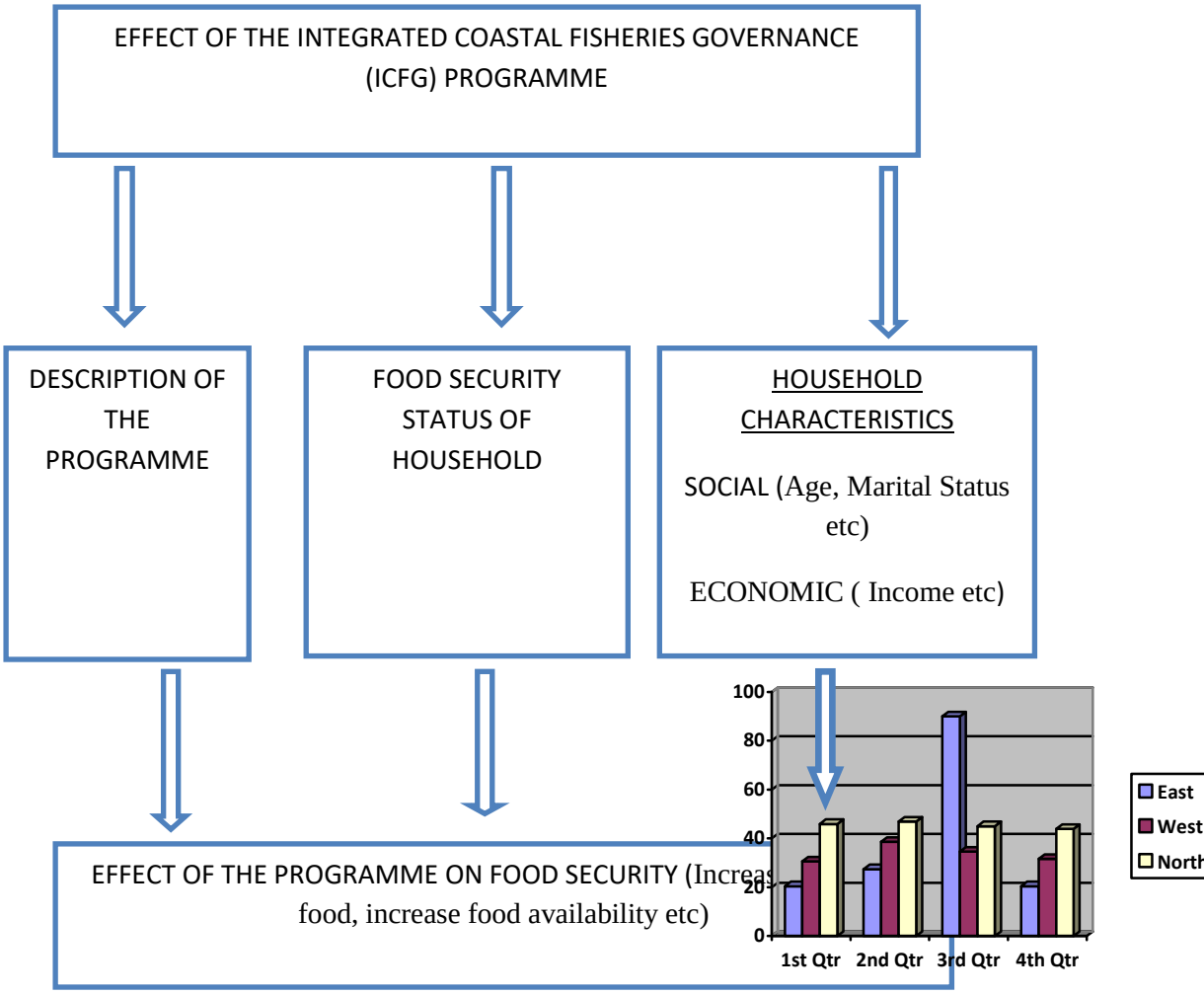

Figure 1: Conceptual Framework of effect of ICFG on food security status of fishing Households in Shama District

Source: Authors Construct (2015)

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the methodology of the study. It discusses the research design, the population and sampling procedures, data collection and data analysis.

Study Area

Profile of Shama District: Brief History of Shama

Shama district was established through a Legislative instrument (LI. 1882) in 2007. Prior to this, it was a sub-metro under the administrative authority of the erstwhile Shama Ahanta East Metropolitan Assembly (SAEMA). The District Capital is Shama and it is located 15 km from Sekondi, the Regional Capital and 280 km West of Accra, the national capital.

Physical Characteristics

Shama district, with a land area of approximately 215km^2 is four times the size of STMA. It is bordered by STMA to the west and Komenda Edina Eguafo Abirem (KEEA) district to the east and the north by Mpohor Wassa East district. The district lies within the lowlands of the country with the elevation in most areas less than 80 metres. The landscape is generally undulating with an average height of about 70m. The highest elevation ranges between 150and 200 metres above sea level. There are also few areas, mainly the valleys of the main river that do not exceed 150 metres above sea level (Shama District Assembly, undated). The shoreline features are characterised by open sandy beaches with near shore

rocky bottoms and headlands in some areas. The coastline has eroded by an average of 100metres in the last 50 years. Typical shoreline erosion control structures are gabions and boulders. The surf energy is medium to high.

Local and traditional governance

Both local and traditional governance systems prevail in Shama District. While the local government derives from the national decentralised governance system, traditional governance is sanctioned by the Chieftaincy institution. Membership of the Shama District Assembly comprises District Chief Executive, a Member of Parliament who is an ex-officio member of the Assembly, 12 elected members and 6 government appointees. While the District Chief Executive is the political and administrative head, the presiding member – elected from the Assembly's membership – presides over the legislative and deliberative functions of the Assembly.

The district is sub-divided into 6 area councils – Shama Junction, Assorku Essaman, Inchaban, Shama, Supomu Dunkwa and Aboadze/Abuesi- and 64 unit committees. There are several departments and public agencies operating within the district. These include Departments of Agriculture, Non-formal education, Feeder roads, Community development, Police service, Judicial service, National disaster management organization etc. Relative to traditional governance, the Shama traditional area is headed by a paramount Chief with jurisdiction over three main Chieftain Divisions and several divisional chiefs. The 3 Chieftain Divisions are Inchaban, Yabiw and Dunkwa. All traditional stool lands are vested in the paramount Chief of the traditional area (Shama District Assembly, undated).

Demographic Characteristics

By the year 2000, the population of Shama district was an estimated 68,642. This increased to 88,314 by 2008. Of this number, 443,436 were males and 44,078 females. As of the year 2000, the growth rate in the district was 3.5 percent. This number was higher than the regional and national averages of 3.2% and 2.7% respectively. Areas with high population density include Shama, Aboadze and Abuesi which are fishing communities. Other highly populated areas are Inchaban and Supomu Dunkwa. The indigenes are Fantes, constituting 86.49% of the total population while settlers account for 13.51%. Christianity is predominantly practiced by 78.6% of the population. Since the last 3 decades, the district has witnessed an increase in the number of basic and secondary schools. However, performance at the basic education level has consistently fallen in the past decade. There are 4 private clinics and 3 government health centres in the district. The most prevalent diseases recorded in the district as of 2009 include Malaria, Acute Respiratory Infection, Skin Diseases and Ulcer, Diarrhoeal Diseases, Intestinal worms, Rheumatism and Tout Pains, Hypertension, Anaemia, Vaginal Discharge, Home Accidents and Injuries and Other Diseases. Fertility in the district is quite high with 2,115 pregnancies in 2008 increasing to 2,491 in 2009.

Economic Activities, Livelihoods and Quality of Life

The economy of the district revolves around fishing, farming and petty trading. Shama has a long history of fishing pre-dating the colonial era. This period was characterised by the use of paddle canoes until the advent of outboard motors in the 1960s paved way for operating *adi* and drift gill nets. According to

key informants in the district, fishers adopted *watsa* by the 1970s due to the labour intensiveness of removing fish from drift gill nets. It is also worthy to note that majority of fishers in Shama were erstwhile employees of the public sector – Ghana Railway Corporation- particularly from the 1960s to 1980s. The retrenchment of railway workers, which began in the 1980s was a significant factor that drove people into the artisanal fishing industry around this time. The annual fish catch in the district is estimated at 30, 000 metric tonnes (Shama district assembly, undated)

Like fishing, farming in Shama district is a major occupation for the population. Both cash and food crops are cultivated and these include plantain, cocoyam, maize, rice, oil palm, cassava and vegetables. Tiger nuts and groundnuts are also cultivated on commercial scale. Prior to the 1980s, coconut plantations was a major source of livelihood for the people until the incidence of Cape Saint Paul wilt disease resulted in destruction of large hectares of coconut farms. According to statistics from the district assembly, 78% of the population are engaged in farming and fishing. There is a direct correlation between fishing and trading in this district. The most recent bumper fish catch in the district was recorded in 1989 and 2001. Emerging trends indicate declining fish catches which is contributing to loss of livelihoods and reduced quality of life.

Environment

The district is drained by the historical Pra river which flows southwards and meets the sea at Shama. The Pra river delta comprises vast areas of marshlands while its estuary is associated with mangrove forests, dunes with tropical foliage, and various species of birds which perhaps are migratory and

diverse fauna. Some coastal wetlands and mangrove forests in the district have been degraded through filing and harvesting for fuel wood. However, as compared to STMA, wetland areas and overall natural ecosystems in Shama district is less stressed.

Climate

The District lies within the tropical climatic zone and experiences two (2) rainy seasons. The major season: March-July and its minor season is from September – November. It experiences a mean rainfall of about 138cm with a lower rainfall of 100cm and Highest rainfall 170cm. About 70% of the rainfall occurs in the season.

Temperature

Relatively mild temperatures are experienced in the District ranging between 22 ^{o}C and 28 ^{o}C. Temperature conditions readily support crop cultivation including cassava, oil palm, maize, coconut and vegetables among others.

Soil

Parent materials at the coastal areas have faulty shelves and sand of various types resting on hard basement of granite, gneiss and schists. Non coastal areas have lower Birimian, Dixcove granite, Cape Coast granite soils. Sandy to sandy-loams is predominant.

Research design

Research designs are chosen to ensure reliability and validity of data and findings and to help make appropriate inferences. The design of a study defines the study type and sub-type. Research design is the framework that is created to seek answers to research questions. For the purpose of this study, the cross-sectional research design was adopted. In this type of research study, either the entire population or subset thereof is selected, or from these individuals, data are collected to help answer research questions of interest. It is called cross-sectional because the information about the phenomenon that is gathered represents what is going on at only one point in time.

Cross-sectional survey design is the appropriate design for the study because data were collected to make inferences about the population of interest at one point in time. In this case, the population of interest includes households in Shama district, Western Region. Cross-sectional surveys have been described as snapshots of the populations about which data are gathered. Cross-sectional survey design can be conducted using any mode of data collection.

Study population

A population is a complete set of people with a specialised set of characteristics (Banerjee, Chaudhury, Singh, Banerjee & Haldar, 2010). The target population includes all fishing household in Shama District that are beneficiaries of the integrated coastal fishery governance programme. These groups considered more relevant to research topic of assessing the perceived effect of the integrated coastal fishery governance programme on the food security status of fishing household in the Shama district.

Sampling procedure

A multi-stage sampling technique was used to obtain the appropriate sample size for the study. At the first stage, cluster sampling technique was adopted to divide the fishing household into four clusters based on the type of fishing vessel used for the fishing activity. The four clusters obtained were: ALI, DGN, Set Net, Wotse.

The list of all activity DGN and Ali fishing vessels were then obtained from the fisher's office in the district. At the time of the study only 15 DGN and 10 Ali vessels were currently operating actively in the Shama district. This gave a total of 25 active vessels. The entire 25 vessels was then included in the study as the sampling frame. Each vessel contained about 7-12 fishermen, giving a total of about 300 fishermen.

To maximize the degree of representativeness of the study, the Yamane's (1967) simplified formula was used to determine the suitable sample size. The formula is given as;

$$n = \frac{N}{1+N(e^2)}$$

Where "n" represent the suitable sample size to be used for the study; "N" is sample frame obtained from the target population and "e" is the precision (a precision of 0.05 was adopted based on pretest results). This gave a sample size of 172 fishermen.

The next stage involved a simple random sampling technique in selecting the 172 respondents from the cluster. The lottery method was adopted as the tool in selecting the individual active fishermen to be part of the study. The selected individual fishermen were then contacted and interviewed using a structured

interview schedule. However, at the end of the survey only 140 respondents were covered given a response rate of 81 percent.

In order to obtain rigour of research and to make sure any effect found in the study was not a result of confounding variables, fishermen in Abrobe Ano were picked to be used as the control group for the research. Abrobe Ano is a fishing community close to Shama. Abrobe Ano has very similar fishing characteristics to Shama fishing community which makes it suitable as a control group. Similar procedure used to obtain the sample size for the shama fishing community was used to select 140 fishermen from Abrobe Ano for the study.

Data Types and Sources

In tackling objective one, which is a description of the integrated coastal fishery governance programme, secondary data were used. Data were synthesised from several project documents. Input/output data and primary data were used for objective two, objective three, and objective four.

Data Collection Methods

Data were collected on household socio-economic characteristics, nature and time of food consumption. Primary data from the field was used for the study. Primary data were collected through the use of open and close ended interview schedule. Data was generated from sources such as Ghana Statistical Service, journals, theses, reports as well as other publications.

Interview schedules hold several advantages over other instrumentations like reducing interviewer bias to a minimum and achieving the highest degree of objectivity and uniformity in procedure. Field assistance was employed to help

with the data collection. Data were collected in Shama fishing community on the 23-25 March, 2015 and in Abrobe Ano on the 11-14 May, 2015.

Data analysis

The study employed both descriptive statistics and inferential statistics. Descriptive statistic such as mean and standard deviation, were used to characterise households food security status and frequency of occurrence of food shortage. Inferential statistics like paired sample t-test and binomial regression analysis were used to answer effects of the programme and determinants of food security respectively. The results were presented in tables, pie chart and bar graph with the aid of frequencies and percentages.

Objective one

Objective one will be answered through scenario building by synthesising several project documents.

Objective Two

Household Food (in) security Measurement

Food security status was measured using the food (in) security scale. Food (in) security scales are a set of questions when answered determines the food security status of households which can be aggregated for a particular population

Table 3

Questions Included in the Food (in) security scale

Question Number	Question
Q1	Which of these statements best describes the food eaten in your household in the last 12 months: we always have enough to eat and the kinds of food we want; we have enough to eat but not always the kinds of food we want; sometimes we don't have enough to eat; or often we don't have enough to eat?
Q1a	*(IF SOMETIMES OR OFTEN NOT ENOUGH TO EAT)* Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why you don't always have enough to eat. Not enough money for food Too hard to get to the store On a diet No working stove available Not able to cook or eat because of health problems
Q1b	*(IF ENOUGH FOOD, BUT NOT THE KINDS WE WANT)* Here are some reasons why people don't always have the kinds of food they want or need. For each one, please tell me if that is a reason why you don't always have the kinds of food you want or need. Not enough money for food Too hard to get to the store On a diet Kinds of food we want not available Good quality food not available
Question Number*	Question
	Optional preliminary screen
Stage 1	
Q2	Now I'm going to read you several statements that people have made about their food situation. Please tell me whether the statement was often, sometimes, or never true in the last 12 months. "I ***worried whether our food would run out*** before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?
Q3	"The ***food that we bought just didn't last***, and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
Q4	"We ***couldn't afford to eat balanced meals."*** Was that often, sometimes, or never true for you in the last 12 months?
Q5	"***We relied on only a few kinds of low-cost food to feed the children*** because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?

Table 3 continued

Q6	"We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months? ***1st-Level Internal Screen***
Stage 2:	
Q7	"The ***children were not eating enough*** because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?
Q8	In the last 12 months, did ***you or other adults*** in your household ever ***cut the size of your meals or skip meals*** because there wasn't enough money for food?
Q8a	How often did this happen — almost every month, some months but not every month, or in only one or two months?
Q9	In the last 12 months, did you ever ***eat less than you felt you should*** because there wasn't enough money to buy food?
Q10	In the last 12 months, were you ever ***hungry but didn't eat*** because you couldn't afford enough food?
Q11	Sometimes people lose weight because they don't have enough to eat. In the last 12 months, did you ***lose weight*** because there wasn't enough food? **Question** **2nd – level internal screen**
Stage 3	
Q12	In the last 12 months, did ***you or other adults*** in your household ever ***not eat for a whole day*** because there wasn't enough money for food?
Q12a	How often did this happen — almost every month, some months but not every month, or in only one or two months?
Q13**	In the last 12 months, did you ever ***cut the size of any of the children's meals*** because there wasn't enough money for food?
Q14**	In the last 12 months, did any of the ***children ever skip meals*** because there wasn't enough money for food?
Q14a**	How often did this happen — almost every month, some months but not every month, or in only one or two months?
Q15**	In the last 12 months, were the ***children ever hungry*** but you just couldn't afford more food?
Q16**	In the last 12 months, did any of the ***children ever not eat for a whole day*** because there wasn't enough money for food?

** questions asked only of households with children

The four kinds of situation are:

- Anxiety or perception that the household food budget or food supply was inadequate (Q2, Q3);

- Perceptions that the food eaten by adults or children was inadequate in quality (Q4, Q5, Q6);
- Reported instances of reduced food intake or consequences of reduced intake, for adults (Q8, Q8a, Q9, Q10, Q11, Q12, Q12a); and
- Reported instances of reduced food intake or its consequences for children (Q7, Q13, Q14, Q14a, Q15, Q16).

Table 4
Food security Scale Values and Status Levels Corresponding to Number Of Affirmative Responses

Number of affirmative response:		1998 food (in)security scale values	Food (in)security Status level	
(Out of households) Households with children	(Out of 10) Households without children		Code	Category
0	0	0	0	food secure
1		1		
	1	1.2		
2		1.8		
	2	2.2		
3		2.4	1	food insecure without hunger
4		3		
	3	3		
5		3.4		
	4	3.7		
6		3.9		
7		4.3		
	5	4.4		
8		4.7	2	food insecure with hunger (moderate)
	6	5		
9		5.1		
10		5.5		
	7	5.7		
11		5.9		
12		6.3		
	8	6.4		
13		6.6	3	food insecure with hunger (severe)
14		7		
	9	7.2		
15		7.4		
	10	7.9		

Table 4 continued

16	8
17	8.7
18	9.3

Source: Calculated by ERS from August 1998 Current Population Survey Food Security Supplement data.

Objective Three

Effect of the Programme

In order to find the effect of the programme on food (in) security status of households, a comparative analysis was used. Comparative analysis is an item-by-item comparison of two or more comparable alternatives, processes, products, qualifications, sets of data, systems, and item of such nature. Przeworski and Teune (1970) mentioned that comparative analysis can be used to compare similar cases as well as cases that are non-similar. To obtain rigour and account for confounding variables of the research, both Before and After comparison and With and Without comparison was used. Before and after was used to compare the households food (in)security before the programme and after the programme to find out if the programme had an effect on the food (in)security status. In order to account for confounding variables, a further comparison group was chosen to undertake a With and Without comparison analysis; another community which did not partake in the programme but has similar characteristics as Shama. Paired sample t-test was used to analyse the effect of the programme.

Paired Sample T –Test

Paired sample t-test is a statistical technique that is used to compare two population means in the case of two samples that are correlated. Paired sample t-test is used in 'before-after' studies, or when the samples are the matched pairs, or when it is a case-control study. For example, if we give training to a company employee and we want to know whether or not the training had any impact on the efficiency of the employee, we could use the paired sample test. We collect data from the employee on a seven scale rating, before the training and after the training. By using the paired sample t-test, we can statistically conclude whether or not training has improved the efficiency of the employee.

Steps:

1. **Set up hypothesis:** We set up two hypotheses. The first is the null hypothesis, which assumes that the mean of two paired samples are equal. The second hypothesis will be an alternative hypothesis, which assumes that the means of two paired samples are not equal.

2. **Select the level of significance:** After making the hypothesis, we choose the level of significance. In most of the cases, significance level is 5 percent
3. **Calculate the parameter:** To calculate the parameter we will use the following formula:

$$t = \frac{\bar{d}}{\sqrt{s^2 / n}}$$

Where d bar is the mean difference between two samples, s^2 is the sample variance, n is the sample size and t is a paired sample t-test with n-1 degrees of freedom. An alternate formula for paired sample t-test is:

$$t = \frac{\Sigma d}{\sqrt{\frac{n\left(\Sigma d^2\right) - \left(\Sigma d\right)^2}{n-1}}}$$

4. **Testing of hypothesis or decision making:** After calculating the parameter, we will compare the calculated value with the table value. If the calculated value is greater than the table value, then we will reject the null hypothesis for the paired sample t-test. If the calculated value is less than the table value, then we will accept the null hypothesis and say that there is no significant mean difference between the two paired samples.

Assumptions:

1. Only the matched pairs can be used to perform the test.

2. Normal distributions are assumed.

3. The variance of two samples is equal.

Objective Four

To ascertain the determinants of the households' food security status, a Binomial Logistic Model was used. Binomial Logistic Model was employed because of the dependent variable.

Binomial Logistic Model

Logistic regression analysis was employed to analyse the determinants of household characteristics on food security. Logistic regression, or logit regression, is a type of probabilistic statistical classification model. According to

Bishop (2006), Binomial Logistic Model is also used to predict a binary response from a binary predictor, used for predicting the outcome of a categorical dependent variable (i.e., a class label) based on one or more predictor variables (features). That is, it is used in estimating the parameters of a qualitative response model. The probabilities describing the possible outcomes of a single trial are modelled, as a function of the explanatory (predictor) variables, using a logistic function. Frequently "logistic regression" is used to refer specifically to the problem in which the dependent variable is binary—that is, the number of available categories is two—while problems with more than two categories are referred to as multinomial logistic regression or, if the multiple categories are ordered, as ordered logistic regression.

Logistic regression measures the relationship between a categorical dependent variable and one or more independent variables, which are usually (but not necessarily) continuous, by using probability scores as the predicted values of the dependent variable as such it treats the same set of problems as does probit regression using similar techniques. Data will be analysed using the Statistical Package for the Social Sciences (SPSS) and the R Statistical Environment.

The basic model of the Logit estimation is as follows:

$$P_i = Prob(Y_i = 1) = \frac{1}{1+e^{-(\beta_0+\beta_1 X_{1i}+.....\beta_k X_{ki})}}$$

$$= \frac{e^{(\beta_0+\beta_1 X_{1i}+.....\beta_k X_{ki})}}{1+e^{-(\beta_0+\beta_1 X_{1i}+.....\beta_k X_{ki})}} .....(1)$$

Similarly,

$$P_i = \Pr ob(Y_i = 0) = 1 - \Pr ob(Y_i = 1)$$

$$= \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_{1i} + \ldots\ldots\ldots \beta_k X_{ki})}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Dividing (1) by (2) we get

$$\frac{\Pr ob(Y_i = 1)}{\Pr ob(Y_i = 0)} = \frac{P_i}{1 - P_i} = e^{(\beta_0 + \beta_1 X_{1i} + \ldots\ldots\ldots \beta_k X_{ki})} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where P_i is the probability that Y takes the value 1 and then $(1-P_i)$ is the probability that Y is 0 and e the exponential constant. This research uses information criteria as technique for providing the basis for model selection. Most commonly used information criteria such as Akaike Information Criteria (AIC) is employed. The idea of AIC (Akaike, 1973) is to select the model that minimises the negative likelihood penalised by the number of parameters as specified in the equation (4). $AIC = -2\log(L) + 2p$ …… (4), where L refers to the likelihood under the fitted model and *p* is the number of parameters in the model. Specifically, AIC is aimed at finding the best approximating model to the unknown true data generating process and its applications (Akaike, 1973).

Dependent and explanatory variables

The dependent variable of the study is a binary response, that is, whether households are food secure or food insecure. The explanatory variables are chosen based review of literature and observation of Shama Fishing on socio-economic characteristics of households. These variables include highest education level, number of dependents, sex of household heads, ownership of

establishment, farm size, occupation of household heads, marital status of household head, working experience of household heads.

Empirical Model Specification

$$In\left[\frac{p(y_i=1)}{1-p(y_i=1)}\right] = \beta_0 + \beta_1(Vessel\ type) + \beta_2(vessel\ Owership) +$$

$$\beta_3(Working\ Experience) + \beta_4(working\ experience) +$$

$$\beta_5(Number\ of\ dependents) + \beta_6(Age) + \ldots\ldots..$$

The Model examines the determinants of household's food (in) security status. Therefore the dependent variable is the food secure or food insecure against the explanatory variables stated in the model.

Variables of the Study

The study seeks to understand whether the integrated coastal fisheries governance programme has had an effect on the food security of households in the Shama fishing community.

Table 5
Definition of the selected Variables of the study

Variables	Operationalization
Dependent variable	
Food (in)security	Food secure Food insecure
Explanatory Variables	
Age	Below 20 20-30 31-40 41-50 51-60 Above 60
Dependants	Total number of dependants of the household
Education Level	No Formal Education Primary Middle School/JSS Secondary Tertiary
Marital status	Single Married
Vessels used	ALI DGN Set Net Wotse
Working experience	Number of years respondent has been Working
Own vessel	Yes No
Income	Average income

Source: Field Survey data , 2015

A priory Expectation

The seeks to confirm whether the a priory expectations are confirm or rejected

Table 6

A Priory expectation

Variable	**A Priory expectation**
Age	Increase in age results in improvement in food security status
Dependents	Increase in dependents results in deterioration of food security status
Educational level	Higher education level leads to better food security status
Marital status	Married couple are more food secure than Single people
Vessel type	Vessel Type used has no influence on food security status
Working experience	Higher experience results in better food security status
Vessel Ownership	Those who own vessels are more food secure than those do not own a vessel
Income	Higher income results in better food security status

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter presents results and discussions of the study. Essentially the chapter presents the results of the study in relation to the specific objectives; (1) Description of the Integrated Coastal Governance Programme, (2) To determine the food security status of fishing households (3). To determine effect of the programme on household's food security status (4) To ascertain the determinants of food security status of households in Shama district.

Description of the Integrated Coastal Fisheries Governance Programme

The Integrated Coastal Governance Programme (ICFG), locally refer to as a *Hen Puano,* is a multi-stage four year programme supported by the U.S. Agency for international development (USAID). The programme targets coastal districts of western region from Shama to Jomoro. The programme was implemented though a USAID cooperative agreement with the Coastal Resources Centre (CRC), Univeristy of Rhode Island (URI). The principal partners in the implementing of the programme were WorldFish Centre, SustainMetrix, Friends of the Nation, Fisheries Commission, and districts of the coastal western region. Several stakeholders were involved in the programme include government, private sector and non-governmental organizations (NGO) along the coast. The programme started from September 15, 2009 to September 14, 2013 with funding of US$12.5 million in USAID funds.

The programme aimed at playing a significant role in helping the government of Ghana achieve its developments objectives of poverty reduction,

food security, sustainable fisheries management and biodiversity conservation. However, in the four year period of programme executions, the main or central objective was:

To assemble the pre-conditions for a formally constituted coastal and fisheries governance programme that can serve as a model for the nation.

Project Phases

The ICFG initiative has been structured into three broad phases

- The First Phase ended in September 2010, and stressed on consultation, information synthesis and the preparation of a baseline that documents trends, current conditions and issues as they concern integrated coastal zone management(ICM) and governance in the coastal districts of the western region and in fisheries management and governance as they were envisioned by programme participants at the commencement of the project
- The second phase started in October 2010 and concluded in September 2012. It is devoted to specifying goals for improving coastal and fisheries governance in the coastal districts of the western region and generates examples of good practice in ICM and fisheries governance at the district and sub-district scale.
- The third phase built upon this experiences to articulate a viable model for coastal and fisheries governance. The model which was developed served as a blue print to offer Ghana an approach to build capacity for response to many pressures on coastal and fisheries resources that could be scaled-up to the nation as a whole.

Programme Components

Four broad projects were undertaken under the programme. These projects were targeted to the specific needs of the districts the programme encompassed. The projects were:

Population, health and environment (PHE)

PHE focused on Shama and Ellembelle districts with support from a sister programme of CRC called Building Actors for Livelihood and Advancing Communities Excellence in Development (BALANCED) with its base in the USA. The goal of this project was to increase awareness on PHE linkage that result in optimum human and ecosystem health.

Cape Three Point conservation

The programme formed a Cape Three Point Working Group. The group was a gathering of institutions with interest in conservation and sustainable use of the cape three points forest reserve and adjoining wetlands. The working group, among other tasks, helped in training of 160 persons from 16 communities, including 30 women, in the fundamentals of forest and wildlife laws, the identification of illegal activities in the forest, health and safety and offense handling. Community monitoring teams (CMTs) were formed from the trainees to monitor the Cape Three Point forest reserve. Tullow Oil corporate social responsibility funds were solicited to support monitoring by the CMTs. The Cape Three Points working group signed a MoU with the forestry commission. This allowed the ICFG support the process of updating the cape three point forest reserve management plan. A flora and socio-economic survey and fauna inventory assessment was completed and synthesised to update the management plan for the reserve.

Amanzule Wetland Conservation

Several activities targeted at conservation of the Amanzule wetlands were started and completed. These include:

Amanzule Working group developed conservation management scenario for Amanzule wetlands

Satellite imagery analysis for habitat discrimination and land use land cover change in the Amanzule wetlands

Bamboo feasibility studies to orient private sector investment for diversified livelihood activities and employment generation

Studies on carbon stocks in wetlands and REDD+

Fisheries governance

Major issues profiled within the fisheries sector for which the ICFG programme set out to assemble the enabling conditions for a fresh approach to fisheries management included:

• Pervasive use of illegal fishing methods, overcapacity and open access and declining harvest**.**

• Poor enforcement of fisheries laws and regulations, a result of law enforcement agencies not being very conversant with the fisheries laws and a capacity gap in law enforcement and prosecution**.**

• Policy gaps in fisheries sector, over-centralization of fisheries (heavily top-down) and weak capacity for fisheries management at local and national levels.

• Fishers' livelihoods under constant threat.

Measures to communicate the issues among stakeholders and to discuss new strategies were initiated, aimed at more detailed analysis and broader understanding of the challenges. These included:

Strengthened Ghana National Canoe Fishermen's Council (GNCFC). The Ghana Canoe Fishermen Council–Western Region (GNCFC-WR) was strengthened to reorganise its internal structures for adaptive fisheries management and encourage participation of women fish processors in the decision making within the Council and at the beach level**.**

Establishment of the Fisheries Working Group (FWG*)*. The FWG, constituted by stakeholders (leaders of the fleet, fish processors, law enforcement agencies, and civil society) from the Western Region, met regularly to discuss issues and challenges within the sector. It also provided advisory services to the Regional Director of the Fisheries Commission in the Western Region. The group was endorsed by the national Fisheries Commission.

Strengthening of the Fisheries Prosecution Chain strengthened. Initiative successfully advocated for the creation of a Western Region environmental court system to adjudicate environmental and fisheries offences. Institutions (Monitoring, Control and Surveillance Unit of Fisheries Commission, Navy, Marine and Judicial Police, Air Force, Attorney-General's Department and Judges) were identified and trained to ensure successful prosecution of fisheries infractions. During the period, 38 infractions were recorded, and 37 successfully prosecuted.

Training of some Marine Police – In collaboration with the Fisheries Commission and other stakeholders, trained the first batch (25 officers) of the

Marine Unit of the Ghana Police Service on the ecological justifications of the fisheries laws and social policing in fishing communities followed by further support for the Unit for outreach and education in the fishing communities. The outreach activities covered over 70 coastal communities in the Western Region.

Passing of the Fisheries Regulations (L.I. 1968) - Analysis and inputs were made regarding the Fisheries (Bill) Regulations. ICFG actively participated and supported meetings and workshops which led to the passing of the new Fisheries Regulations (LI 1968 of 2010).

Creation of the District and Community Fisheries Fora. The fisheries fora targeted fishing communities and the district assemblies and educated them on fisheries issues, eg. fishers activities that have resulted in a decline in fish catches, justifications of the fisheries regulations/laws. The fora led to the selection of 'champions' to lead the campaign for responsible fisheries and strengthening through capacity development for better fisheries management at the district and in communities in a co-management arrangement. In Dixcove (Ahanta West District), for example, a fishers association – the Dixcove Fisheries Co-management Forum was borne out of the process while in the Shama District, the Abuesi Fishers Drama Troupe was formed.

Completing of the Livelihood surveys–A baseline was provided for interventions in simplified nutrition in households in target communities and identified opportunities for livelihood diversification.

Introduction of the Concept of Adaptive Co-management– Fisher folks' conceptual base and understanding of adaptive co-management was deepened in the face of dwindling fish stock and climate change impacts in coastal

communities and oil and gas activities. These are squeezing fishers out of their traditional fishing grounds and landing sites. Fishers were also equipped with necessary skills for implementing co-management in practice.

Targeted Leadership Training – Capacity development was designed to strengthen the capacity of stakeholders to participate in co-management of fisheries identified by stakeholders as the best way forward for reversing the downward trend in fish production.

Diversified livelihood interventions for women. A group of 30 women trained in dressmaking and hairdressing in collaboration with Opportunity International Centre (OIC). This was in recognition of the role of women in fisheries and how their income earning activities can be used to reduce pressure on fishing through household income support. Introduction of concepts in livelihood skills such as improved education, business development and other business services (e.g., information centres, micro-finance) was aimed at improving individual abilities to identify and seize new livelihood opportunities.

Spatial Planning

Tullow oil funded spatial development frameworks for two districts. It was finalised in collaboration with ICFG initiative. The product from the exercise included:

- Profile of vulnerability issues
- Maps of coastal zone
- Policies supporting the maintenance of ecosystem goods and services

A marine and coastal management committee (MCMC) was formed with a mandate to carry out the policies. The ICFC facilitated capacity building sessions

for MCMC with a focus on climate change vulnerability assessment and adaption planning.

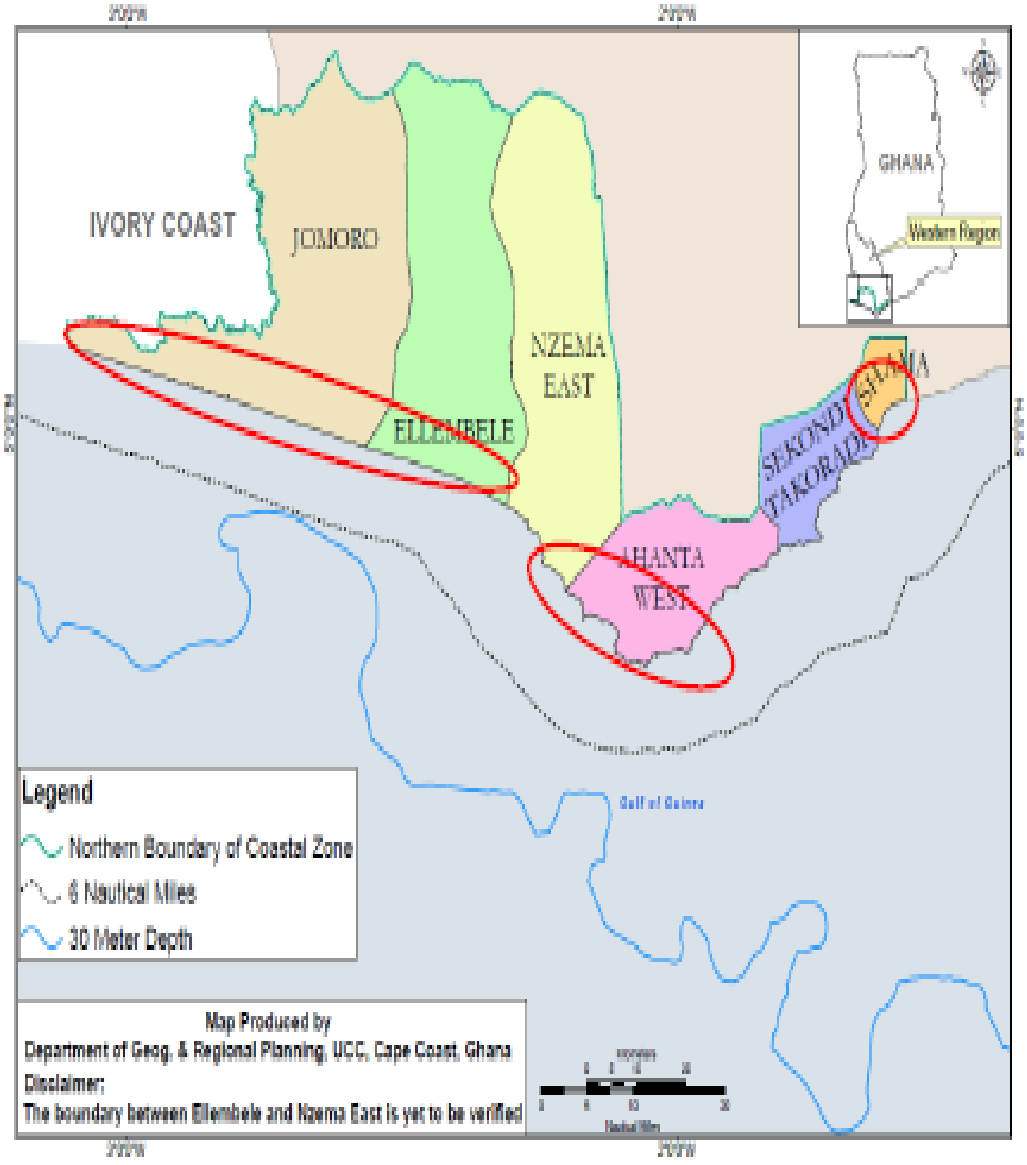

Figure 2 Map of Coastal districts ICFG was undertake

Programme Beneficiaries

The programme covers the six coastal districts of the western region, where coastal communities and their local governments are intended primary beneficiaries. The districts are Shama, Sekondi Takoradi, Ahanta West, Nzema

East, Ellembele, Jomoro. The programme focuses primarily on beneficiaries that are into fishing. However, there are beneficiaries that are non-fishing in nature

The Food security Status of Households

In order to perform the evaluation, the programme sought to find out the food security status of households in Shama fishing community. The research hypothesized that the households are food secure and an enquiry was made to find out if the assertion was true. The study uncovered that more than 80% of households were food insecure with varied degree of severity.

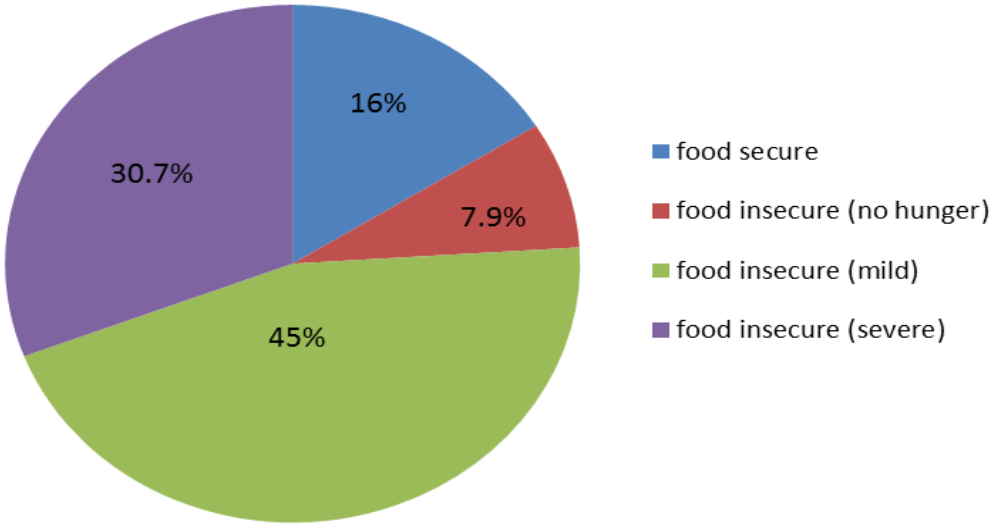

Figure 3: Food secure status of fishing households

The analysis of the data showed that only 16.4 percent of households interviewed were food secure. The rest were food insecure with varied degree on severity. The analysis of the data showed that 7.9 percent of households were food insecure but did not experience hunger and 45 percent of household were food insecure and experience mild hunger. The rest of the households representing 30.7 percent were food insecure and experienced severe hunger. Altogether, 83.6 percent of households are holds were found to be food insecure

whiles 16.4 percent were food secure. These findings are contrary to finding by MoFA, which states that 5 percent of Ghanaian population are food insecure. One out of five people, according to FAO (1996), in the developing world cannot get food in sufficient amount to meet their daily needs. However, this study discovered a higher and staggering figure of about 4 in 5 individuals to be food insecure. These findings are far higher than the findings from a research done in southern Ethiopia, which found that 54 percent of households face mild to severe food insecurity, and of which, about 19 percent fall in household hunger category. Based on the results, the null hypothesis is rejected.

The high level of food insecure that the research obtained may be due to the operational definition of food security. In other for one to be characterised as food secure, one has to have physical and economic access to food at all times to support a healthy life. Which means that the individual must be able to obtain food whenever its needed. It also means that the individual must not, at any point in time in the period being measured, go without food. This means the person has to be able to satisfy his desire for food whenever it's needed. This is a problem because fishing activities goes through cyclical yearly fluctuations. There are periods where the fishermen have plentiful harvest and periods where their efforts do not match the fish they catch. These fluctuations in catch translate to fluctuations in income, which also translate into ability to access food. This fluctuation in access to food means that they are food insecure.

Food security also takes into account individual preference. Food which is accessible must be what the individual wants at that point in time, the absence of which means the individual is food insecure.

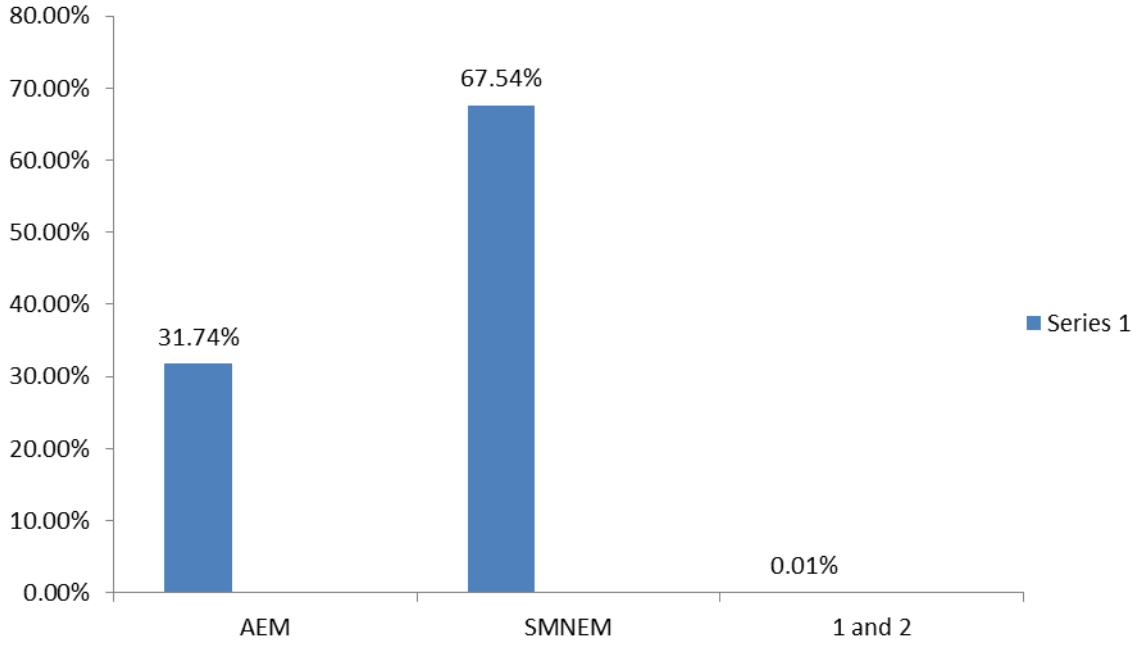

Figure 4: Frequency of Occurrence of Food Shortage

AEM= Almost Every Month

SMNEM= Some Months But Not Every Month

1 or 2= Only 1 and 2 months

The study also sought to find out the frequency of occurrence or how often the last 12 months that they were food insecure. The research uncovered some staggering revelations. The study revealed that 31.74 percent of the households experience food shortages about every month, 67.54 percent experience food shortage in some months but not every month and 0.01 percent of the population experience in food shortage. 83 percent of households said they worried that they will run of food before they had money to buy more while 16.4 percent said they had no such worries. 83 percent of households said the food they had run out before they had money to buy more while 16.4 percent said they did not experience that. 83.6 percent household said they could not afford to eat a balanced whiles 16.4 percent of household did not have such problems. Also,

83.6 percent household said they had to consume a few foods because of circumstances like heavy rainfall etc. whiles 16.4 percent of household did not have such problems

The study found that 83.6 percent household said they were unable to offer a varied diet because they had no money to do so and, 16.4 percent of household did not have such problems. The research uncovered 80 percent of household said they eat less than they wanted whiles 20 percent said they had no such difficulties. When ask if they ever felt hungry but did not eat because food was unavailable for purchase or just did not have money to buy food, 75.7 percent of household answered Yes and 24.3 percent said No. Most of the respondent (75.7 percent) said they lost weight because they were unable to eat properly or adequately whiles 24.3 percent said they did not experience any weight lost. 53.7 percent of household said they had periods within the last 12 months that adults in their household went the whole day without eating. Whiles 46.3 said they did not experience that. 30.7 percent said they had reduced the food intake of children whiles 69.3 percent said they did not do such a thing. When ask if they had situation where children in their household when without food for a whole day, 15 percent answers Yes and 85 percent answered No.

Determinants of Household Food (in) security status

In tackling the objective, it was hypothesized that a that the socio-economic characteristics such as income, number of dependents, age of fishermen, years of experience, are not predictors of the food security status of households. The results are shown below in table 7

Table 7

Determinants of food security status

VARIABLES	B	S.E	Wald	Sig.	Exp(B)/Odds ratio
X_1	-2.862	2.296	1.554	.213	.057
X_2	0.663	2.643	.063	.802	1.941
X_3	.226	.113	1.899	.046*	1.254
X_4	-4.307	2.248	3.670	.055*	0.013
X_5	-1.298	.599	4.686	.030*	.274
X_6	.312	0.133	5.495	.019*	1.366
X_7	3.099	1.128	7.548	.006**	22.165
X_8	3.477	1.277	7.412	.006**	32.376
Constant	-26.213	9.077	8.340	.004**	.000

Source: Survey, field data, 2015 Significant codes: 0.01**, 0.05*, 0.1.,

Variable(s) X_1: Vessel type, X_2: Own vessel, X_3: Experience, X_4: Marital status, X_5: Number of dependents, X_6: Age, X_7: Educational level, and X_8: Average income.

Table 8

Model Summary

STEP	-2 Log likelihood	Cox& Snell R Squared	Nagelkerke R Squared
1	21.204	0.524	0.887

Logistic Regression equation for food security

The results above in Table 7 is a t-test that shows the Cox and Snell R squared and Nagelkerke R squared (both of which are model predictors) have values of 0.524 of 0.887 respectively. Wald is a chi squared test that test the null hypothesis that the effect of a variable is equal to zero (X_a=0) and therefore not significant. However, all of the variables have values greater than zero (X_1=1.554, X_2=0.063 etc.) This goes to show that they are significant predictors and so have effect on the dependent variable. These values indicate that the model fits well and hence cannot be rejected. The results in table 7 show the estimated coefficients of the variables for food security status of households in Shama district. Four explanatory variables: experience, marital status, number of dependents and age were found to be significant at 0.05 significant level with significant values of 0.046, 0.055, 0.030, and 0.019 respectively. Average income and educational level were significant at 0.01 significant level with values of 0.06. This means that the variables are significant predictors of household food security status. Vessel type and ownership of vessel were not significant at neither 0.05 nor 0.01 significant level. This means that they are not significant predictors of household food security with values of 0.213 and 0.802 respectively.

Using this set of eight (8) predictors, the logistic regression equation for the log-odds in favour of food security is estimated to be:

$$\text{Log}_e [FS/1\text{-}FS] = - 26.213 – 2.862X_1 + 0.663X_2 + 0.226X_3 – 4.307X_4 – 1.298X_5 + 0.312X_6 + 3.099X_7 – 3.477X_8$$

Using the odds ratios, the analysis shows that households with single or unmarried persons as household head turn to be about 7.7 times more likely to be food secure than households with married couples. This result is surprising

because one would reason that households with married couples can draw on each other to provide for the food, thereby become food secure. The outcome can be attributed to the fact that household with single person as head may have one less person to spend money on. This finding was contrary to findings by Haliu and Regassa (2007) in Ethiopia and also contrary to the works of Kaloi, Tayebwa, and Bashaasha (2005) in Uganda.

Household size had a negative but significant relationship with food security, implying that the probability of food security decreases with increase in household size. Those with less dependents turn to be about 3.6 times more likely to be food secure than those with more dependent. This assertion is supported by Population Action International (PAI, 2011) which found a positive correlation between food insecurity and fertility rate. PAI found that most of the countries with the highest numbers of people facing food insecurity also have high fertility rates and rapid population growth. Etim (2010) also found that dependency ratio increases the probability of households being poor which invariably reduces their food security status. This claim is also supported by Orewa and Iyanbe (2010).

The odds ratio indicates that those with higher level of formal education, such as tertiary level, are about 22 times more likely to be food secure than those with lower levels of formal education or no formal education at all. Education is very important in order to gain more knowledge in one's particular field of study. Bashir, Naeem and Niazi, (2010) found using categorical variables that graduation level of education increases the odds of a household to become food secure by 21 times compared to having no education. Other studies have also pointed out the positive effect of higher education on decreasing chances of household food insecurity (i.e. improving chances of food security) by 0.408 times (59%) in Nigeria (Amaza ,Umeh, & Adejobi, 2006) and 0.712 times (29%)

in the USA (Kaiser, Quiñonez, Townsend, Nicholson, Fujii, Martin & Lamp, 2003).

Those who own vessels turn to be about 2 times more likely to be food secure than those without their own vessels. This is no surprise because it is general knowledge that employers tend to have more money than employees. Food security status of an individual or household has a strong relationship with the financial standings or income level of the individual or household. That is why the definition of food security (income approach) captures economic access to food, which means the individual should have money to spend on food.

The older fishermen are 1.3 times more likely to be food secure than the younger fishermen. This is because older people have better access to social and economic facility in the society to build their financial status which translates, again, to more money to buy food.

Those with more experience in fishing are 1.2 times more likely to be food secure than those with less experience. All other things being equal, individuals who have worked longer have saved more money. This money can be used to counter any shocks that may result in food insecurity better than individual that have worked for only a short while. Fishermen who use ALI vessels are about 1.7 times more likely to be food secure than those involved in DGN vessels.

Average income of fishermen coupled with education was the biggest predictor of household food security status. The odds ratio revealed that, higher income earners are 32.3 times more likely to be food secure than low income earners. The coefficient of this variable is positively significant implying a positive relationship between food security and monthly income. According to Bashir, Steven and Pandit (2012) study in India , an increase of Rs 1000 in

monthly income of a household increases the chances of food security by 1.105 times or by 10.5 percent. Earlier, Bashir *et al.* (2012) found that an increase of Rs. 1000 increases the chances of rural households to become food secure by 5 percent. Similarly, using categorical variables, Bashir, Naeem, and Niazi (2010) also found a positive impact of income on food security. They found that the households belonging to the income group of Rs 5001–10000, had 15 times more chances of achieving food security compared to the households who belonged to the income group of Rs 0-5000 ($0 – 55). India, Sindhu *et al.* (2008) using the same analytical technique for India, found that the chances of food security increases by 30 percent with an increase of 1000 Indian Rupees in monthly incomes. In a different context, Onianwa and Wheelock (2006) found that chances of a household to become food secure increases by 5 percent with an increase of households' annual income by $1000 for a family without children in the USA. Because Age, Marital status, Number of dependent, Years of experience, and Educational level are significant predictors of household food security, the null hypothesis is rejected.

Effects of the programme

To assess the effect of the programme on fishing households, it was proposed that the ICFG programme had significant effect on the food security status of the households and an enquiry made to find out if it's true. The results of the analysis are shown below in Table 9.

Table 9
Table Showing Results Of Pair Sample T-Test

Variable	T	Df	Sig. (2-tailed)
After and Before	2.87	139	0.005
With and without	5.11	139	0.000

Source=field data n=140

The household food security status before and the programme was compared to their food security after the programme. A t-value of 2.87 and a significance value of 0.005 were obtained. The deduction from this is that only a small fraction of the observed effect can be attributed to chance. This means that there was a significant difference between the food security status of the households before the programme and their food security status after the programme. It is therefore safe to infer that the ICFG programme had a significant effect on the beneficiary thereby translating into an improved food security status.

However, to be more certain that the effect seen is not as a result of some confounding variable a further test was done. A control group with similar characteristics as the experiment group was taken and compared. A paired sample t-test was done between the experiment and the control to find if there is a difference in the status. The result showed a t value of 5.11 with a significant value of 0.000. These values suggest that the probability that the observed difference happened by chance is minute. All put together, we arrive at a conclusion that the observed improvement in food security status of the households in Shama is as a result of the ICFG programme.

Even though the programme had a positive effect on the level of food security in Shama, many still remain food insecure. This is probably due the

definition of food security which says that individual must have physical and economic access to food at all times. Since there still a few days in the years where they do not have food at all times, they are still considered food insecure.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter summarises the study, draws conclusions and presents recommendations for policy making. The study also suggests areas for further studies.

Summary of findings

The study sought to achieve the following objectives:

1. Description of the Integrated Coastal Fisheries Governance programme
2. To ascertain the food security status of fishing household in Shama fishing community
3. To ascertain the determinants of food security status of households in Shama district.
4. To determine the effect of the ICFG programme on the food security status of fishing households in Shama District.

The summary of the major findings are presented with respect to the objectives of the study; which were as follows:

1. Description of the Integrated Coastal Governance Programme

The Integrated Coastal Fisheries Governance (ICFG), locally referred to as Hen Puano, is a multi-stage four year programme supported by the US Agency for international development (USAID). The programme started from September 15, 2009 to September 14, 2013 with a funding of US$12.5 million in USAID funds. The programme was structured into three phases. The first phase ended in September 2010 and focused on consultation, information synthesis and the preparation of a baseline that documents trends, current conditions and issues as the concern integrated coastal zone management (ICM). The second phase started

in October 2010 and concluded in September 2012. It was devoted to specifying goals for improving coastal and fisheries governance in the coastal district of the western region. The third phase built upon this experiences to articulate a viable model for coastal and fisheries governance. The study also discovered that the programme was broadly divided into five components.

The first component was the Population, Health and environment (PHE) which focused on Shama and Ellembelle districts with supports from a sister from Coastal Resource Centre called Building Actors for livelihood and Advancing Communities Excellence in Development (BALANCED). The second component was the Cape Three Point Forest Conservation. The programme involved series of activities aimed at conservation and sustainable use of the cape three point forest reserve and adjoining wetlands. The third component was the Amanzule wetland conservation. These were a series of activities all aimed at conservation of the Amanzule wetlands. The fourth component was the Fisheries Governance which involved a series of activities aimed at strengthening fisheries governance in the western region. The activities include but not limited to strengthening of the Ghana National Canoe Fishermen's Council (GNCFC) of the western region, establishment of the Fisheries Working Group (FWG), strengthening of the fisheries prosecuting chain by training marine police and selected Judges in western region, target leadership training, etc. The last component was the spatial planning which was funded by Tullow Oil and involved the spatial development framework of two districts. The chief beneficiaries were the six coastal districts of western region. The programme stretched from Shama to Jomoro district.

2. **Food security status of Shama fishing households**

The research uncovered that only a small percentage of Shama household were food secure (16.4%) but majority were food insecure with varied degree of severity (83.6). A larger portion of those who are food insecure had a severe case of insecurity whiles only a smaller portion were food insecure but did not experience hunger.

3. **Determinants of the food security levels of Shama fishing household**

Finally, using the odds ratio from a logistic regression, it was discovered that households with married couples were more food secure than households with unmarried couple. Households with fewer dependents tend to be more food secure than those with many dependents. The odds ratio also indicates that those with higher levels of formal education were more food secure. Comparatively, those who own their own vessels were more food secure than those who do not own a vessel just as older fishermen were also more food secure than the younger fishermen. A positive correlation was found between fishing experience of fishermen and food security status of household. Lastly those using ALI vessels were found to be more food secure than those using DGN vessels.

4. **Effect of the ICFG programme of food security level of Shama fishing household**

Also, the study found out that the ICFG programme had positive effects on the food security of Shama fishing household. A Before and After comparison showed that there is a perceived significant improvement in the food security status of the household. This was further confirmed by the comparison group

analysis. That analysis also showed that indeed there has been a large and glaring increase in the food security status of those involved in the programme.

Conclusion of the study

From the findings of the study, the following conclusions are drawn:

1. The ICFG programme was carried out in 6 costal districts of the western region. The programme included education in fishing communities, protection of selected wetlands, conservation of forest reserves and strengthening fisheries prosecuting chain, amongst other things.
2. Majority of the fishing households were food insecure with varied degree of severity.
3. Number of dependent, educational level, fishing experience, number of vessels own, marital status, Age of respondents, type of vessel used, and average income were significant predictors of the food security status of household.
4. The programme had a positive effect on the food security status of Shama fishing households. However, more needs to be done because a lot of the household are still food insecure.

Recommendation of the Study

Based on the conclusion of the study, the following recommendations are made.

1. Government and other NGO's involved in food security improvement in fishing house should increase teaching household head other forms of increasing their income since that improve food security.

2. Government and other NGO's involved in food security improvement should focus more on education of household heads since the research shows that education improves food security.

Suggestions for further Research

1. Further studies should be done on the ICFG to find out its effect on food (in)security of fishing household in other districts which took part of the programme
2. Further studies can be done to find out the effect the programme on Poverty reduction, sustainable fishing management and biodiversity conservation.

REFERENCE

Afram, P. (2011). *An evaluation of the competitive strategies in the Banking industry in Ghana*. *A case study of Barclays Bank of Ghana.* Unpublished master's thesis. Kwame Nkrumah University of Science and Technology. Kumasi, Ghana

Akaba, S. (2006*). Household food security and perceive improvement in livelihood among vegetable farmers in Ketu district of Volta region*, Unpublished master's thesis. University of Cape Coast, Cape Coast, Ghana.

Akaike, H. (1973). Information theory and an extension of the maximum likelihood principle. *Second International Symposium on Information Theory*. Budapest, Academiai Kiado, 267-281.

Alkin, M. C. & Ellett, F.C. (1990). Development of Evaluation Models. *The International Encyclopedia of Educational Evaluation*. London, Pergamon Press, 454

Amaza, P.S., Umeh J.C., Helsen J. & Adejobi A.O. (2006). *Determinants and measurement of food insecurity in Nigeria: some empirical policy guide*. Presented at International Association of Agricultural Economists' annual meeting, August 12-18, 2006. Queensland

Amanfo, O. S. (2011). *Evaluation of the out-programme one year teaching practice of final year students (MENTEES) of St. Joseph's college of education-Bechem*. Unpublished master's thesis. Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Antwi-Boadi, E. (2002*). Evaluation of the final senior secondary school visual art project/practical work: A case study of some schools in Ashanti Region*. Unpublished master's thesis. Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Ayalew, M. (1988). *Famine early warning system*. Paper presented for the National Disaster Prevention and Preparedness Conference, Addis Ababa, Ethiopia, 23rd September, 1988.

Babatunde R.O., Omotosho, O.A. & Sholotan O.S. (2007). Socio-economic characteristics and food security status of farming households in Kwara State, North-Central, Nigeria. *Pakistan Journal of Nutrition 6*(1), 49-58.

Barrett, C. B. (2010). Measuring food insecurity. *Science 327 (5967)*, 825–828.

Barbazette, J. (2006). What is needs assessment? Retrieved from January 1, 2012, from http://media.wiley.com/ product_data/excerpt/57/07879752/ 0787975257.pdf

Bashir, M.K.; Naeem, M.K.; & Niazi, S.A.K. (2010). Rural and peri-urban food security: a case of district Faisalabad of Pakistan. *WASJ 9*, 403-41.

Bashir M.K.; Steven, S. & Pandit, R. (2012). *The determinants of rural household food security in the Punjab, Pakistan: an econometric analysis*. Working paper 1203, School of Agricultural and Resource Economics, University of Western Australia, Crawley, Australia.

Bishop, C M. (2006). *Pattern Recognition and Machine Learning*. Springer. 206–209.

Banerjee A.; Chaudhury, S.; Singh, D.K; Banerjee, I.; Mahato, A.K.; Haldar, S. (2010). Statistics without tears - inputs for sample size calculations. *Industrial Psychiatry Journal 19*(1), 60–65

Davis, M.A. (2013). *An evaluation of Zoomlion Ghana's participation in solid waste management in Ablekuma central sub- metropolitan area*. Unpublished master's thesis. University Of Ghana. Legon, Ghana

De Long, J.B., Lang, K., (1992). "Are all economic hypotheses false?". *Journal of Political Economy 100*, 1257-1272.

Delbert, C. M., Neil, J. S. (2002). *Handbook of research design & social measurement.* (6th ed). Thousand Oaks, Califonia: SAGE

Ecker & Breisinger (2012). *The food security system.* International food policy research institute. Washington, D.D., pp. 1–14.

Etim, N. A. A. and Patrick, I. V. (2010). Estimating the determinants of poverty among fishing households in Akwaibom State, Nigeria. *Journal of Agriculture and Social Sciences 6*. 61– 63.

Eveland, J.D. (1986). Diffusion, Technology Transfer, and Implementation: Thinking and Talking about Change. *Knowledge-Creation Diffusion Utilization. 8* (2), 303-322.

FAO (1997). *The food system and factors affecting household food security and nutrition.* Agriculture, food and nutrition for Africa: a resource book for teachers of agriculture. Rome, Agriculture and Consumer Protection Department.

FAO, (1996). *Rome declaration on world food security and world food summit plan of action.* Paper presented at the World Food Summit 1996. Rome.

FAO GIEWS (2005). *Food security*. Rome: FAO.

Gilmore, J.W. (1980). *Morocco: food aid and nutrition education.* AID project impact evaluation report no. USAID,

Glazerman, S., Levy, D. M. & David Myers. 2003. Nonexperimental versus experimental estimates of earnings impacts. *Annals of the American Academy of Political and Social Science 589*(1), 63-93.

Gordon, G.M. (1972). *An evaluation of nutritional education given to pregnant and nursing women in six communities in the Upper regions of Ghana*. Unpublished master's thesis. University of Ghana, Legon, Ghana.

Gorimani, E. T., David, H. H.,(1999). Women, Infants, and Children Program participants in rural Appalachia may be prone to food insecurity: A pilot study. *Journal of The American Dietetic Association*, *99*(25), 17.

Gregory, P. J., Ingram, J. S., & Brklacich, M., (2005). Climate change and food security. *Philosophical Transactions of the Royal Society B: Biological Sciences 360* (1463), 2139-2148

Gueri, M., Jutsum, P. & White, A. (1978). Evaluation of a breatfeeding compaign in trinidad. *Bulleting of Pan American Health Organisation, 12* (2), 112-115.

Hailu, A. & Regassa, N. (2007): *Correlates of Household Food Security in Densely Populated Areasof Southern Ethiopia: Does the Household*

Structure Matter? Department of Rural Development and Family Sciences, Hawassa University, Ethiopia.

Hopewell (2009). Publication bias in clinical trials due to statistical significance or direction of trial results. *Cochrane Database of Systematic Reviews 2009*, Issue 1.

Kaloi E., B. Tayebwa and B. Bashaasha (2005). *Assessing the Food Security Status of Households in Mwingi District – Kenya*. Proceedings of the 7th African Crop Science Society Conference 2005.

Klinterberg, R., (1977). *Management of Disaster Victims and Rehabilitation of Uprooted Communities*. Ethiopia, Relief and Rehabilitation Commission, Addis Ababa, Ethiopia, Mime.

Kaiser, L.L., Quiñonez, H. M., Townsend, Y., Nicholson, M.L. Fujii, A.C. & C.L. Lamp (2003). Food insecurity and food supplies in Latino households with young children. *Journal of Nutrition Education and Behaviour 35*, 148-153.

Kyaw, D. (2009). *Rural Households' Food Security and Coping Strategies to Food Insecurity in Myanmar*. Institute of Developing Economies, Japan External Trade Organization. Research Forum Series No.444, pp.78.

Loring, P. A., & Craig, S. G. (2009) Food, Culture, and Human Health in Alaska: An Integrative Health Approach to Food security. *Environmental Science and Policy 12* (4), 466–478.

Tweeten, Luther (1999). "The Economics of Global Food Security". *Review of Agricultural Economics*. *21* (2), 473–488

Mouton, J. (2009). Assessing the impact of complex social interventions. *Journal of public administration 44* (4.2), 849-865

Mengistu, E., Regassa N. & Yusufe, A. (2009). *The levels, determinants and coping mechanisms of food insecure households in Southern Ethiopia: case study of Sidama, Wolaita and Guraghe Zones*. Drylands Conservation Group Report No. 55, the Drylands Coordination Group.

Marthe, Sylvain, & Stephanie. (2009). How Legitimate and Justified are Judgments in Program Evaluation*? Evaluation*. *15 (3),* 307–319.

Negash, M. (2000). *Environment Depletion as a Way out to Seasonal Food Insecurity - the case of North Wello, Ethiopia*. A paper presented on the First Rural and Local Development Studies International Policy Research Workshop, April 14 - 15, 2000. Addis Ababa,

Onianwa, O.O. & Wheelock G.C. (2006). An analysis of the determinants of food insecurity with severe hunger in selected southern states. *Southern Rural Sociology 21*, 80-96.

Orewa, S. I. and Iyanbe, C. O. (2010). Determinants of daily food calorie intake among rural and low-income urban households in Nigeria. *Academic Journal Plant Science 3*(4), 147-155.

Patel, J. (2013). *Food sovereignty is next big idea*. Financial Times. Retrieved Jan 17, 2014, from http://www.ft.com/cms/s/0/584ed992-4216-11e3-9d3c-00144feabdc0.html

Peikes, D. N., Lorenzo, M., & Sean M. O. (2008). Propensity score matching. *American Statistician 62*(3), 222-231.

Perez-Escamilla, Rafael., Segall-Correa, & Ana, M. (2008). Food insecurity measurement and indicators. *Revista de Nutrição 21*, 15–26

Population Action International (2011). *Why population matters in food security.* Washington, DC: Population Action International.

Przeworski, A. & Teune, H. (1970). *The Logic of Comparative Social Inquiry*. New York: Wiley

Prissie (2008). *An evaluation of the processes and outcomes of the IPTp programme using SP for Malaria control in pregnancy*. Unpublished master's thesis. Kwame Nkrumah University of Science and Technology, Ghana

Queensland Health (2006). *Urban indigenous nutrition issues in the greater Brisbane area.* Central Area Population Health Services, Queensland

Reeve, J; & Paperboy, D. (2007). Evaluating the evaluation: Understanding the utility and limitations of evaluation as a tool for organizational learning. *Health Education Journal 66* (2). 120–131.

Rossi, P.H., Ellipse, M.W., & Freeman, H.E. (2004). *Evaluation: A systematic approach* (7 ed). Thousand Oaks, Califonia: SAGE.

Rouda, R. H., & Kusy, M. E. (1995). *Needs assessment: The first step*. Retrieved 23 June 2015, from http://alumnus.caltech.edu/~rouda/T2_NA.html

Rychetnick, L., Webb, K., Story, L, & Katz, T (2003), *Food (in)security Options Paper – A planning framework and menu of options for policy and practice intervention,* New South Wales Centre for Public Health Nutrition, Sidney, Australia.

Sarah D. T. (2002). What is evaluation? . *Evaluation Trust*. . Retrieved 13 May,2012, from http//www.evaluationtrust.org/evaluation/evaluate

Shadish, W. R., Cook, T. D., & Leviton, L. C. (1991). *Foundations of program evaluation: Theories of practice*. Newbury Park, Califonia: SAGE

Shama District Assembly, undated. Shama District Assembly profile – Draft. 15

Sikwela,M. M (2008): *Determinants of Household Food security in the semi-arid areas of Zimbabwe: A case study of irrigation and non-irrigation farmers in Lupane and Hwange Districts*. Unpublished master's thesis. University of Fort Hare, South Africa.

Sindhu, R.S., Kaur, I. & Vatta, K. (2008). Food and nutritional insecurity and its determinants in food surplus areas: the case study of Punjab state. *Agricultural Economics Research Review 21*, 91-98.

Small Holder Farmers Coping Strategies to household food insecurity and hunger in Nigatu Regassa, Southern Ethiopia, *Ethiopian Journal Environmental Studies and Management 4*(1), 76.

Staff (2011). Evaluation Purpose. *Designshop – lessons in effective teaching*. Learning Technologies at VirginiaTech. Retrieved 13 May, 2012, from http//www.edtech.vt.edu.

Staff (2012). "What Is Evaluation?". *International Center for Alcohol Policies - Analysis. Balance. Partnership*. Retrieved May 13, 2012, from http//www.icap.org.

Swindale, A; Bilinsky, P. (2006). Development of a universally applicable household food insecurity measurement tool: process, current status, and outstanding issues. *The Journal of Nutrition 136* (5), 1449–1452.

Tineke Martens (2007). *Impact of the Ghana school feeding program in 4 districts in Central Region, Ghana*. Unpublished master's thesis. Wagennigen University, Netherlands.

Tollosa, D. (1996). *Belg Crop Production as a Strategy of Households' Food Security: A Comparative Study of Belg Grower and Non-Belg Farmers in Munessa Woreda, Arsi Zone*. Master's Thesis submitted to Addis Ababa University. Ethiopia

Tufo (2002). "What is evaluation?". *Evaluation Trust*. The Evaluation Trust. Retrieved May 13, 2012 from http//www.theevaluationtrust.com

United Nations (1999). *The right to adequate food*. Committee on Economic, Social, and Cultural Rights, Geneva, United Nations.

Webb, P., Coates, J., Frongillo, E. A., Rogers, B. L., Swindale, A., & Bilinsky, P. (2006). Measuring household food insecurity: why it's so important and yet so difficult to do. *The Journal of Nutrition 136* (5), 1404–1408.

Wilhemina Quaye (2008). Food security situation in northern Ghana, coping strategies and related constraints. *African Journal of Agricultural Research 3* (5), 334-342.

Wolde-Mariam, M., (1984). *Rural Vulnerability to Famine in Ethiopia 1958-1977*. Addis Ababa, Ethiopia: Relief and Rehabilitation Centre.

World Food Programme, WFP, (2009). *Comprehensive Food Security and Vulnerability Analysis. Accra, Ghana*. Pp. 168. Retrieved from http: //www.fao.org

World Food Summit (1996). *Rome Declaration on World Food Security*. Rome. Italy

Yamane, T. (1967). *Statistics: an introductory analysis (2nd ed).* New York: Harper and Row.

Zakaria, Jalil (2011). *An evaluation of NGO-Led development Interventions and their Sustainable Management in the Savelugu-Nantong District*. Unpublished master's thesis. Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

APPENDIX A

UNIVERSITY OF CAPE COAST

SCHOOL OF AGRICULTURE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

Introduction: This interview schedule is purely for academic purposes and all information given will be treated as such and responses given by you would be treated as confidential. Therefore, be sincere in answering questions, expressing your opinion and suggestions as much as possible as your participation in this study is completely solicited. Once again, your anonymity is greatly assured.

STRUCTURED INTERVIEW FOR FISHERMEN IN SHAMA DISTRICT

In all cases where answer options are available, please tick the appropriate option.

1. Age of household head respondent

a. below 20 b. 20-30 c. 31-40 d. 41-50 e. 51-60 f. above 60

2. Are you household head a. Yes b. No

3. Occupation of respondent……

4. Number of year involved in occupation …….

5. Marital status of respondent

a. Single b. Married

6. Number of dependents in respondent's household …….....

7. Highest educational level of respondent

a. No formal education b. Primary c. Middle School/JSS d. Secondary

e. Tertiary

8. What is your monthly income.....?
9. How many streams of income do you

   have……

10. Do you own a vessel a. No b. Yes
11. If yes to Q10, how many.....
12. Access to financial services

    a. Yes b. No

GENERAL FOOD SUFFICIENCY QUESTION/SCREENER: Question 1, 1a, 1b (OPTIONAL: these questions

1. Which of these statements best describes the food eaten in your household in the last 12 months

a. we always have enough to eat and the kinds of food we want

b. we have enough to eat but not always the kinds of food we want;

c. sometimes we don't have enough to eat; or

d. Often we don't have enough to eat?

1. *(IF SOMETIMES OR OFTEN NOT ENOUGH TO EAT)* Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why you don't always have enough to eat.

a. Not enough money for food

b. Too hard to get to the store

c. On a diet

d. No working stove available

e. Not able to cook or eat because of health problems

2. *(IF ENOUGH FOOD, BUT NOT THE KINDS WE WANT)* Here are some reasons why people don't always have the kinds of food they want or need. For each one, please tell me if that is a reason why you don't always have the kinds of food you want or need.

a. Not enough money for food

b. Too hard to get to the store

c. On a diet

d. Kinds of food we want not available

e. Good quality food not available

BEFORE THE ICFG PROGRAMME

3. "I ***worried whether our food would run out*** before we got money to buy more." Was that

a. often,

b. sometimes,

c. Never true for you in the last 12 months?

4. The ***food that we bought just didn't last***, and we didn't have money to get more." Was that

a. often,

b. sometimes,

c. Never true for you in the last 12 months?

5. ***We relied on only a few kinds of low-cost food to feed the children*** because we were running out of money to buy food." Was that

a. often,

b. sometimes, or

c. never true for you in the last 12 months

6. We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that

a. often,

b. sometimes, or

c. never true for you in the last 12 months

7. We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that

a. often,

b. sometimes, or

c. Never true for you in the last 12 months?

8. The ***children were not eating enough*** because we just couldn't afford enough food." Was that

a. often,

b. sometimes, or

c. Never true for you in the last 12 months?

9. In the last 12 months, did ***you or other adults*** in your household ever ***cut the size of your meals or skip meals*** because there wasn't enough money for food?

How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months?

10. In the last 12 months, did you ever ***eat less than you felt you should*** because there wasn't enough money to buy food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

11. In the last 12 months, were you ever ***hungry but didn't eat*** because you couldn't afford enough food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

12. Sometimes people lose weight because they don't have enough to eat. In the last 12 months, did you ***lose weight*** because there wasn't enough food?

    How often did this happen--

a. almost every month,

b. some months but not every month, or

c. in only one or two months

13. In the last 12 months, did ***you or other adults*** in your household ever ***not eat for a whole day*** because there wasn't enough money for food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

14. In the last 12 months, did you ever ***cut the size of any of the children's meals*** because there wasn't enough money for food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

15. In the last 12 months, did any of the ***children ever skip meals*** because there wasn't enough money for food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

16. In the last 12 months, were the ***children ever hungry*** but you just couldn't afford more food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

17. In the last 12 months, did any of the ***children ever not eat for a whole day*** because there wasn't enough money for food?

    How often did this happen —

a. almost every month,

b. some months but not every month, or

c. in only one or two months

AFTER THE ICFG PROGRAMME

18. "I ***worried whether our food would run out*** before we got money to buy more." Was that

d. often,

e. sometimes,

f. Never true for you in the last 12 months?

19. The ***food that we bought just didn't last***, and we didn't have money to get more." Was that

d. often,

e. sometimes,

f. Never true for you in the last 12 months?

20. ***We relied on only a few kinds of low-cost food to feed the children*** because we were running out of money to buy food." Was that

d. often,

e. sometimes, or

f. never true for you in the last 12 months

21. We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that

d. often,

e. sometimes, or

f. never true for you in the last 12 months

22. We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that

d. often,

e. sometimes, or

f. Never true for you in the last 12 months?

23. The ***children were not eating enough*** because we just couldn't afford enough food." Was that

d. often,

e. sometimes, or

f. Never true for you in the last 12 months?

24. In the last 12 months, did ***you or other adults*** in your household ever ***cut the size of your meals or skip meals*** because there wasn't enough money for food? How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months?

25. In the last 12 months, did you ever ***eat less than you felt you should*** because there wasn't enough money to buy food? How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

26. In the last 12 months, were you ever ***hungry but didn't eat*** because you couldn't afford enough food?

    How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

27. Sometimes people lose weight because they don't have enough to eat. In the last 12 months, did you ***lose weight*** because there wasn't enough food?

    How often did this happen--

d. almost every month,

e. some months but not every month, or

f. in only one or two months

28. In the last 12 months, did ***you or other adults*** in your household ever ***not eat for a whole day*** because there wasn't enough money for food?

    How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

29. In the last 12 months, did you ever ***cut the size of any of the children's meals*** because there wasn't enough money for food?

    How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

30. In the last 12 months, did any of the ***children ever skip meals*** because there wasn't enough money for food?

    How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

31. In the last 12 months, were the ***children ever hungry*** but you just couldn't afford more food?

    How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

32. In the last 12 months, did any of the ***children ever not eat for a whole day*** because there wasn't enough money for food?

    How often did this happen —

d. almost every month,

e. some months but not every month, or

f. in only one or two months

APPENDIX B

UNIVERSITY OF CAPE COAST

SCHOOL OF AGRICULTURE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

Introduction: This interview schedule is purely for academic purposes and all information given will be treated as such and responses given by you would be treated as confidential. Therefore, be sincere in answering questions, expressing your opinion and suggestions as much as possible as your participation in this study is completely solicited. Once again, your anonymity is greatly assured.

STRUCTURED INTERVIEW FOR FISHERMEN IN SHAMA DISTRICT

In all cases where answer options are available, please tick the appropriate option.

1. Age of household head respondent

a. below 20 b. 20-30 c. 31-40 d. 41-50 e. 51-60 f. above 60

2. Are you household head a. Yes b. No

3. Occupation of respondent……

4. Number of year involved in occupation……

5. Marital status of respondent

a. Single b. Married

6. Number of dependents in respondent's household …….....

7. Highest educational level of respondent

a. No formal education b. Primary c. Middle School/JSS d. Secondary

e. Tertiary

8. Access to financial services

a. Yes b. No

2. What is your monthly income?.....

3. How many streams of income to you have……

4. Do your own a vessel a. No b. Yes

5. If yes to Q10, how many.....

GENERAL FOOD SUFFICIENCY QUESTION/SCREENER: Question 1, 1a, 1b (OPTIONAL)

6. Which of these statements best describes the food eaten in your household in the last 12 months

e. we always have enough to eat and the kinds of food we want

f. we have enough to eat but not always the kinds of food we want;

g. sometimes we don't have enough to eat; or

h. Often we don't have enough to eat?

7. *(IF SOMETIMES OR OFTEN NOT ENOUGH TO EAT)* Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why you don't always have enough to eat.

f. Not enough money for food

g. Too hard to get to the store

h. On a diet

i. No working stove available

j. Not able to cook or eat because of health problems

8. *(IF ENOUGH FOOD, BUT NOT THE KINDS WE WANT)* Here are some reasons why people don't always have the kinds of food they want or need. For each one, please tell me if that is a reason why you don't always have the kinds of food you want or need.

f. Not enough money for food

g. Too hard to get to the store

h. On a diet

i. Kinds of food we want not available

j. Good quality food not available

9. "I ***worried whether our food would run out*** before we got money to buy more." Was that

g. often,

h. sometimes,

i. Never true for you in the last 12 months?

10. The ***food that we bought just didn't last***, and we didn't have money to get more." Was that

g. often,

h. sometimes,

i. Never true for you in the last 12 months?

11. ***We relied on only a few kinds of low-cost food to feed the children*** because we were running out of money to buy food." Was that

g. often,

h. sometimes, or

i. never true for you in the last 12 months

12. We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that

g. often,

h. sometimes, or

i. never true for you in the last 12 months

13. We ***couldn't feed the children a balanced meal*** because we couldn't afford that." Was that

g. often,

h. sometimes, or

i. Never true for you in the last 12 months?

14. The ***children were not eating enough*** because we just couldn't afford enough food." Was that

g. often,

h. sometimes, or

i. Never true for you in the last 12 months?

15. In the last 12 months, did ***you or other adults*** in your household ever ***cut the size of your meals or skip meals*** because there wasn't enough money for food? How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months?

16. In the last 12 months, did you ever ***eat less than you felt you should*** because there wasn't enough money to buy food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months

17. In the last 12 months, were you ever ***hungry but didn't eat*** because you couldn't afford enough food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months

18. Sometimes people lose weight because they don't have enough to eat. In the last 12 months, did you ***lose weight*** because there wasn't enough food?

How often did this happen--

g. almost every month,

h. some months but not every month, or

i. in only one or two months

19. In the last 12 months, did ***you or other adults*** in your household ever ***not eat for a whole day*** because there wasn't enough money for food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months

20. In the last 12 months, did you ever ***cut the size of any of the children's meals*** because there wasn't enough money for food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months

21. In the last 12 months, did any of the ***children ever skip meals*** because there wasn't enough money for food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months

22. In the last 12 months, were the ***children ever hungry*** but you just couldn't afford more food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months

23. In the last 12 months, did any of the ***children ever not eat for a whole day*** because there wasn't enough money for food?

How often did this happen —

g. almost every month,

h. some months but not every month, or

i. in only one or two months