

**FOOD SECURITY, FORESTRY AND REDD+ BENEFIT
DISTRIBUTION IN GHANA**

by

Leigh Patrick Fox

B.A., The University of British Columbia, 2008

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Abstract

Do international Sustainable Forest Management (SFM) institutions, such as the Reducing Emissions from Deforestation and Forest Degradation (REDD+) under the United Nations Framework Convention on Climate Change (UNFCCC), incorporate equal access to benefit as part of their programs in Ghana? This paper investigates the development of REDD+ strategies and project proposals in Ghana and looks specifically at what influence the creation of a new forest commodity could have on food insecurity in the country. Focusing on the access dimension of food security, a central question will be addressed: Are REDD+ Emissions Reduction Purchase Agreements (ERPAs) advantageous or disadvantageous to food insecure people wishing to strategically access forestry opportunities to reduce hunger and food insecurity? Critical to answering this question is an understanding of potential benefit available in REDD+ transactions in Ghana: who gets what, when, and how is benefit transferred.

REDD+ ERPAs monetize forest carbon, Emission Reductions (ERs), gained through forest conservation and management activities. REDD+ is a market-based mechanism because it seeks to use market forces, the buying and selling of goods and services, to incentivize a conservation behaviour with respect to forest management. By commodifying and trading avoided deforestation and afforestation as a product and service, market actors institutionalize transaction types, roles, responsibilities and access characteristics of the marketplace. As a set of rules, REDD+ programs and protocols claim social and economic benefit is delivered to marginalized, often food-insecure, groups of people as stakeholders through contractual activities. At the same time as REDD+ projects are being planned and implemented in Ghana, the Food and Agriculture Organization of the United Nations (FAO) reports that there are

presently no good indicators of social benefit in forestry. Looking closely at food security literature this paper highlights both opportunities and potential barriers being institutionalized by REDD+ programs. Carbon tenure rights and benefit sharing plans for REDD+ generated revenue will be discussed as well as the social and environmental safeguards mandatory under contractual regimes. Recommendations will focus on how to quantify social benefit from forestry and utilize knowledge created in the field of food and nutrition security more effectively in a cross-disciplinary manner.

Lay Summary

Africa has struggled with food insecurity and famine for decades. Of the estimated 800 million people in the world that suffer from extreme hunger globally, 220 million live in Africa. Many more are considered food insecure by a standard that includes having enough food to eat, access to appropriate food choices, a diverse diet and security of food choice options. International forestry is being promoted as one option to reduce food insecurity in African countries like Ghana.

One such forestry mechanism called REDD+ aims to reduce deforestation and forest degradation by paying countries like Ghana to preserve their forests. With forests in Ghana often being recognized as a public good, the management of a program to pay for the conservation activity is a complex exercise. This paper looks at REDD+ in Ghana and how benefit from the payment for this environmental service is distributed to many different levels of society.

Preface

This dissertation is original, unpublished, independent work by the author, L.P. Fox.

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List of Abbreviations

BSP	Benefit Sharing Plan
CIF	Climate Investment Fund
COP	Conference of the Parties
CSO	Civil Society Organization
DF	Dedicated Fund
EC	European Community
ERs	Emission Reductions
ERP	Emission Reduction Program
ERPA	Emission Reduction Purchase Agreement
ER-PD	Emission Reduction Program Document
FAD	Food Availability Decline
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FDI	Foreign Direct Investment
FLEGT	Forest Law Enforcement Governance and Trade
FNS	Food and Nutrition Security
GCFRP	Ghana Cocoa Forest REDD+ Programme
GDP	Gross Domestic Product
HFZ	High Forest Zone
HFIAS	Household Food Insecurity Access Scale
INDC	Intended Nationally Determined Contribution
ITTO	International Tropical Timber Organization
IUFRO	International Union of Forest Research Organizations
LOC	Letter of Credit
LOI	Letter of Intent
MDGs	Millennium Development Goals
PoU	Prevalence of Undernourishment Indicator
PwC	Pricewaterhouse Coopers
REDD+	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, plus forest carbon stock enhancement
R-RP	Readiness Preparation Proposal
SDGs	Sustainable Development Goals
SFM	Sustainable Forest Management
SP	Salvage Permit
TUC	Timber Utilization Contract
TUP	Timber Utilization Permit
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
VPA	Voluntary Partnership Agreement
WFP	World Food Program
WFS	World Food Summit

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Dedication

“A good horse overcomes adversity. A good horse is a good horse anywhere”.

(Captain Ron Burrell, MV Shameless, 2015)

Chapter 1: Introduction

1.1 Food Insecurity as a Global Problem

Food insecurity is a critical challenge facing humanity today. More than a billion people worldwide can not acquire enough quality food to eat daily, or over a sustained period (FAO, 2015). The Food and Agriculture Organization of the United Nations (FAO) reports that 800 million people worldwide are chronically undernourished. In sub-Saharan Africa there are 220 million undernourished people representing 23.2 percent of the region's population. Between 1990 and 2015 the total number of undernourished people in Africa rose 25 percent, despite multilateral hunger reduction initiatives designed to cut this number in half over the same period. There are countries in the region that have recorded 100 percent increases in the number of undernourished people between 1990 and 2015 (FAO, 2015). A key take-away from these numbers is that hunger, undernourishment and food insecurity in Africa has worsened over the past 15 years despite sustained global efforts to eliminate these problems.

Food security, however, is not simply the absence of hunger. As described in the Rome Declaration of the 1996 World Food Summit (WFS), Food Security is:

a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 1996, p. 2).

This distinction is important when considering statistical information about undernourishment and hunger reduction vis a vis the concept of full food security.

1.2 The Relationship Between Forests and Food Security

The reduction of food insecurity is deeply embedded in the desire to utilize forestry, and forest policy, to positively impact the lives of people at the margin of survival (Sunderland, et al., 2013; FAO, 2014). A recent report from the International Union of Forest Research Organizations (IUFRO) identifies direct and indirect contributions that forests and forest ecosystems provide to food security and nutrition (Vira et al., 2015). Direct benefits include food sourced within and around forests on a regular basis and in times of food scarcity as well as fuel wood used for cooking and water sanitation. Forests also contribute indirectly by creating and supporting income generating and livelihood opportunities that in turn can foster greater food and nutrition security (Vira et al., 2015). In addition, tree based agroforestry, intercropping fruits and vegetables inside forests and in tree plantations, contributes to alleviate food supply and diet diversity challenges in developing countries (Corona et al., 2016). Another important feature of this relationship are ecosystem services provided by forests and the balance between deforestation for agricultural expansion and the benefits, such as cleaner water and air, provided at a landscape scale by forests and tree-based systems (Vira et al., 2015). Many national and sub-national jurisdictions must reconcile the desire to preserve forests with the need to produce food for growing populations. Socioeconomic benefits, inclusive of food security considerations, are often identified as central tenets in the design and implementation of international institutions working on forest governance and policy in Africa (EU-FLEGT, 2015b; UN-REDD, 2015). Defining what constitutes social benefit from forests and forestry is a persistent challenge in the literature to date (Harshaw et al., 2007; FAO, 2014).

1.3 Forestry and the Access Dimension of Food Security

Access to food resources and income generating opportunities as a dimension of food security is an important point of connection between forestry, livelihoods and food security. The problem of persistent food insecurity in developing countries and the link between forestry and food insecurity can be examined from a forestry perspective. The nature of this relationship is changing as new forestry based institutions such as REDD+ are implemented from the multinational to the local levels. REDD+ programs and activities modify the present forest value chain by incentivizing behaviour and management strategies that avoid deforestation and promote carbon stock enhancement. Adding carbon as a managed and marketed commodity alters the forest resource access options for firms and individuals in the country of program activity. In some situations, managing for carbon and avoided deforestation may reduce access to forest land and resources and in other cases it may increase access to forestry or other resources for stakeholders. This could include cash payments for prescribed management behaviour, access to programs that are connected to REDD+ activities or recognition of land tenure or access rights for people living in and around forest land. The subject of access to benefit under REDD+ is critical in the design phase of programs like REDD+ as it will inform the question of who gets what benefit, when they get benefit and the pathways through which benefit is transferred. From a food security perspective access to REDD+ benefit speaks to the total resources available for that stakeholders may convert to food as defined by the access dimension of food security. At international levels of governance, an understanding of the REDD+ 'readiness' requirements and legal implications for engaging in a multilateral production and purchase agreement in the Ghanaian context is important. Specific plans and projects are also critical because they will

elucidate details of stakeholder engagement, direct and indirect benefit, and benefit distribution. Ghana has submitted the final draft of the country's Emission Reduction Program Document (ER-PD) to the Forest Carbon Partnership Facility though the benefit sharing plan has yet to be published in its final form. The first nationally led program in Ghana working towards the production and sale of standardized emission reduction units is the Ghana Cocoa-Forest REDD+ Programme. A look at this proposal and development process will inform the present discussion of likely outcomes from activities, impacts on Food and Nutrition Security, benefits and distribution mechanisms.

1.4 Ghana as a Case Study for REDD+ in Developing Countries

Ghana is a good case study for the development of REDD+ systems in a developing country because there was early adoption and engagement between the national and multinational levels on REDD+ activities, there are existing market based mechanisms (FLEGT-VPA) in operation in Ghana and there are robust community based activities in forestry. Both international programs prescribe a standard of stakeholder engagement and performance standards in their respective fields. The REDD+ process in Ghana has leveraged work done in the VPA framework as evidence of good forest governance and sustainable forest management. Implicit in many claims of social benefit is the idea that this new direction of forest governance will decrease deforestation, forest degradation and livelihood insecurity for stakeholders. Determining who gets what type of benefit and whether this benefit is advantageous to poor stakeholders is an important exercise. Looking specifically at how forest benefit is distributed in Ghana and what types of benefit are likely to be distributed to different stakeholders under a REDD+ framework will contribute to understanding how REDD+ could reduce food insecurity.

Understanding forestry from a food security perspective, utilizing cross disciplinary indicators, could give researchers and policymakers additional tools to measure the effectiveness of this approach to environmental service markets.

Chapter 2: Food and Nutrition Security: A Multidimensional Issue

2.1 Global Food and Nutrition Security

The 1996 definition of Food and Nutrition Security (FNS), used in most scholarly work, is robust and inclusive of the four dimensions of food security presented at the World Food Summit in Rome: Availability, Access, Utilization and Security (FAO, 1996). The Rome Declaration also asserted a commitment to halve, by 2015, the number of hungry people in the world as measured by the Prevalence of Undernourishment (PoU) indicator produced by the FAO. This same indicator of caloric intake was used to measure progress towards Millennium Development Goal 1c: “cutting by half the proportion of people who suffer from hunger by 2015”, which has transitioned into Sustainable Development Goal 2, to end global hunger by 2030 (FAO, 2015, p. 4; UN-SDG, 2016b). The most recent FAO *State of Food Insecurity in the World* report characterizes progress towards the MDG goal as “uneven” (FAO, 2015, p. 1). This point is reinforced in a study conducted by Knueppel et al. (2009). Investigating the validity of the Household Food Insecurity Access Scale (HFIAS) in Tanzania, itself an amalgamation of food security indicators, the authors found that only 20 percent of households surveyed were food secure, and, of the insecure households, over 48 percent were categorized as severely food-insecure. By comparison, the FAO reports that the total number of undernourished people in Tanzania has climbed from 6.4 million people to 16.8 million and the prevalence rate has increased to one in three people, or 33 percent of the population. One take-away from this contrast is that there are many more food-insecure people than are captured in the official undernourishment figures.

2.2 History of Food and Nutrition Security: Supply Side Focus

Food insecurity is an issue that the international community has attempted to deal with since the end of the Second World War (UN, 1948). The Universal Declaration of Human Rights, adopted by the United Nations General Assembly in December 1948, enshrined sufficient food and a healthy life as a right afforded to all people. An early current in the literature centered on the need for information and monitoring systems as a response to particularly acute famines in Africa between 1970 and 1990 (Eele, 1994). Researchers and policymakers designed systems to monitor national and global food supply trends as a way of predicting shortfalls that may lead to an increased famine risk. The underlying assumption was that food insecurity and famine are caused by a lack of food availability and that understanding the production and supply side of the equation would lead to more effective aid delivery and increased food security (Sen, 1981). Sub-Saharan Africa is where many of these systems were developed and, according to Bapu and Pinstrup-Anderson (1994), done so without success due to poor understanding of FNS principles and limited capacity to interpret and utilize the information collected.

Monitoring and surveillance was the response of the day for the international community and the 1974 World Food Conference was a catalyst for many donor and developing countries to partner and establish national level monitoring systems (Eele, 1994). Reviewing the systems that were implemented between the 1974 Conference and the early nineties, some authors note that many responses to famine and insecurity started with data collection before looking at where data were required or how they might be utilized to reduce insecurity (Bapu & Pinstrup-Anderson, 1994). Eele made the observation that investment in monitoring systems and

sophisticated indicators and indices to measure insecurity “may well have been pursued to indicate that something was being done, when more fundamental changes were politically difficult” (Eele, 1994, p. 315).

2.3 Dimensions of Food and Nutrition Security

Availability, access, utilization and stability, or security, are the four commonly accepted dimensions of Food Security in published work on the subject (Laborde et al., 2013; Maxwell et al., 2014; FAO, 2015). Availability of food resources at a national level, measured through annually constructed Food Balance Sheets, was the center of analysis and action for decades before Amartya Sen and others started looking critically at other dimensions and how they interact with food insecurity (Devereux, 2001). Access, or entitlement, is the dimension relating to a person's ability to use their assets and abilities to acquire food (Sen, 1981). Access may be denied because of a fiscal deficit, a geographic issue, a socio-political circumstance or a host of other possibilities that reduce individual or household ability to acquire the necessary resources for food security (Devereux, 2001). Utilization relates to the quality and diversity of food that is being consumed and how, at a micronutrient level, calories are being used by the individual. Security is a dimension that applies to each of the other dimensions in terms of the stability of food availability, security of access or entitlements, and consistency in nutrient utilization. The four dimensions of food security cover a wide range of research and practical interests operating at the international, national, regional, household, and individual levels.

2.4 A Paradigm Shift: Entitlement Theory and Access to Food

The principle of supply side intervention as an institutional response to famines and food insecurity was termed Food Availability Decline (FAD) by Amartya Sen in a seminal work titled *Poverty and Famines* (Sen, 1981). The book incited a theoretical shift in understanding of food insecurity and famines with the observation that despite sufficient availability of food, famine conditions developed because certain groups of people did not have access to food resources. The importance of access to food became essential to a new conceptualization of Food and Nutrition Security (FNS), chronic insecurity and food emergencies (Eele, 1994). Entitlement theory is the contribution which asserts that an individual's FNS status is directly related to their ability to convert resources, what Sen terms "commodity bundles", into food (Sen, 1981, p. 45). Food ownership is a property right according to Sen and, in this framework, starvation is the "failure to be entitled to a bundle with enough food" (Sen 1981, p. 45). Maxwell and Frankenberger (1992) describe sources of entitlement in each individual or household's set: Productive Capital; Non-Productive Capital; Human Capital; Income; and Claims. Productive capital includes assets such as land, tools, animals, trees, wells, and buildings, while non-productive capital refers to food stores, some animals, cash savings and possessions such as jewelry that are easily convertible to cash or food. Human capital refers to labour, education and health. Income includes crops and livestock as well as non-farm and non-agricultural activity, and claims are loans, gifts, social contracts and social security. Each type and source of entitlement can be converted by the individual or household to acquire food necessary for security and survival (Devereux, 2001).

Writing about Sen's entitlement approach, Stephen Devereux highlights the shift from food supply issues to the inability of individuals to acquire food as Sen's most important contribution (Devereux, 2001). He also describes entitlements as a legal concept for Sen, having no basis in moral imperative, and, highlights that market actors have no technical or other reason to meet subsistence needs as a first priority. This observation is important because it speaks to the functional nature of food insecurity and effectiveness of international intervention over time. Having enough food at the national level is no guarantee that it will be equitably distributed regardless of the political or market-based system in place (Sen, 1981). The concept of access has taken root in the academic literature and helped focus the level of inquiry from national to household and individual levels as researchers seek to understand what the experience of food insecurity is like and how people experiencing it manage.

2.5 Indicators of Food and Nutrition Security

Indicators are important tools in the effort to reduce food insecurity and function as reference points for monitoring progress of insecurity reduction strategies. They are constantly being updated, refined, re-purposed and interpreted to provide the most accurate picture of a single element, or index of factors, relating to Food and Nutrition Security. Indicators used in FNS research must be reliable and valid measures that are relatively easy to collect in a wide number of locations and over time (Haddad and Kennedy, 1994). Coates et al. (2006) describe discrete generations of indicators starting with measures of agricultural production and food supply under the old conceptual model of insecurity as an availability issue. The shift from first generation indicators such as the National Food Balance Sheets and the Prevalence of

Undernourishment Indicator produced by the FAO, to second generation indicators such as average income and consumption, can also be traced in the literature. Direct measures of household food consumption patterns and data being collected in household level surveys are third generation indicators of food security. First generation indicators of FNS monitoring are still useful because they provide a baseline for researchers to compare what Haddad and Kennedy (1994) term “alternative” indicators, or those that may be less costly to collect than the traditional indicators. The FAO began publishing a suite of food security indicators in 2013 that provide researchers and policymakers with tools to use in scholarly work and programs targeting reduction of food insecurity (FAO, 2015). Average value of food production and average dietary energy supply are examples of indicators in the availability dimension. The prevalence of undernourishment (PoU), domestic food price index, percentage of paved roads over total roads, and prevalence of food inadequacy are all examples of access dimension indicators. The utilization dimension indicators monitor access to improved water sources and sanitation facilities and the percentage of children under five who are underweight or affected by stunting or wasting.

The evolution of food security indicators runs parallel to conceptual advances in the scholarly discourse. A focus on limited availability of food shifted to an emphasis on limited access to food and resources that can be converted into food (Sen, 1981; Webb et al., 2006). A move from objective to subjective measures of insecurity can be described as an evolution away from proxy indicators, representing the objective view, and towards direct measurement of individual and household experiences of insecurity (Haddad and Kennedy, 1994; Coates et al., 2006; Webb et al., 2006). An example of this is given by Webb et al. (2006), who note how a

derived or objective indicator, such as income, could relate to the concept of food insecurity differently depending on whether food is grown rather than purchased. In other words, a reduction in income will impact a household more severely if they buy most of their food compared to a household that grows the majority of food consumed. Fundamental measurement is a contemporary development in food security research and the indicators and household surveys include detailed social considerations, subjective evaluation, and temporal patterns to better understand the access dimension of food insecurity (Coates et al., 2006). Research and monitoring in the utilization dimension of food and nutrition security has also seen significant growth (Barrett, 2010). Anthropomorphic indicators directly measuring nutrients at the individual level are seen as a reliable method for assessing individual health and nutrition security. Measurement tools and indicators of food insecurity are evaluated through challenges and limitations experienced throughout the history of research and practice. Monitoring and surveillance programs were described by Bapu and Quinn early in the field's conceptual shift: "To date very little published material exists which documents practical field experiences of operating food security and nutrition monitoring systems" (Bapu and Quinn, 1994, p. 212). Others comment on how "relatively little work on indicator performance has been undertaken" (Haddad and Kennedy, 1994, p. 332). Contemporary literature describes a lack of consensus on which indicators to use, leading to an "inefficient multiplicity of survey instruments" (Carletto et al., 2013, p. 30).

In the *State of Food Insecurity in the World 2015*, the FAO describes limitations with its PoU indicator (FAO, 2015). One admitted challenge is that the PoU only accounts for a segment of the reference population: people who are chronically hungry. Transitory insecurity, including

people experiencing chronic hunger for a portion of the year, is difficult to characterize with the PoU because it measures average annual caloric intake. The intra-year variation of caloric intake not being accounted for means that people experiencing chronic hunger for half of a calendar year are not included as undernourished if the average annual intake is above the cut off for the PoU indicator. Another methodological critique that the FAO acknowledges about the PoU indicator is that it does not have any mechanism to measure the severity of undernourishment. All individuals below the threshold are undernourished and those above are not. There is a similar limitation in the distribution of food resources within the household (Coates et al., 2006). If there is unequal distribution between members of a household, the PoU is unable to capture this nuance of insecurity and undernourishment (FAO, 2015).

2.6 A Closer Look: Household Food Security

Investigating the household as a unit of measure takes food security literature from availability-centered research to an investigation of all dimensions captured in the 1996 World Food Summit definition of food security. The WFS definition, widely used in literature and practice, speaks of food security as much more than having sufficient calories for daily activity (FAO, 1996). It has, by design, little conceptual connection to the view of insecurity as a supply issue or the standard for undernourishment produced by the PoU indicator, exclusively a measure of caloric intake (FAO, 2015). The household as a unit of measure contributes to this shift in thinking about food security by using direct data collection methods to uncover subtle differences in groups treated as homogeneous by previous conceptual frameworks and indicators of insecurity (Barrett, 2010). Practically speaking, the household level survey allows researchers

to uncover important details in the experience of, and response to, food insecurity (Webb et al., 2006). It is also able to more accurately quantify the severity of the insecurity, a limitation of previous approaches (Kneuppel et al., 2009). Over the past twenty years, publications with a household centered focus have flourished in the literature (Devereaux, 1992; Maxwell and Frankenberger, 1992; Bapu and Mthindi, 1994; Coates et al., 2006; Kneuppel et al., 2009; Maxwell et al., 2014). Household food security indices, such as the US Household Food Insecurity Access Scale, have been adapted by researchers in both developing and developed countries as a way of monitoring the complex phenomenon of insecurity over time (Maxwell et al., 2014).

As Sen brought forward the dimension of access to food as a means of gaining a deeper understanding of food insecurity and famines, the idea of affected people as participants in their own situation also emerged (Corbett, 1988). Insecurity was described as a managed process where “people are not passive victims of sudden events but are active participants in responding to the risks that they face in their daily lives” (Coates et al., 2006, p 1441S). Responses to insecurity and coping strategies have also been investigated through the household framework, and have informed the field on how food insecure people respond to and navigate insecurity (Maxwell, 1996; Maxwell et al., 1999). Barrett (2010), citing FAO statistics from 2004, points out that only 8 percent of deaths related to hunger and food insecurity were the result of disasters or large-scale shocks faced by a population, and, that 92 percent of hunger-related deaths were due to conditions related to chronic hunger and malnutrition. This important observation about the character of hunger related deaths not only captures a significant driver in the shift to a

household centered analytical focus, but also has implications for the household unit actively participating in improving their own food security status.

The transition from using large aggregate data sets to smaller, household-level surveys, was studied by researchers furthering the conceptual advances made by Sen and others (Sen, 1981; Webb et al., 2006). Simon Maxwell and Timothy Frankenberger wrote an important paper about the concepts in household food security and associated indicators useful for studying insecurity at this level (Maxwell and Frankenberger, 1992). One example given by scholars supporting the use of direct measures is the intra-household variation in food distribution. They point out that women or children in the household may have different access to the food procured by the household and that this variation is not captured by traditional indicators or analysis. Daniel Maxwell and co-workers make the case for the household-level approach saying that it provides a more accurate picture of household consumption, number of members, and other demographic information which does not rely on averages derived from national level statistics (Maxwell et al., 1999).

Measuring the access dimension of food security is a difficult scientific undertaking. Webb et al. (2006) describe the effort to find fundamental measures of food security, asserting that derived measures, such as household income or consumption, are weak because of a presumed relationship with the phenomenon of interest, in this case food insecurity. They write that “[w]ithout first having a clear delimitation of the phenomenon, such indicators are used without empirical evidence of their association to the construct of interest” (Webb et al., 2006, p. 1406S). Studies looking at the household level started with a definition of food security based on caloric adequacy, and used access indicators to locate insecurity in reference populations

(Haddad et al., 1994). Food security is studied through many theoretical lenses and despite being recognized as “complex and multi-directional”, is often examined using derived measures and an assumed relationship (Poppy et al., 2014, p. 3).

Following the move from a supply-side conceptualization of famine and insecurity, the household as a unit became the place to ask questions and advance the conceptual understanding of food insecurity from the objective to subjective experience (Coates et al., 2006). Direct measurements, even with scale imitations and a higher cost of data collection, are valuable because of their ability to quantify factors present in a food insecure household that may or may not be directly related, but are often observed in association with insecurity (Barrett, 2010). Knowledge and analysis of indicator limitations allows researchers to reflect on efficacy and validity to improve data collection and interpretation (Barrett, 2010; Maxwell et al., 2014).

2.7 Leveraging Interdisciplinary Scholarship

Food and Nutrition Security is a robust scholarly field that has collectively, through decades of research and practice, advanced our understanding of food insecurity and responses to food emergencies and chronic hunger around the world. The food insecure as active participants in their own emancipation from insecurity is one important conceptual development, as is the idea of access to food replacing the idea of insecurity as strictly a food supply issue. Formulating policy at the international and national levels requires a firm understanding of these concepts because food security is a basic human need. Incorporating new knowledge into international programs and contract mechanisms across disciplines requires stakeholders to acknowledge where benefit can be achieved and how it is to be distributed. In developing country forestry and

forest policy, there is an opportunity, for policymakers and stakeholders negotiating and delivering new governance regimes such as REDD+, to incorporate well established fields of knowledge creation such as Food and Nutrition Security. Delivering on poverty alleviation and social development objectives that are promoted as co-benefits of REDD+ requires a multifaceted understanding of a complex problem that reaches well beyond forests as a physical location or a place to extract or preserve resources.

Chapter 3: Forestry, Development and Food Security

3.1 Forestry, Food Security and Social Benefit

A relationship between forestry, development, and food security has a long history in the scholarly discourse (Hoskins, 1990; FAO, 1992; Mayers, 2006; FAO, 2015). The contribution that forestry is thought to make in reducing food insecurity includes direct contributions such as agroforestry interventions, or the integration of food and forestry systems (Neufeldt et al., 2009; Asase and Tetteh, 2010). Another contribution of forests to food security is the use of fuelwood for cooking by an estimated 2.4 billion people worldwide including up to 90 percent of rural households in Sub-Saharan Africa (Modi et al., 2005). Resilience in the face of changing global climate patterns is described as a major benefit for people in developing countries. Preserving forest resources as both adaptation and mitigation strategies is thought to increase agricultural productivity and, in turn, food and nutrition security. Conservation initiatives that advocate an increase of forest reserve protection highlight this collective benefit received from forest ecosystem services (Carlsen et al., 2012; Poppy et al., 2014; Grieg-Gran et al., 2015). Forest livelihood activities and forest ecosystems as a feature of adaptation to climate shocks and food insecurity are an additional area of inquiry contributing to this complex field (Robledo et al., 2012; FAO, 2014).

Sunderland et al. (2013) describe potential pathways for improved food and nutrition security relating to forests. Included are livelihood strategies connected to income generation, food acquisition and income during times of shock or increased insecurity. Specifically commenting on REDD+ as a form of Payment for Ecosystem Services (PES), the authors note that while this system may increase income, economic growth does not on its own ensure

improved food and nutrition security. The authors also discuss the current framing of food insecurity as a supply issue, prescribing increased production as a solution. This can drive deforestation without addressing underlying issues of distribution. There is a call for program designers to take into consideration FNS principles as part of program development and implementation and look beyond the idea that food insecurity is driven primarily by a lack of food supply. An article by Borner et al. (2017) synthesizes current research on the effectiveness of PES systems and the assessment work done to date in this field. In developing countries, where PES systems are implemented, an improvement in social and economic conditions parallels the desire for delivery of forest conservation and ecosystem benefit outcomes that often operate in complex policy environments. One research gap the authors highlight relates to trade-offs between achieving desired ecological outcomes and equity in the social aspects of program implementation.

3.2 Social and Economic Benefit from Forests

The socioeconomic benefits derived from forests are the central theme of the FAO *State of the World's Forests* report 2014 (FAO, 2014). The report offers a working definition of socioeconomic benefit from forests highlighting the measurement of magnitude and type of benefit people derive from forests, as research needs. The number of forest-dependent people, as a measure of socioeconomic benefit, is given as an example of an undefined and problematic indicator in forestry: “[I]t is unclear whether an increase in the number of forest dependent people would represent an increase in the well-being of people or not” (FAO, 2014, p. 13). Area based indicators, such as area under SFM, are described as having little value in determining

who receives benefit and how much they receive. This sentiment, that socioeconomic indicators in forestry need to involve people and not just trees, parallels observations made in Amartya Sen's work on starvation and famines three decades ago (Sen, 1981). Speaking to the problems with aggregate food supply as an indicator of food security Sen writes: "Food supply statements say things about a commodity (or a group of commodities) considered on its own. Starvation statements are about the *relationship* of persons to the commodity (or that commodity group)" (Sen, 1981, p.1). In the same way, present indicators used to describe socioeconomic benefit in forestry say little about the relationship that people have with forests, or the type and amount of benefit received. There is a persistent view that food insecurity is a supply issue, and increased production is the solution. Present tools for measuring insecurity largely focus on caloric intake and when this is applied to the contribution of forests, it comes at the expense of many other factors contributing to full food security (Sunderland et al., 2013).

The World Bank's current strategy statement on food security reinforces this simplified conceptualization of the phenomenon:

The World Bank Group works with partners to improve food security and build food systems that can feed everyone, everywhere, every day. Activities include encouraging climate-smart farming techniques, improving supply chains for reducing food losses and strengthening safety nets to ensure vulnerable families have access to food and water
(The World Bank Group, 2017, p. 1).

There is a top down approach in this statement that removes agency from the food insecure while institutionalizing the role of the Bank and partners as entities critical to achieving full food security. Are safety nets the only means by which vulnerable families can achieve access to food and water? Safety nets are important in times of crisis but with respect to stable access and a diverse range of food choices, a long-term solution is unlikely to have primarily

external drivers. In the current analysis of REDD+ forestry and food security, how can REDD+ programs and activities claim to deliver socioeconomic benefit to marginalized stakeholders if there are no tools to effectively map and evaluate this relationship or if there is a simplified understanding the phenomenon? There are many studies in the literature describing the layers and drivers of FNS issues. It would be useful for program designers, when attempting to deliver the co-benefits described in Borner et al. (2017), to understand the issue before moving forward with a weak understanding of the connection between forestry and social benefit, specifically the relationship between forestry and food security. Opportunities for the food-insecure to access benefit (forest food, fuel and economic opportunity) under emergent forest governance institutions in Africa is an important analytical lens for examining the relationship between forests, people, and the social and economic benefits resulting from REDD+ activities.

Chapter 4: Sustainable Forest Management in Ghana

4.1 The Forest Sector in Ghana

Ghana is a tropical timber producing country that since 1960 has produced between 500,000 and 2 million cubic meters of timber per year for the export market (Hansen and Lund, 2011). The forest sector is comprised of both formal and informal sectors with the formal, legal, sector largely supplying the export market and the informal, illegal, sector supplying lumber to domestic markets (Hajjar, 2015). Illegal logging for local and export markets is estimated to double this two million cubic meter per year figure. According to the National REDD+ strategy document, Ghana loses two percent of its forest cover each year meaning an annual net loss of approximately 135,000 hectares (World Bank, 2015). Agricultural expansion contributes half of this area with wood harvesting, population and development pressures accounting for an additional 45% of the loss. In 2008 exports of primary wood products totalled 546,000 m³ (FC Ghana, 2009). This is a small percentage of the annual harvest which was 37.8 million m³ in the same year.

In 2014 Ghana exported 356,000m³ of timber valued at 138 million Euros (FC Ghana, 2014). The production of fuel wood in Ghana in 2014 was 41.5 million m³. This represents an annual increase in fuel wood production, and consumption, of approximately 1.5 million m³ per year while timber exports have waned. This means that in Ghana, and many other African countries, policy direction for forest management is driven by an export market accounting for less than one percent of the total annual harvest. As a governance issue, these figures also indicate that the vast majority of timber harvested in Ghana is done so illegally. The export market for forest products from Ghana has contracted recently and shifted from an EU

dominated customer base to a majority share procured for Asian markets, which do not require chain of custody verification. The demand for timber domestically is growing steadily in Ghana (FC Ghana, 2015).

4.2 Concessional Forestry and Benefit Distribution in Ghana

A concessional system of management has characterized Ghana's forest extraction industry since 1962 when the rights associated with all naturally occurring timber were vested with the President in trust for local government authorities known as Stools (Hansen and Treue, 2008). Under this model a stumpage fee is paid to the central government for the rights to harvest in a designated area, also known as the concession, and the benefit is distributed to stakeholders on a prescribed formula (Government of Ghana, 2016a). Concession holders are given exclusive rights over timber in a designated area for a period of 5 to 40 years. For trees inside a forest reserve the ownership and extraction rights are fairly easy to establish. The same could be said for the benefit distribution from this resource. The process becomes more complicated when dealing with 'off-reserve' timber that is naturally occurring but exists on privately owned land. The timber in this case is still managed by the State and rights can be granted to a third party. In cases like these there is a benefit sharing and compensation formula to account for any damage or loss of income that the loggers cause on private land. This is known as a Social Responsibility Agreement (SRA) and is supposed to form an annex to the government's contract with the logger which is known as the Timber Utilization Contract (TUC) (Government of Ghana, 2016a).

Sharing of revenue generated through timber extraction follows a formula set out by the government of Ghana and is described in Figure 2 below. These figures represent major groups

of stakeholders described in the formula and each stakeholder represents a broader range of constituents in a vertical system of benefit distribution.

Stakeholders	Percentage of Revenue Allocated from Forest Reserves	Percentage of Revenue Allocated from Off-Reserve Timber
Forestry Commission	50	50
Administrator of Stool Lands	5	5
District Assemblies	24.75	24.75
Stool Chiefs	11.25	11.25
Traditional Council	9	9
Total	100	100

Figure 3.1: Forest Reserve and Off-Reserve Revenue Allocation to Stakeholders (Government of Ghana, 2016)

The process to acquire ‘legal’ timber rights, and directly access a form of benefit, is one critique leveled against this system of timber rights allocation. In the process of negotiating and signing a Voluntary Partnership Agreement (VPA) under the European Union’s Forest Law Enforcement Governance and Trade (FLEGT) program, the administrative system of allocation was reformed in Ghana’s Parliament to reflect the desire of the parties to create an open access system of bidding for timber resources. In principle this system allows all citizens to access timber rights from the government through the bidding process. In practice the legislative changes may not be having the desired effect: there is still a cost to submit a bid and a minimum management area of 25,000 hectares that eliminates many stakeholders. The most recent open

bid information on Forestry Commission's website refers to a process held in 2004 though it describes the process and number of qualified bidders without information on who received a concession and the amount of the winning bids (FC Ghana, 2017).

4.3 Community Forestry and Benefit Distribution

There is a history of community forestry in Ghana that is relevant to the discussion of benefit sharing under new forest governance institutions. The Community Resource Management Areas (CREMAs) are a system of governance and engagement with local communities that emerged through a framework to protect wildlife in Ghana's forests (Kumadoh and Bartlett, 2012). The CREMA framework devolves decision making authority to local communities and gives these communities the right to benefit economically from their natural resources (Asare et al., 2013). The process of establishing the CREMA mechanism typically takes 3-5 years and is based on consensus based decision making. An executive committee is established and populated by local community members. The geographic boundaries of the CREMA are established and a benefit sharing structure, describing both monetary and non-monetary benefit distribution, is agreed on by the stakeholders (Asare et al., 2013). One strength highlighted by academics is that the CREMA system allows for the incorporation of traditional knowledge and values systems in the design and implementation of conservation and benefit sharing plans (Asare et al., 2013). The experience in developing and operating CREMAs in Ghana has led some researchers, and the government, to recognize the potential of the CREMA model to manage and deliver REDD+ benefit to local stakeholders through the mechanism (Asare et al., 2013; The World Bank, 2015a).

4.4 Ghana and the UNFCCC: INDC, FIP and REDD+

Ghana is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and has submitted its Intended Nationally Determined Contribution (INDC) and explanatory note to the UNFCCC secretariat (The World Bank, 2015b). The document outlines baseline projected emissions to 2030 as well as actions Ghana will pursue to address climate change and participate in the global reduction initiatives under the UNFCCC. The submission provides budget projections for twenty mitigation and eleven adaptation ‘programmes of actions’ in seven priority economic sectors. The first priority economic sector is sustainable land use including food security. Ghana hopes to raise US\$22.6 billion to finance programme actions including early investments that increase the efficiency of food and livestock production, as well as reforestation projects planting 10,000 hectares each year.

The Forest Investment Program (FIP) is a funding mechanism under the Climate Investment Fund (CIF) established by Multilateral Development Banks and other partners (Republic of Ghana, 2010). Ghana officially sent an expression of interest to the CIF in December 2010 to access grant and loan funding to finance programs and capacity that support Ghana’s REDD+ strategy. Three areas of investment were identified at this time: mitigate the effects of agricultural expansion, particularly in the cocoa growing areas, address unsustainable timber harvesting by supporting sustainable timber supply for all markets, and the clarification of tree tenure rights, particularly in off-reserve areas (Government of Ghana, 2012). This strategy has evolved and the current iteration is described in Ghana’s 2015 National REDD+ Strategy document (Republic of Ghana, 2015). This version identifies agricultural expansion in the cocoa forest landscape and harvesting practices in the northern shea landscape as two areas where separate emission reductions programmes could be established. In addition to these two emission

reduction based initiatives, the strategy outlines a program to reform and clarify tree tenure and carbon rights (Republic of Ghana, 2015).

There is discussion of REDD+ and the potential to deliver benefit to a wide range of stakeholders. The subject of benefit is often discussed in conjunction with social and economic benefit for those people and groups that traditionally do not receive benefit or have limited access to income generating or livelihood activities. The benefit distribution process is complicated by the number of individuals and entities that must act together at a landscape scale to achieve the desired emission reductions (Republic of Ghana, 2015). The National Strategy identifies three types of benefit likely to be generated by REDD+ projects: indirect, up-front benefits including access to technical services, agricultural inputs, and credit or new revenue streams. The second type of benefit is categorized as an indirect, performance based benefit. In this category are non-carbon related resources, community development initiatives or scholarships. The final type identified by the government are direct, performance based benefits which refer to cash payments for “commonly understood performance indicators” (Republic of Ghana, 2015, 36). Examples given include cash payment to CREMA funds for protection of a given geographic area or volume of climate-smart cocoa produced. It is interesting to note here that the performance based payments for farmers and community groups are not related to the number of metric tons of carbon dioxide emissions that programme activities were able to avoid. Similarly, indirect benefits have, by nature, no connection to the production of emission reductions units that will eventually be sold to the Carbon Fund or other markets for environmental services. In the analysis section these conceptualizations of benefit and benefit distribution become important when looking at how food insecure populations can participate in REDD+ programs as a strategy to reduce insecurity.

Chapter 5: REDD+: What is it and how does it work?

5.1 Managing Forests as a Carbon Resource

REDD+ is a framework for reducing carbon loss and enhancing carbon stocks through forest related activities. It was adopted at the nineteenth Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change. REDD stands for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries and was first brought forward in 2005 in a different form but with a similar idea. The + was added at the Bali COP meeting to represent sustainable forest management and the enhancement and conservation of forest carbon stocks. REDD+ is a multilateral framework open to all developing countries. Management and is operationalized through two main organizations connected to the UN: The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and, under the World Bank Group, the Forest Carbon Partnership Facility (FCPF). The organizations play similar facilitation and support roles with the former supported by the FAO, UNEP and UNDP and the later supported by the World Bank.

Both organizations engage developing countries at a national level to undertake legal and operational reforms with respect to forest management and work with donors and governments to design and support activities that reduce and avoid carbon loss and sustainable management of forests (UN, 2015). REDD+ agreements also outline requisite changes in forest legislation and governance policy at the national level in consideration for access to markets for environmental services. The FCPF-REDD+ program follows a similar method, incentivizing national governments in developing countries to adopt principles of SFM, specifically for entry into

markets for environmental services, by providing technical and financial support to develop national programs, and money for forest carbon assets once programs are operational (UN, 2015).

5.2 REDD+ Project Development: From Readiness Preparation to Contract

Procedural details relating to how National Governments and International Institutions plan to operationalize REDD+ projects are important to the access dimension of food security and forestry because the rules set at the International and National levels will govern how these projects are implemented on the ground. They do not prescribe all activities, and there is room for local engagement in the design and utilization of resources being managed. Legally, however, the rules can limit, or enhance, the type and scope of activities being planned at the local level. The process described below traces the development and characteristics of the most advanced system: The World Bank-led Forest Carbon Partnership Facility and the Carbon Fund.

5.2.1 The Forest Carbon Partnership Facility

The Forest Carbon Partnership Facility under the World Bank Group is one of the major organizations or consortiums working to support the development of REDD+ programs and capacity in developing countries. It is the only one managing a fund to pilot performance based payments for projects generating emission reductions in anticipation for a larger market in REDD+ products. There are 47 developing countries classified as REDD country participants and 15 countries and two private entities that are financial contributors to one of two funds: The Readiness Fund and the Carbon Fund. The Readiness Fund is supplied by Donor Participants,

which are all national governments. The Carbon Fund is established by eight national governments, the European Commission, the Nature Conservancy and British Petroleum Technology Ventures Inc. The purpose of Readiness Fund grants to participant countries is capacity building and preparation to engage in the market of emission reductions. The Carbon Fund is designated as source funding for piloting the purchase of ERs from developing countries that have completed the REDD+ readiness process.

5.2.2 Steps in the Readiness Process

The FCPF has a prescribed process that developing countries engage in to move towards ‘readiness’, participation in the Carbon Fund and contracts for emission reduction project activities. The first step is the national entity submitting an ‘early idea’ or ER Project Idea Note to the Secretariat. The country must establish a desire to participate in the program and identify what the threat of loss or projected baseline scenario of carbon loss is likely to be without intervention. Signing a partnership agreement and establishing a national level REDD+ programme office are early steps in the coordination between international and national interests (World Bank, 2016a). Submission of an Emissions Reduction Program Document (ER-PD) is another major milestone and once the plan is reviewed by the FCPF the process can start to negotiate and sign the purchase agreement which then actions the implementation phase and payment for certified reductions.

5.2.3 Parties to a REDD+ ERPA: IBRD and the Designated Program Entity

Once a country has completed the steps in the above process with the FCPF, potentially with funding and technical support from the UN-REDD Programme, they are ready to

operationalize the proposed ER-PD and negotiate the ERPA with the International Bank for Reconstruction and Development (IBRD) acting as Trustee for the Carbon Fund. The designated Program Entity is the ministry or department within the National Government that is responsible and has signing authority to enter the country into a contract for the provision of ERs to the Carbon Fund. A Letter of Intent (LOI) is sent from the authority responsible for delivering and monitoring the project to the signing authority auctioning the negotiation process with the Trustee. It should be noted that the IBRD, as Trustee, is acting on behalf of all contributors to the Carbon Fund for a particular Tranche purchase of ERs from developing partner countries. The Carbon fund is an investment fund that presumably will return profit to the financing partners who have paid-in capital registered with the fund.

5.2.4 Contractual Features of an Emissions Reduction Purchase Agreement (ERPA)

The ERPA is the contract vehicle that monetizes the work done to prepare for the creation of ERs and through which the country will receive payments from the Carbon Fund. The contract is standard for all ERPAs and include a provision to include an addendum called the ‘General Conditions’. As Trustee the IBRD has a wide range of rights under the contract. Roles and responsibilities, transfer of ERs and terms of payment are all described in detail. Article 4.04 provides for the transfer of advance payments to the Program Entity to cover costs such as registry with a certified verification body which is done so at the Program Entity’s expense. Prior to release of this funding the Program Entity must provide the Trustee with a Letter of Credit (LOC) issued by a financial institution having an investment grade (S&P BBB or Moody’s BAA) rating. There are many opportunities for the parties to negotiate and insert additional provisions into the ERPA, including a section that details derivative contracts (call or put options

and exercise prices) that the parties may wish to sign as part of the contract. Provisions for a Program Buffer are also included here as part of the Fund's requirement for a reasonable volume of ER production to be set aside in case of loss, reversal or underproduction of anticipated ERs.

5.2.5 The General Conditions

The General Conditions (GCs) are a name given to a set of articles drafted by the FCPF that form a non-negotiable annex to all ERPAs negotiated between any developing country partner and the IRBD acting as trustee for the Carbon Fund. The General Conditions set out in more detail the terms and conditions of purchase of certified ERs from any Program Entity and are non-negotiable meaning that they are to be adopted as written, regardless of their implication for any given stakeholder or national circumstance. The General Conditions give the Trustee (IBRD) a wide range of rights under the agreement including the right to benefit from derivatives trading coming from an ERPA. This is important for Ghana because it could effectively limit the options that the government has to monetize and market the ERs created as part of REDD+ programmes. The GCs, by engaging the Carbon Fund exclusively with a national Program Entity, limit the options for other sub-national groups of stakeholders to sell ERs that are created in their jurisdiction.

5.3 The Cocoa Forest REDD+ Programme in Ghana

The Ghana Cocoa Forest REDD+ Programme (GCFRP) is the first in a trio of reduction strategies that has been co-supported by the Forest Carbon Partnership Facility and the Forest Investment Program and is the only pilot project in Ghana that has been selected into the Carbon

Fund's 'pipeline' of projects that will monetize ERs produced through a first tranche purchase by the Carbon Fund. The Emission Reductions Project Document (ER-PD) is the programme's guiding document and identifies the expansion of agricultural production, particularly in the cocoa sector, as the most significant driver of deforestation and forest degradation in the High Forest Zone (HFZ) in southern and western Ghana (Government of Ghana, 2016b). It also describes in detail a program that will engage in a landscape (the Cocoa-Forest zone) level intervention that in multiple temporal and special scales. The project is projected to produce 390 million tCO₂e over its 2017-2037 lifetime and will engage over 6 million cocoa farmers in activities that will avoid deforestation and degradation, enhance forest carbon stocks through increased per-acre productivity activities that include provision of agricultural implements, extension services and expansion of carbon stocks in shade tolerant cocoa plantations (Government of Ghana, 2016b). The National REDD+ Secretariat of the Forestry Commission of Ghana and the Ghana Cocoa Board are co-developing and implementing the project which will be represented in the marketplace by the Ministry of Finance, acting as the Program Entity that will enter into the ERPA with the IBRD acting as Trustee for the Carbon Fund. The total cost of the program, readiness and implementation, is US\$199 million, including US\$140 million from the cocoa sector and US\$30 million from the Government of Ghana. Debt financing in the form of loans and grants from multiple sources top up the project financing.

5.4 Sharing Cocoa-Forest REDD+ Benefits

A series of fundamental principles is identified in all the guidance documents about constructing a benefit sharing framework: Effectiveness, Efficiency and Equity. Effectiveness speaks to the program being able to sufficiently incentivize actors to reduce/avoid deforestation

and degradation emissions, efficiency in the operation of the program refers to the maximization of benefits from every unit of input. Equity describes the desire that benefits are distributed to all legitimate beneficiaries (Dumenu et al., 2014). The 2014 report, prepared for the Forestry Commission of Ghana and submitted to the FCPF, also identifies three types of monetary benefit derived from REDD+ projects. Opportunity cost compensation, funding for productive activities and REDD+ rent, the gross income from the sale of Emission Reductions, or estimated global price, minus the implementation and opportunity costs (Dumenu et al., 2014).

The Benefit Sharing Plan (BSP) for REDD+ in Ghana has yet to be finalized and the government is working on modifications to the country's forestry benefit sharing structures and elucidation of carbon rights. In the advanced draft of the ER-PD the government expands on the three general principles above and includes a provision describing participation as voluntary and explaining that REDD+ benefits to stakeholders will not be rent-based revenue but rather return for stakeholder effort in producing the reduction units (Government of Ghana, 2016b). The same draft program document projects that most community benefits will be in the form of 'non-carbon benefits', such as increased income from new land use practices, natural resource-based small enterprise development, improved and less variable crop yields, and more secure ecosystem services" (Government of Ghana, 2016b, 162). The Climate-Smart Cocoa standard that is part of GCFRP is designed to increase cocoa productivity and climate resilience, expand farmer and forest user access to "agronomic resources and other livelihood benefits", and reduce emissions from the baseline by 395 million metric tons of carbon dioxide equivalent (Government of Ghana, 2016b, 24). The interventions planned are detailed and extensive and have been outlined in the ER-RP submitted to the FCPF. They include targeting a number of Hotspot Intervention Areas (HIA) with specific interventions and extension services planned.

One feature of the planning documents is the inclusion of traditional management authorities (Stools and Skins and CREMA boards) in the planning and implementation process. There are pilot projects active in the Cocoa landscape through the Forest Investment Program (FIP) and the government is confident that the planned activities under the REDD+ programme will lead to the halting of deforestation and degradation for cocoa agriculture and a significant increase in productivity. They also anticipate an afforestation/carbon stock enhancement component to the program as the transition to shade grown cocoa is made. The wide range of benefit type and character (direct, indirect, carbon and non-carbon), as well as the diversity of stakeholder participants, requires a detailed look at the dynamics of the Ghana Cocoa Forest REDD+ Programme as a market based intervention and how this is likely to intersect with food and nutrition security in the country, particularly for those who are presently food-insecure. Options for stakeholder engagement, benefit accrued in the operation of the programme and benefit distribution.

Chapter 6: Analysis: Access to Benefit under REDD+ Cocoa-Forest Programme in Ghana

Do people suffering in a state of food insecurity in Ghana have access to benefit through REDD+ contracts as a strategy to reduce their own food insecurity?

One way to approach this question, and link an important dimension of food security research to a forestry intervention such as REDD+, is to apply an access test. The first step is to identify a range of benefit types generated through REDD+ activities and contracts and look at which categories of benefit the food insecure stakeholders are likely to have access to and whether a given type of REDD+ benefit is likely to increase or decrease their food security status.

6.1 Institutional Understanding of Food Insecurity, Forestry, and Access to Benefits

The FAO's assessment that the scholarly work on social benefit indicators in forestry lacks sufficient measurement tools may not fully consider existing work in this area but does point to a direction of further inquiry. REDD+ projects interface directly with people living in and around forests and through the nature of this relationship are engaged in the exercise of using forestry to improve livelihoods, inter-alia food security considerations. It is important for program designers to know about how people benefit from forests. By drawing on a long history of measuring facets of food insecurity using a wide range of available indicators and research methods, proponents of REDD+ projects and supporting entities at the local, national, and international levels, have the opportunity to coordinate data collection investigating specifically the relationship between forests and food security. The Benefit Sharing Plan (BSP) is a critical component of a FCPF member country's 'readiness package' prior to acceptance into the Carbon

Fund’s project pipeline and the final ERPA contract between the Program Entity and the Carbon Fund. The contract with the IBRD, and the benefit sharing plan that forms part of the ERPA, determine access to benefits which is a dimension of food security that dates back to Sen’s work on entitlements. This was a legal concept for Sen and has the same functional nature as part of the ERPA and the distribution of benefits at the national and sub-national levels. Identifying a set of likely benefits emanating from the REDD+ Cocoa-Forest Programme in Ghana and who has access to them and who has right of assignment are steps in unpacking the forestry-food security dynamic.

6.2 Access to REDD+ Opportunities in Ghana

One thread of future research could be the identification of the various types of benefit are likely to come from REDD+ projects and whether these benefits are available to all stakeholders, or a limited set of recognized beneficiaries. REDD+ agreements contain explicit and implicit discussion of improving the livelihoods of stakeholder populations, but there is little information about how these vulnerable populations can access benefit at multiple levels (FC Ghana, 2016).

The National Strategy document discusses social considerations and in the ‘REDD+ Vision, Goals and Objectives’ section identifies “substantial economic and non-economic incentives to improve livelihoods across all regions in Ghana” as deliverables under the program (FC Ghana, 2015a, p. 9). “Substantial” is a term that refers to the magnitude of the incentives and the description of ‘livelihood improvement’ has an underlying assumption that the REDD+

program understands livelihoods connected to forestry and how to measure an increase in benefit (FC Ghana, 2015a, p. 9). The framing of deforestation and degradation in the National REDD+ Strategy also has a social implication in the access dimension of food security and forestry in Ghana (World Bank, 2015a). Factors such as “illegal cocoa farms, illegal food crop farms, unsustainable logging practices, illegal logging and fire” are said to drive “significant damage” and “poor seedling/sapling recovery or regeneration” (World Bank, 2015a, p. 41). Ghana has an initial reduction target of 19 million metric tons of CO₂ equivalent in the first reporting period. In each of the steps in this process the consideration for poor stakeholders was put forward as a positive aspect of the program as were benefits that will accrue to everyone, particularly forest-dependent peoples, through REDD+ implementation (World Bank, 2015a).

6.3 What Type of Benefit and How Much? The REDD+ Cocoa-Forest Programme in Ghana

There are numerous types of potential outcomes, and varying magnitude of benefit from these outcomes, that will accrue to stakeholders through the operation of the Ghana Cocoa-Forest REDD+ Project. Not all benefits are available to all stakeholders, and keeping with the idea that access is an important intersection between forests and food security, a table of likely benefits, as identified in readiness and planning documents, is drafted below:

Description of Potential Benefit	Type of Benefit (Direct or Indirect)	Benefit Delivery Pathways	Magnitude of Benefit	Stakeholders with Access to Benefit	Access Limitations	Hypothesized Impacts on Food Security
Certified Emission Reductions (ERs)	Direct; Transfer of ERs to Carbon Fund	Emission Reduction Purchase Agreement	High	IBRD/Carbon Fund Tranche Participants	Access only available for Carbon Fund Participants	Negligible directly; indirectly is the commodity being traded and is central to all REDD+ activity
Sale of ERs	Direct; Program Entity paid for ERs	Emission Reduction Purchase Agreement with IBRD	High	Program Entity: Ministry of Finance	Only the Program Entity can enter into contract with IBRD/Carbon Fund	Could stabilize insecure situations; could also de-stabilize if stakeholder access is limited because of sale
Technical Assistance	Direct	Ongoing extension services relating to increasing Cocoa productivity	Medium	Cocoa Farmers	Access open to farmers in the Cocoa Landscape; Unknown gender dynamic	Technical assistance for cocoa farmers could spill over into assistance in food crop production
Financial assistance /credit for farming interventions	Direct	Grants or Access to Credit Facilities	Medium	Cocoa Farmers/Project Participants	Limited by available funds; Gender (?)	Direct benefit to farmers in theory, difficulties with budgeting could threaten FNS by overcommitting and under-delivering
Agriculture equipment (fertilizer, pesticides, seedlings)	Direct	Product distributed in HIAs and other communities in the programme area	High	Cocoa Farmers/Local groups and stakeholders	Limited to Farmer stakeholders with existing production	Positive impact if executed, exclusion of landless stakeholders, lessons from previous Cocoa Board interventions and input supply
Improved Social Infrastructure	Indirect	Generalized improvement through long term programme activities	High	All stakeholders in the programme area; other beneficiaries in other parts of Ghana	All citizens and residents to benefit	Direct benefit to communities, threat of status quo distribution model maintained

Description of Potential Benefit	Type of Benefit (Direct or Indirect)	Benefit Delivery Pathways	Magnitude of Benefit	Stakeholders with Access to Benefit	Access Limitations	Hypothesized Impacts on Food Security
Enhanced Land Use Practices	Indirect	Improved Cocoa Productivity	High	Cocoa Farmers	All Cocoa Farmers in HIAs	Potential improvement of FNS status for cocoa farmers, exclusion of non-cocoa farmers
Improved Climate Resiliency	Indirect	Improved Local and Global Climate Resilience	Medium	All Stakeholders	Global Access	Indirect and likely positive effect on FNS, potential to negatively impact if limiting existing strategies and insecurity reduction activities
Forest Resources	Indirect	Enhanced ecosystem capacity for provision of food, fuel and ecosystem services	Medium	Communities and individuals living and working in Ghana's forests	Access open to the extent that is it allowed in the ERPA and under the GCFRP plan	Potential negative impact on poor FNS status by limiting diversity of livelihood and/or coping strategies

Table 6.1: Benefit Types and Hypothesized Impacts on Food Security in Ghana

Source: World Bank Group (2017d).

In general, the emphasis for benefit available to stakeholders and communities living in or near the forests is delivered through programme activities and interventions such as the provision of free pesticides for use on existing Cocoa farms. The increased productivity, and revenue, from the optimization of existing production systems, is one of the major benefit streams to farmers outlined in multiple planning documents for the GCFRP. The language in the benefit sharing section of the ER-PD speaks to the type of benefit and delivery mechanism

envisaged for farmer and local stakeholders. Increased income to farmers is described as “arguably the most important benefit for farmers and will largely underpin the successful implementation of the GCFRP” (World Bank Group 2017d, p. 218).

This statement is useful in understanding the role of local stakeholders and how their benefit is to be delivered. There is a ‘messaging’ strategy that could be interpreted as dissemination of an existing policy rather than an iterative stakeholder engagement process. In other words, cash payments are not an option for farmers and community groups connected to the project.

The threat of ‘elite-capture’ and use of benefit payments being used for patronage are two rationalizations given for investing revenue in social programs instead of paying cash to stakeholders who contributed directly to creating the ERs. This is a legitimate threat that has materialized in other resource allocation processes in Ghana’s forest sector (Hansen and Lund, 2011). By limiting access to cash payments to higher level (international and national) stakeholders, the GCFRP potentially restricts the options available for other levels of stakeholders to engage in markets created by REDD+ projects. Groups organized under the CREMA model, for example, could be unable to exercise their management right and monetize forest resources that under local control outside of the designated national system. Collaboration under the national REDD+ programme will also potentially limit the ability of CREMA groups to access secondary markets for trading options and other derivative products that are explicitly described as a source of benefit in the draft ERPA contract. With a de-jure management right to forest lands, a CREMA board could decide to monetize an area under their jurisdiction as an insurance product, leveraging their control over the commodity to create greater value than through a national level engagement with the Carbon Fund. The benefit sharing plan for the

GCFRP was supposed to be finalized in 2016 and is delayed by complications in re-framing tenure rights and existing forest benefit sharing mechanisms.

6.4 Local Beneficiaries in Ghana

At the center of the benefit flow from the Carbon Fund's purchase of Ghanaian Emission Reductions is the benefit delivered to farmer stakeholders through increased input financing, additional production revenue and/or a bonus payment for producing climate-smart cocoa. This transition in the value chain from a direct connection to the commodity traded to an indirect, or secondary, benefit type is important in the forestry and food security discussion.

The system is potentially very good for farmer incomes, and in turn could help reduce food insecurity in households connected to the farm, such as wage and piece workers. It will also bring technical expertise to the agricultural sector and strengthen a social norm to increase per-acre productivity rather than expand as a strategy for economic growth. A potential challenge with is that the benefit to the farmer for contributing to emission avoidance is not directly connected to the payment transferred from the Carbon Fund to the Government for the avoided deforestation. The farmer or worker's benefit is connected to a secondary commodity, cocoa, which has its own ebb and flow in the global marketplace. A critical question here is whether the incentive motivating stakeholders to preserve carbon stocks can withstand a significant reduction in the coco market? Connecting benefit delivery to multiple commodity markets introduces an extra risk of reversal factor if farmers are forced to continue expansion of their farms to maintain the same level of income. Payments to CREMA funds have a similar complication in that being paid a fixed amount for protecting a landscape or a forest area is a one-time transaction and the

options for a locally led governance system are limited by engaging in the REDD+ activity. An economic analysis could be designed with food security indicators to trace access to benefit under a given program and how the benefits delivered are decreasing or increasing food insecurity in stakeholder populations.

6.5 REDD+ Benefits to the Government of Ghana

The government of Ghana has a unique position in the development of REDD+ projects as both the Program Entity, the body designated to develop the programs that create the emission reductions and enter into the contract with the Carbon Fund, and as administrator of the national and sub-national programs handling the coordination of activities and distribution of benefits to other levels in society. As a stakeholder itself, the government receives funding to build capacity and structures that allow it to enter into contracts for the sale of ERs as well as a financial benefit as a percentage of the ERPA. Traditionally, the Government of Ghana received up to fifty percent of the stumpage revenue from timber sales as the trustee, managing the forest resources for the people of Ghana. It is likely to play the same role trading carbon as a new commodity on the forest value chain. The government has tasked the Forestry Commission and the Cocoa Board with the task of co-developing the REDD+ Cocoa-Forest Programme and as project proponents, these governmental organizations will receive benefit through operational funding provided as part of the REDD+ preparation and operational funding mechanisms. On the cocoa production side of the equation the government will save significant resources that have previously been designated to improve cocoa production as the inputs and technical training for farmers is moved under the REDD+ funding mechanism. Indirect benefits such as social improvement and more comprehensive education and ecosystem service benefit will also benefit

the government as livelihoods and environmental quality in the country improve. The GoG will also benefit from a significant source of certified ERs that could, if designated for this purpose, be applied to Ghana's reduction target under the UNFCCC. Diversifying the resource base will also benefit the government at the international level by adding a resource asset class and reliability in delivery of ecosystem services.

6.6 International Beneficiaries

The benefits received by international actors negotiating agreements in forest management with developing nations are not thoroughly discussed in the literature. In operationalizing the vision set out by Parties to the UNFCCC, to develop REDD+ capacity in developing countries and prepare for market engagement in each jurisdiction, international actors have engaged at multiple levels. There is a significant volume of funding for these activities sourced from international governmental sources involved with one or all of the following programs: the UN-REDD Programme, the Readiness Fund of the FCPF, and the Forest Investment Program of the Climate Investment Fund. These funds are utilized to create the necessary institutional capacity at the national level to identify significant forest carbon loss and design programs that will address drivers of this loss. The other group of international actors are organized under the Carbon Fund which is another sub-program of the FCPF. The Carbon Fund is different from the other funding institutions in one specific way: The Fund is the future purchaser of all the ERs created by developing countries that have met the readiness criteria and have projects accepted. The membership in the Fund is similar to the participants list for each of the other programs with one specific difference. One non-profit entity, The Nature Conservancy, and one private company, British Petroleum, are also invested in the Fund. What this means is

that for each ‘tranche’ that the Fund uses to buy ERs, the beneficiaries who profit from these contracts are the national governments from five to ten developed nations, an environmental NGO and an oil company who are all looking to capitalize on the bulk purchase of ERs and significant options to buy more ER volume at a future date.

The Fund’s legal liability for delivering social benefit under the REDD+ project is limited by contract and responsibility for meeting a designated World Bank Group standard is placed solely on the Government of Ghana. There are sections of the capacity and management systems that are drafted and modified with guidance and instruction from the international level in pursuit of a common standard, or in commodity terms: fungibility. There are no binding clauses in the agreement that either party must improve, ensure, measure, guarantee, deliver or record any social aspects described in the planning documents. Verification, validation and certification of the ERs brings the parties together to sign the contract. The ERPA grants the Fund a wide range of rights as well as immunity from significant risk and liability for non-availability of funds to purchase ERs at the designated time. Papers. Derivative rights are also likely to be of significant interest and potential profit for the IBRD and the Carbon Fund.

Chapter 7: Conclusion

Is REDD+ advantageous or disadvantageous to food insecure populations in Ghana?

There is a degree of uncertainty in the development of REDD+ programs in Ghana since critical pieces, such as a final draft of the Benefit Sharing Plan, have not been submitted to the FCPF. Enough work is completed to track a direction and likely outcomes from the GCFR Project in terms of who has access to each benefit type and how much benefit they will receive. When thinking about how these modifications to the forest value chain will affect stakeholders living in or near forests, particularly food insecure stakeholders, it is important to understand how people access multiple benefits derived from forest activities and how much they benefit from this access. Social benefit indicators and research methodologies in other fields could address what the FAO views as a research gap in metrics about people and forest, and show to what extent this gap is a lack of cross-disciplinary coordination.

Food security considerations fall under the scope of ‘livelihood improvement’ mentioned multiple times in Ghana’s REDD+ program design documents. Thinking about how REDD+ forestry activities could decrease food insecurity necessitates a look at the food security literature and how the history of research describes the character and dimensions of food insecurity. Access to resources is one key feature of this cannon and insecurity has often been observed in conjunction with limited access to resources, both food and resources that can be converted into food. On the positive side of REDD+ programs in Ghana there will be a new source of revenue and forest market activity introduced in the country that can fund activities that contribute to Ghana’s sustainable development and commitments to international cooperation on climate change. Food-insecure people and households in the Hotspot Intervention Areas (HIAs) in the Cocoa production landscape will certainly benefit from increased productivity of Cocoa farms

through increased access to resources and training and increased productivity. A low carbon future and development strategy will provide benefit to all Ghanaians and the global community as climate change impacts are internalized and managed. Further work specifically connecting forestry and food security would be beneficial to this discussion.

The creation of a new forest commodity, Certified Emission Reductions, traded through REDD+ contracts, opens opportunities to diversify the set of resources that people in all social strata in Ghana have access to. But the question of equal access remains. The pathways to receive benefit and options for existing governance structures such as CREMA are, at present, unclear. In the draft framework there is a system of vertical distribution meaning that the benefits will be received by the central government and distributed to sub-national and local authorities before making it to individuals. The Cocoa-Forest REDD+ Programme in Ghana is the project likely to bring the first forest carbon revenue to the country. Planning documents offer a view of how program designers intend to manage the flow of benefits. One telling statement comes recently from the World Bank Legal Department with respect to the Dedicated Fund (DF) earmarked for community benefit:

From the rest of the DF accruals, 30% will be used to set up an insurance program (Cocoa Yield Insurance Scheme). However, based on section 15.2 “summary of the process of designing the benefit-sharing arrangements,” it is unclear whether such an insurance scheme is what the communities prefer as one benefit from the ER program. Section 15.2 only states generally that “benefits sharing options and ideas have been subjected to multiple discussions involving a wide range of public sector, civil society, traditional authority and other stakeholders.” It is unclear to what extent communities were represented in the consultation process and support this benefit option (World Bank Group, 2017a, 1).

Here there is a chance to sharpen REDD+ consultation systems to mandate feedback and reporting at the policy level and create knowledge and tools for evaluation in the research sphere.

Connecting benefit for farmer-stakeholders to another market has its own set of characteristics to evaluate. The GCFRP methodology is premised on the idea that farmers will not need to continue expansive agricultural practices if the productivity on existing farms is doubled, increasing income and technical support. In theory, this logic is sound if cocoa prices were fixed or predictable. As a commodity trading on the international market the price per ton of cocoa is neither fixed nor predictable and if there is a significant drop in the price of cocoa, farmers engaged in the program will experience a similar drop in their REDD+ benefits. A sharp increase in supply in Ghana, a major global producer, may initiate a price drop on local and world markets. Farmers currently receive sixty to seventy percent of the world market price from the Cocoa Board.

International, national and some sub-national actors will engage directly in the market for ERs and will not be affected by a drop in global cocoa prices. Access to monetization options are potentially limited for groups who have established forest management rights over a forest landscape. A question for further research: Can a CREMA group can opt out of the government REDD+ system and market their ER asset elsewhere? A review of the draft Emission Reduction Purchase Agreement (ERPA) for the Cocoa-Forest Programme and the non-negotiable 'General Conditions' point to additional mechanisms for value creation, particularly derivative trading, that are not available to local stakeholders. If, for example, Ghana sells the Carbon Fund \$50 million worth of ERs, as is proposed in the first tranche ERPA, and the Fund uses that asset to leverage \$500 million in derivative contract sales there may be an imbalance in benefit distributed at the international level. Investors in the Carbon Fund benefit the most in this case but the more important exercise at a research level is identifying and disseminating all the types

of benefit created through ER trading as part of the stakeholder engagement process. This could provide all actors knowledge of where benefit is being created and distributed in their country.

As written, the draft ERPA, and the first REDD+ project in Ghana, are not as advantageous to food insecure stakeholders when compared to benefit accrued to other stakeholders in the contract. The available delivery pathways for each type of benefit as well as the magnitude of benefit are important in the distribution of benefit analysis. This work, in conjunction with food security informed research on the ground, could allow policymakers, program designers, and stakeholders to fully appraise the value of the resource being traded. Informed decisions about how to deliver a diverse set of access opportunities to the most vulnerable people and groups connected with forests could follow and have a greater effect in food insecurity reduction. The draft ERPAs between the World Bank and Government of Ghana are not being negotiated with full disclosure of all benefits between multiple levels of stakeholder interests. Food-insecure stakeholders likely do not know about derivative rights that are being signed over to the Trustee by the Program Entity and what the potential value of those rights are. There is a prescriptive element to the stakeholder engagement process where poor people are told about how REDD will operate and what their role is. A more productive approach might be discussing all options and disseminating results as a first step. When inputs and outputs from ER management are public, decisions about an equitable split between stakeholders can take place. If significant value in ERPAs are kept secret from stakeholders, or at least not published beyond the contract, there is a risk of overcompensating some interests at the expense of stakeholders with less power and influence in the process, often those conducting the work on the ground. Empowering active stakeholders with an equity share in projects to co-

create and manage ERs is the most efficient approach to reducing food insecurity using the REDD+ framework in Ghana.

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