PLANNING FOR FOOD SECURITY AS IMPACTED BY URBANIZATION AND GENDER: A CASE STUDY OF DAR ES SALAAM

By

Sarah Murray

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Urban and Regional Planning - Master of Urban and Regional Planning

2015

ABSTRACT

PLANNING FOR FOOD SECURITY AS IMPACTED BY URBANIZATION AND GENDER: A CASE STUDY OF DAR ES SALAAM

By

Sarah Murray

In rural areas of northern Tanzania, capacities of households to cope with food insecurity is decreasing due to increasing vulnerabilities, an example being the increase of droughts as a result from climate change, (Webb, 2010). The diminishing ability of rural households to sustain livelihoods often acts as a push for more vulnerable groups (such as women) to migrate to urban areas. The focus of this thesis is to examine this movement in a case study of female rural-urban migration in Tanzania between the northern, rural region of Kilimanjaro and the urban center of Dar es Salaam, and determine if migration is improving the well-being of the women who migrate and the well-being of their households.

Findings from the interviews demonstrate that women are migrating from the Kilimanjaro region to Dar es Salaam primarily in search of greater economic opportunity. Additionally, rural-urban migration has increased food security for women and their households as reflected by the variety and increased access of food they are able to consume in Dar es Salaam. The interview responses also indicated that migration has improved well-being for women and their households as reflected by the response that the majority of women interviewed are choosing to stay in Dar es Salaam and do not plan to return to their community of origin.

For Cecilia

ACKNOWLEDGMENTS

I would like to express my sincerest thanks to the all who contributed to this journey. Dr. Peilei Fan, Dr. Jennifer Olson, Dr. Zeenia Kotval and Dr. Mark Wilson: for the endless supply of help, direction, patience and inspiration they brought to my time at MSU and all the opportunities they opened up for me; Cecilia, who was my partner and guide in Dar es Salaam and without whom I would have been hopelessly lost; Mama Mshgeni and the Center for Climate Change Studies at the University of Dar es Salaam, for their critical assistance in my field work and their kindness while hosting me in Dar es Salaam; the Tanzanian National Food Security Division of the Ministry of Agriculture, Food Security and Cooperative; Dr. Zeenat Kotval, Dr. Eva Kassens-Noor and Dr. Trish Machemer for their confidence, encouragement and guidance; the people and experiences in Benton Harbor that prompted me to apply for graduate school; my Bloomington family who gave me love and courage; and a particularly special thanks to all my patient and understanding friends and family, for their love, support, encouragement and relentless belief in me.

Funding was initially provided from the Michigan State University Global Center for Food Systems Innovations (GCFSI), and I would like to thank Dr. Joseph Messina, Dr. Jennifer Olson, Dr. Nathan Moore and the rest of the Mega Trend 1 team, as well as Mr. Thomas Smith, for their support and mentoring during my experience with GCFSI, and introduction to researching international food security and food systems. I would like to thank the Center for Advanced Study of Urban Development and the African Studies Center at Michigan State University, from whom I received Foreign Language and Area Studies Fellowships for the summer of 2014 and the 2014-15 Academic Year. Specific thanks to Jennifer Brewer, Dr. Ann Biersteker and Lisa Hinds. Finally, a very special thank you to the Michigan State University School of Planning, Design and Construction, for their funding, support and all of the opportunities they provided me throughout this incredible experience.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

KEY SYMBOLS OR ABBREVIATIONS

CCCS	Center for Climate Change Studies
CIA	United States Central Intelligence Agency
FAO	Food and Agriculture Organization of the United Nations
FTF	United States Government's Feed the Future initiative
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
MAFC	Tanzania Ministry of Agriculture, Food Security and Cooperatives
NBS	Tanzanian National Bureau of Statistics
PDI	poor dietary intake
SSA	sub-Saharan Africa
TSH	Tanzanian Shillings
UDSM	University of Dar es Salaam
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNDP	United Nations Development Program
UNPD	United Nations Population Division
WFP	United Nations World Food Program

1. INTRODUCTION

Despite exponential growth in overall global food production over the past forty years, sufficient food supplies at the national level have not translated to food security at the household and individual level, as approximately one billion people in the world remain undernourished. According the FAO, since the year 2000, SSA is the only region in the world where the per capita food output continues to decrease while facing rising malnutrition – as a result of falling food consumption (Gould, 2008). This is well illustrated throughout Tanzania, where as much as half of the population is unable to meet its basic nutritional needs. In rural areas of northern Tanzania, capacities of households to cope with food insecurity is decreasing due to increasing vulnerabilities, an example being the increase of droughts as a result from climate change (Webb, 2010). The diminishing ability of rural households to sustain livelihoods often acts as a push for more vulnerable groups (such as women) to migrate to urban areas.

Rural-urban migration is a response to perceived opportunity and inequities of income between the communities of origin and destination communities. Along with the escalation of rural-urban migration, there has been a considerable increase in single female migrants in Tanzania over the past twenty years. Female rural-urban migration is occurring in growing numbers despite cultural constrains pertaining to gender norms and limitations for employment (Beegle, De Weerdt & Dercon, 2011; Msigwa & Mbongo, 2013). Women in Tanzania face additional challenges in securing stable livelihoods, as they often have restricted access to vital resources, such as education, employment opportunities, land ownership and credit.

This paper examines female rural-urban migration occurring in Tanzania, from communities in the northern region of Kilimanjaro to the city of Dar es Salaam to determine if migration is in fact improving well-being, reflected by indicators of food security, of the women who migrate and the

well-being of their households. Field research was conducted during August 2014, and focused on addressing the following questions:

1. Why are women and female-headed households moving to Dar es Salaam?
2. What is the role of climate change in their decision to migrate?
3. Is migration improving their well-being, specifically food security, and the well-being and food security of their households?

Prior to conducting fieldwork and interviews, the hypothesis was that the rapid urbanization of Dar es Salaam, which has resulted in widespread informal housing settlements lacking basic services and infrastructure, combined with culturally embedded discrimination against women, regarding access to education and types of employment, has prevented female migrants and female-headed households from improving their livelihoods, well-being and food security, despite having improved access to services, such as health care and education, as a result of having migrated to Dar es Salaam.

In Tanzania, rural women are found to be some of the people most vulnerable because they have limited diversification opportunities, as they already face challenges in accessing public services, land, employment and markets (Paavola, 2008). These inequalities are attributed as drivers of female rural-urban migration in Tanzania; facilitated through social network connections, young women to leave their communities of origin to seek out economic opportunities in urban areas that are not directly dependent on landownership (Tacoli & Mabala, 2010).

Although there is a wealth of literature and research dedicated to rural-urban migration, studying female migrants exclusively has not been as thoroughly examined and rarely are their experiences upon arriving in destination cities documented. Predominantly, migration literature and research focuses on the pushes and pulls that cause a person or a group of people to relocate, temporarily, seasonally or permanently. Attention is paid less often, however, to the ramifications of

population mobility *after* migrants arrive to destination communities. From a planning and policy perspective, this research provides an understanding about the quality of life available to women arriving in mega cities in developing countries, such as Dar es Salaam. This information is crucial for the planning implications of rural-urban migration, in order to ensure that cities offer equity, opportunity and inclusion for all their residents and those who are seeking to be residents. Therefore, the contribution of this research is twofold: (1) giving a voice to the experiences of women who participate in rural-urban migration; and (2) understanding how rural-urban migration impacts the well-being for women who choose to migrate, as well as the well-being of their households, *after* they have migrated.

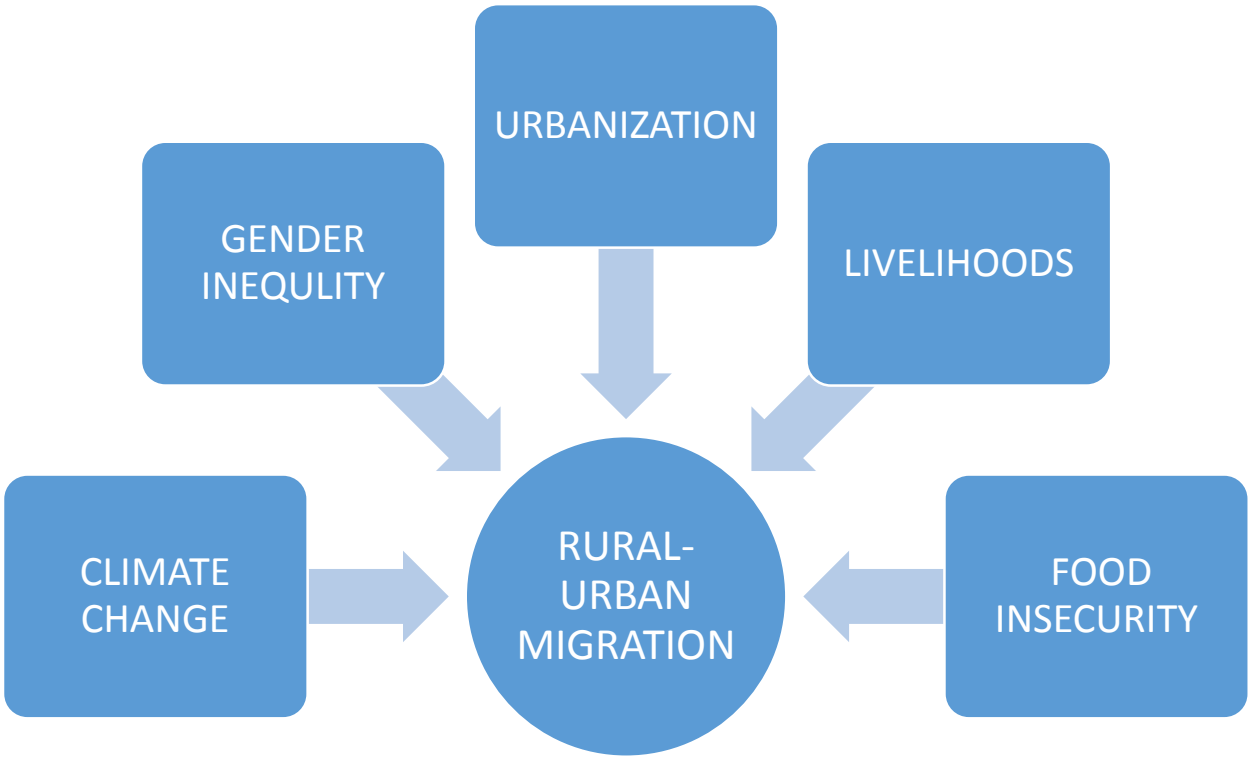
The next chapter contains a literature review that provides an analysis of theoretical knowledge and previous studies conducted on migration and issues of food security, climate change, gender, urbanization, livelihoods and social networks embedded within migration. Following the literature review, Chapter 3 gives a description of the study area, contrasting the Kilimanjaro region to the city of Dar es Salaam. After which, the methodological approach for the research is presented in Chapter 4. A glimpse of the markets in Dar es Salaam, where the field interviews occurred is then provided in Chapter 5. Next Chapter 6 provides an analysis of the results and findings of the interviews, followed by a discussion in Chapter 7, in which the author reflects on the data presented in the previous chapter and considers the planning implications for increasing the well-being of female migrants and their households in Dar es Salaam. This paper concludes with a chapter on policy implications and recommendations based on the author's findings.

2. LITERATURE REVIEW

A literature review was conducted in order to examine the existing theories surrounding intersection of rural-urban migration, food security, climate change and gender issues in Tanzania, and to identify gaps in existing knowledge pertaining to these phenomena. As demonstrated through the literature presented, there are multiple push factors causing female rural-urban migration in Tanzania. At the same time, there are numerous pulls to urban areas, further motivating female rural-urban migration in Tanzania. Women who migrate to urban areas, however, still face discrimination, an example being that female employment in many African countries tends to remain in certain low-income sectors, despite the fact that increasingly female rural-urban migrants are educated and seek higher income positions appropriate for their educational attainment (Gould, 2008).

Understanding the relationship between the influences leading to female rural-urban migration as discussed through the literature review can be summarized as follows: the existing social order which foster gender inequality, coupled with growing land and environmental pressures as a result of climate change, creates uncertainty for livelihoods, which influences an individual and household's food security. When facing food insecurity, or the threat thereof, women in northern Tanzania are pushed to migrate to urban areas, specifically the city of Dar es Salaam. This migration is often facilitated through social networks. Finally, the rural-urban migration occurring contributes significantly to Tanzania's rapid urbanization rate. The consequences of rural-urban migration occurring from the northern region of Kilimanjaro to Dar es Salaam must be examined, as many of the factors attributed to driving rural-urban migration exist within urban settings as well.

Figure 1: Contributors and Consequences of Female Rural-Urban Migration



2.1 Migration

Migration, or the relocation of people within space that involves their permanent or temporary change of residence, has been occurring within human populations for thousands of years, often as a response to unequal distribution of resources, among which include natural resources and employment opportunities (Tacoli & Mabala, 2010). The number of migrants in SSA is growing (Naudé, 2004), and increasing poverty is widely regarded by social scientists to be a direct correlation with increased migration (Adepoju, 2008).

There are numerous theories of migration, spanning a multitude of disciplines. The main focuses of migration theory examine the following: (1) patterns of migration; (2) determinants of

migration; and (3) effects of migration (Bilsborrow, 1998; Gould, 2008). Migration is spatial mobility of a person or persons from one geographical unit to another; this movement involve a change in usual residence, often without knowing when, if, or where their next move will be (Bilsborrow, 1998; Gould, 2008).

Patterns of migration can often be complex and are explored later in this chapter. The causes of migration, however, tend to be more clearly identified, and most migration theorists acknowledge the predominant role of economics in population mobility: people move from poorer areas to areas with greater opportunity for wealth (Gould, 2008).

Neoclassical economic theory hypothesizes that migration flows, from a macro level, tend to occur from low-wage areas to high-wage areas until wage differences become narrowed to the point of equaling the cost of migration (Bilsborrow, 1998). Lewis (1954) wrote a seminal piece explaining this concept, called the economic dualism model, which was expand upon a decade later by Fei and Ranis (1964), who analyzed labor force and the application of technology in both rural and urban areas in developing countries. They found wage levels to be very low – almost to the point of zero – in rural areas due to labor surplus. Conversely, labor was scarce in urban areas, which – coupled with greater application of technology – resulted in higher wages. Fei and Ranis concluded that the gap between rural and urban wages drives rural-urban migration (Bilsborrow, 1998). Todaro similarly hypothesized that rural-urban migration will occur provided there is a significant wage gap between rural and urban areas, despite potentially high unemployment rates in urban destination areas (Bilsborrow, 1998).

From a social science perspective on migration, Malthusian ideas on poverty and development, which pertain to population growth beyond means of subsistence, are perhaps most commonly known and remain toted by demographers. At the end of the eighteenth century, Malthus considered

uncontrolled population growth as a cause of poverty and a constraint on development – there were too many people and not enough resources (Gould, 2008). His belief that population growth would outpace food production has since been used by scientist to explain drivers of human mobility, as diminished production capacity in one area pushes people to migrate in search of resources. Alternatively, during the same era as Malthus, Godwin argued that population growth is not the cause of poverty, rather poverty results from the inequities of access to available resources as measured through the distribution of income and wealth (Gould, 2008). Since then, significant evidence has demonstrated that global development is best achieved through more equal distribution of the world's wealth (Gould, 2008). Godwin's argument is also used to shape migration theory, as people are pulled to places they believe to have greater economic opportunity, enabling their share in and access to resources to grow. As such, raising the standards of living and overall quality of life has been determined of greater importance by policy makes that focusing on measures to control rates of population growth (Gould, 2008).

Economic conditions are widely regarded as the main determinant in rural-urban migration. Determinants are divided into push and pull factors, or the conditions that push migrants from their communities of origin and pull migrants to a new community; an example being the *push* of poverty in rural communities and the *pull* of perceived economic opportunity in urban centers (Muula, 2005; Naudé, 2004). Adepoju (2008) defines poverty as a state in which people lack access to necessary economic and social resources as expressed through lack of purchasing power, poor housing, illiteracy and lack of access to water. SSA is the world's poorest region (Adepoju, 2000; 2003). Extreme poverty across the continent, coupled with the rapid population growth and increased labor force, is believed to have intensified rural-urban migration as rural laborers without the means to improve their living conditions are attracted to better living conditions achievable through higher salaries, and therefore leave rural areas in search of wage labor in the cities (Adepoju, 2003). Urban labor, however, remains

segmented in developing countries, and not all who migrate find the level of economic advancement they were seeking. An example of this can be found in the socio-economic status of women: rural women who do not migrate often have the lowest status and are found to be extremely poor, whereas women who migrate to urban areas usually improve their welfare at least marginally, rising from the status of extremely poor to that of just poor (Khasiani & Okoth-Okombo, 1995, p. 2).

When examining migration, analysis is broken into *who* is migrating and to *where* are they migrating. There are temporary and permanent migrations, and local and long distance migrations (Paavola, 2008). Geographic groupings of migration include intra-regional, inter-regional/internal and international migration (Adepoju, 2000), the subcategories of which include rural-rural migration, rural-urban migration, urban-rural migration and urban-urban migration. The types of geographic migration and the commonly held understandings of their drivers are displayed in Table 1. This thesis focuses on rural-urban migration.

Table 1: Typology of Internal Migration

Mobility					
	Circulation			Migration	
	Daily	Seasonal	Long-term	Irregular	Permanent
Rural-rural	Home to farm: movement of agricultural workers such as produce and livestock dealers	Pastoralists; harvest labor; displacement due to environmental degradation (drought)	Labor migrants to agriculture, mining, or other rural sectors; migrants leaving population pressure areas	Environmental refugees; displacement resulting from conflict between ethnic groups	Resettlement; marriage migrants
Rural-urban	Home to school; movement of agricultural produce dealers/sellers		Labor migrants moving out of agriculture	Environmental refugees	Labor migrants
Urban- rural	Urban market traders for supplies (e.g. soap, foods, medicine)	Visits of urban workers to rural homes; tourists; return migration of urbanites during peak agricultural seasons	Labor migration to rural agro-industrial and mining nodes; return of retirees and unsuccessful urban migrants	Displacement resulting from political, ethnic or religious conflict	Retirement migration
Urban-urban	Commuting; movement of the self-employed (e.g. traders)		Transferred workers; self-employed (e.g. traders, relocating business people)		Residential change

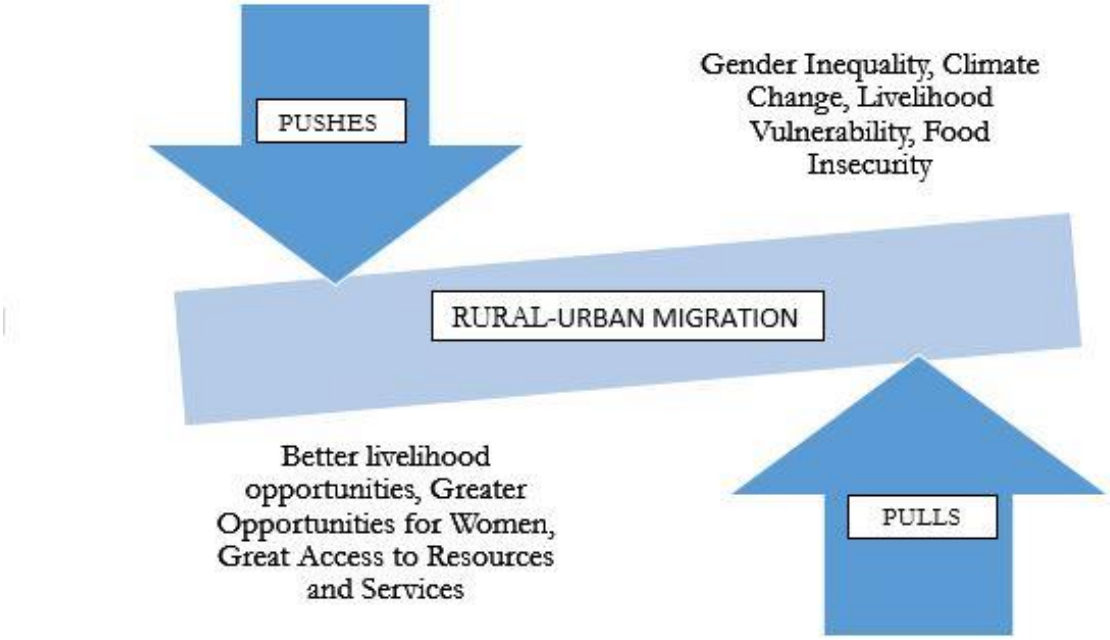
Adapted from: Gould, 2008; Oucho, 1998

Rural-urban migration is widely considered as contributing to surplus labor, and uncontrolled expansion in urban areas (Beauchemin & Bocquier, 2004). This type of migration predominantly occurs as a result of perceived economic opportunity in urban centers and is regarded by those considering migration to be a means of escaping economic conditions of poverty.

Rural-urban migration is a response to perceived opportunity and inequities of income between the communities of origin and destination communities (Lipton, 1980). The *perception* of increasing one's economic opportunity is important to stress because rural-urban migration continues to occur despite high unemployment and underemployment in urban areas, although "on average, migrants must be better off in urban places, or rural out-migration flows would slow (Beauchemin & Bocquier, 2004, p. 2247)." The perception of opportunity for higher wage employment is pulling migrants to urban centers in developing countries, resulting in greater urbanization, or the proportion of the total population living in urban areas. The spatial ramifications of urbanization have a dramatic effect on land use and resources, which is why rural-urban migration is described by Mberu as "the most significant form of movement for long-term spatial redistribution (2005, p. 141)." Rural-urban migration in itself, however, is neither positive nor negative, rather migration is often a crucial aspect of both population dynamics and economic change (Martine & Schensul, 2013).

The push for migration is primarily a result of insufficient livelihood opportunities, which are increasingly influenced by stressors related to climate change. According to the US Government's Feed the Future initiative, 75% of the Tanzanian labor force is employed in agriculture, and the majority of Tanzania's agriculture remains rain-fed based (FTF, 2012), which exposes livelihoods to risks associated with increasing variability in precipitation. In rural areas, capacities of households to cope with food insecurity is diminishing due to increasing vulnerabilities, such as increase of droughts as a result of climate change (Webb, 2010).

Figure 2: Pushes and Pulls of Rural-Urban Migration



Coping is the way in which people respond when confronted by disaster or unanticipated livelihood failure in order to maintain well-being, such as drawing down on savings, obtaining gifts from relatives and selling livestock or other asset sales (Ellis, 2000; Erisen et al., 2005). Diversifying livelihoods is frequently employed as a coping strategy in order to mitigate risk and uncertainty (Erisen et al, 2005). Coping, however, is different from adapting, which is strategic anticipation of potential livelihood failures. Adaption methods often disperses risk across diverse activities, ultimately reducing the potential need for coping; an example being changing to less climate sensitive forms of agriculture (Ellis, 2000; Erisen et al., 2005). Migration, therefore, has become as a mechanism for agricultural households to cope with failures in livelihoods by spatially dispersing their assets in order to develop a safety net for times of economic and social insecurity (Bah et al., 2003; Paavola, 2008).

Migration represents strategies of households and individuals who are seeking to increase their share of national resources (Khasiani & Okoth-Okombo, 1995). Households are usually the unit of

analysis utilized when studying migration (Tacoli & Mabala, 2010). The decision to migrate is more often than not made at a household level. Intra-household dynamics – particularly the relationships between genders and between generations – are often as significant of determinants as inter-household inequalities (such as class) for who migrates and who stays (Bah et al., 2003; Tacoli & Mabala, 2010). Families select a member to invest in, who has greatest earning potential, with an agreement that financial resources, or remittances, will be sent back to help support the family (Adepoju, 2008). Historically, migrant populations have consisted almost exclusively of males, seeking economic opportunity to support their families; however, increasingly women are also migrating in order to seek out economic opportunity, despite cultural constrains pertaining to gender norms and limitations for employment (Beegle, De Weerdt & Dercon, 2011; Msigwa & Mbongo, 2013). Women in rural Tanzania face additional challenges in securing stable livelihoods, as they often have restricted access to vital resources, such as education, employment opportunities and credit.

Remittances are a crucial source of income for the remainder of the migrant's family who remain in the sending community and often can serve as a significant social link between migrants and their home communities. (Bah et al., 2003; Tacoli & Mabala, 2010). The assumption made here is based in neoclassical theory that labor maximizes its returns (Khasiani & Okoth-Okombo, 1995). The surplus labor force is increasingly pulled to urban centers by higher salaries and better living conditions (Adepoju, 2008; Lipton, 1980). With the potential for higher wage earnings in urban labor than in rural labor, migrants are able to remit money to their families who remained in the sending communities, in order to hire labor to make up for their absence or invest in farming resources as a means of increasing agricultural productivity (Khasiani & Okoth-Okombo, 1995). This being the case, rural-urban migration has become a mechanism for agricultural households to spatially disperse their assets and develop a safety net for times of economic insecurity. (Bah et al., 2003; Paavola, 2008).

Migration theories assume the decision to migrate is made by individuals or households, based on calculations of expected gains compared to possible costs (Curran & Saguy, 2013). Such assumptions, however, do not take into account the vital role of social networks, which for many is a key factor in the decision to migrate (Bilsborrow, 1998). Having friends or relatives in the destination city is an important channel for receiving information and minimizing risk (Bilsborrow, 1998; Curran & Saguy, 2013).

Rural-urban migration becomes less risky for individuals when they know someone in the destination city (Curran & Saguy, 2013). The larger the number of migrants from a specific area or sending community, or the denser the network of migrants, the more reliable the information is perceived to be about the destination community and the migration process (Bilsborrow, 1998; Curran & Saguy, 2013). Ethnic and family links are particularly important for migrants, as they are largely used in assuring accommodation upon arrival to the destination community, as well as lining up employment (Bilsborrow, 1998; Curran & Saguy, 2013; Gould, 2008). For example, it is not uncommon for migrants to secure employment prior to leaving their communities of origin, particularly through a social network connection (Bilsborrow, 1998). Additionally, employers may utilize networks as a method of recruiting labor (Curran & Saguy, 2013).

Reliance on social networks during rural-urban migration impact a migrant's assimilation to the destination area (Curran & Saguy, 2013). While the initial reliance on social networks is intended to ease adapting to a new place, social networks – through their reinforcement of ties to sending communities – have been found to lead to segregation of migrant communities, particularly when it comes to housing (Curran & Saguy, 2013). Considering the segmentation of urban labor markets, and the value of from whom information is received within a person's social network, female rural-urban migration often perpetuates class segregation with limited opportunity for women's economic

mobility (Curran & Saguy, 2013). That being the case, migrant networks are effective resources for those arriving in urban centers, both from a financial and social standpoint (Curran & Saguy, 2013).

2.2 **Climate Change as a Driver of Rural-Urban Migration**

Since the year 1988, the Intergovernmental Panel on Climate Change (IPCC) has been the foremost international organization charged with assessing climate change by the United Nations Environmental Program and the World Meteorological Organization[1]. In the year 2007, the IPCC defined climate change as the following:

> […] a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any changes in the climate over time, whether due to natural variability or as a result of human activity[2].

Climate change will continue to materialize as extreme weather events, specifically droughts and floods; changes in mean temperatures, precipitation and sea level; depleted water resources; and land degradation, as observed through loss of productivity or reduction in ecosystems by way of soil erosion, deterioration of soil properties and long-term vegetation loss (Homer-Dixon, 1994; Tacoli, 2009).

The measurable impacts of climate change – among which include drought, desertification soil degradation and changing rainfall patterns – significantly affect livelihoods in rural areas, which are predominantly reliant on natural resources (Martine & Schensul, 2013). Climate change is, however, highly variable across space – due to geographical variations such as topography and average temperature – which augments the challenge of predicting the full extent of its impact (Thornton et al., 2009). Variability may best be accounted for through regional and local assessment, which may more accurately predict future both climate impacts, such as that on food production, and the ability of populations to cope or adapt, as more localized assessments may also better account for poverty

[1] Retrieved March 3, 2015, from http://www.ipcc.ch/organization/organization.shtml
[2] Retrieved March 3, 2015, from http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html

levels and households' access to resources (Moore et al., 2011; Thornton et al., 2009). The range of diverse climatic conditions across Tanzania encompasses dry lowlands to wet highlands and climate change predictions anticipate the country will see an increase in annual temperatures and annual precipitation by the year 2100 (Moore et al., 2012; Muthoni & Wangui, 2013).

Climate extremes have already begun to negatively impact the most vulnerable population in developing countries, specifically that of decreasing food security, incomes/livelihoods and available resources (Muthoni & Wangui, 2013; Smucker et al., 2015). Currently, more than a third of the world's population is living in countries suffering from water stress (meaning that they were withdrawing more than 20% of their available water resources) and the United Nations Comprehensive Assessment of the Freshwater Resources of the World estimates that by 2025, as much as two-thirds of the world's population will be living in water-stressed countries, including one-third of the population in Africa (Arnell, 2004). The potential for severe famine is great if the frequency of droughts persists in the region, as the time for soil regeneration today has changed significantly, not only as a result of changed climatic conditions, but also increased population and changing land uses (Huntingford et al, 2005; Wittig, König & Starzynski, 2007). Existing trends of rising temperatures are expected continue throughout sub-Saharan Africa and cause more frequent and more intense extreme weather events, in addition to contributing to the retreat of glaciers and rising sea levels and further exacerbating conditions of water stress (Adger et al, 2003; Douglas et al, 2008; Reuveny, 2007). Over the past two decades, extreme temperatures and precipitation events as a result of global climate change have become increasingly notable and the number of extreme weather events per year has doubled in Tanzania – particularly in the form of droughts, which act as a push for migration out of rural areas (Laczko & Aghazarm, 2009). These changes are predicted to contribute to augmenting the mobility of human populations (Homer-Dixon, 1994; Huntingford et al, 2005; Tacoli, 2009; Warner et al, 2009). According to Ocello et al, "Mobility might be expected to increase following extreme events,

such as storms, floods, and droughts; as well as in response to gradual changes in temperatures, precipitation, and sea levels (2014, p. 2)."

There remains significant debate, however, pertaining to the importance of environmental change as one of several factors in population mobility (Martin & Schensul, 2013). An example of the widely differing views surrounding this concept stems from differences in the understanding of causes of migration: one school of thought views migration as a failure to adapt to environmental degradation, while another considers migration as key adaptive strategy for well-being (Martin & Schensul, 2013; Ocello et al., 2014).

Households that are most vulnerable are those that lack the assets or social support to cope or adapt during periods of adversity and are ultimately the most prone to food insecurity (Ellis, 2000). Vulnerability is generally understood as a high potential to be adversely affected by risks, shocks and stress or an event or change (Ellis, 2000). A household or individual's level of vulnerability is determined by their ability to withstand shocks and stresses to livelihoods. Vulnerability can result from both physical and social causes – physical vulnerabilities resulting from individual and direct exposure to physical hazards, while social vulnerabilities are often influenced by societal constructs and hierarchies, such as class and income distribution, gender, age and education (Erisen et al., 2005; Paavola, 2008).

Vulnerability to climate change is tied to economic and political weakness (Parks & Roberts, 2006; Thomas & Twyman, 2003). The impacts of climate change are not evenly distributed and people living in the Global South are often more vulnerable to the effects of climate change than those in the Global North (Adger et al, 2003; Black, Kniveton & Schmidt, 2011; Thomas & Twyman, 2003). As countries have more developed and diversified economies, their agricultural practices become more efficient and less dependent on human labor (Huntingford et al, 2005), which results in greater income

diversification and ultimately lessens the population's vulnerability to climate change. Countries with less technological advancement, weak or unstable economies and higher dependence on the environment for subsistence generally aren't as equipped to take on mitigation or adaptation efforts to address the environmental problems resulting from climate change, leaving their populations more vulnerable to its impacts (Morton, 2007; Reuveny, 2007).

Vulnerable populations generally are those with the lease capacity to adapt (Holler, 2014). Often subgroups within populations are more vulnerable than others, usually those who are most dependent on traditional responses to environmental variability, those with the least assets, those who are the least represented (Martine & Schensul, 2013). In Tanzania, some of the most vulnerable groups are currently rural women, children and pastoralists because they have limited diversification opportunities as they already face challenges in accessing public services, land, employment and markets (Paavola, 2008). According to Holler (2014), social inequity and vulnerability are often perpetuated and intensified as a result of adaptation and coping strategies to the impacts of climate change.

Adaptation is the ability of populations to systematically adjust to climate change and to take advantage of new opportunities or to cope with the consequences (Adger et al, 2003; Martin, 2010). Adaptation ought to improve conditions for vulnerable populations, yet frequently they reinforce existing conditions and systems of marginalization and social inequity mediated by political and social institutions that determine access to and control over resources (Holler, 2014; Kates, 2000). As such, the very inequalities that were intended to be eliminated may instead be reproduced (Holler, 2014). Holler (2014) argues that for adaptation processes and policies to be effective and sustainable, they must increase access and eliminate constraints to resources, ultimately changing the social, political and economic context that created the vulnerabilities in the first place.

Women are often one of the more vulnerable population groups, due to their frequent lack of access to resources and decision-making opportunities. At the same time, however, research conducted by Muthoni and Wangui (2013) found that in the Mwanga District of Tanzania's Kilimanjaro region, women were found to be central agents for enacting adaptive measures to climate change, at individual, household and community levels. Their contribution of labor and other resources combined with utilizing social networks and interaction was deemed crucial to successful implementations of adaptive strategies, ranging from ensuring educational attainment to implementing new see varieties or planting times to adjust to changing rain cycles (Muthoni & Wangui, 2013). Despite their crucial role in strengthening adaptive capacity to climate change, however, women in this district were still excluded from both informal education opportunities and local decision making (Muthoni & Wangui, 2013). This reinforces Holler's (2014) argument that sustainable adaptation needs to address the social, economic and political systems which initially created vulnerability.

Climate change is increasingly seen as an issue that impacts human security, or the condition where people and communities have the ability to manage and adapt to stressors to their needs, rights and values (Barnett & Adger, 2007). As the access to, and the quality of, natural resources that sustain livelihoods change due to climate variability, the resulting environmental scarcity and increased competition over natural resources may in turn result in violent conflict (Barnett & Adger, 2007; Black, Kniveton & Schmidt, 2001; Homer-Dixon, 1994). Growing conflict as a result of environmental scarcity at this time has generally been in response to a lack of available freshwater and scarcity of cropland (Barnett & Adger, 2007; Hendrix & Glaer, 2007). As climate-related displacement and migration trends continue to grow, poor societies in particular will be impacted by increased violent conflict in receiving areas as populations compete over resources (Homer-Dixon, 1994; Reuveny, 2007). As such, it is increasingly accepted amongst the scientific community that environmental change will result in greater migration and mobility (Martine & Schensul, 2013).

For centuries, migration has been a mechanism for coping with or adapting to environmental changes impacting vulnerable populations dependent on ecosystems for their livelihoods. Rural-urban migration, as a response to climate change, is an adaptation method to vulnerability and uncertainties, such as natural disasters or ecosystem degradation. The growing frequency and intensification of extreme weather events throughout the world are having an increasingly negative impact on agricultural production and reducing access to clean water, requiring greater populations to relocate. As the access to and the quality of natural resources that sustain livelihoods change due to climate variability, climate-related displacement and migration are anticipated to continue to escalate.

Although not a new adaptive response to climatic stress, migration is anticipated to increase in response to environmental degradation (Reuveny, 2007; Warner et al, 2009). In 2008, approximately 20 million persons were displaced due to climate-related disasters (Laczko & Aghazarm, 2009) and the International Organization for Migration estimates that the number of people forced to move by 2050 primarily as a result of climate change will range between 200 million and 1 billion (Tacoli, 2009). This population would be considered environmental migrants, which Warner et al (2009) defines as persons who leave their habitual homes due to changes (sudden or progressive) in the environment that adversely impact their living conditions. The populations who are and will be most vulnerable to environmental risk, however, are often those who are unable or unwilling to move (Martine & Schensul, 2013).

Rural-urban migration as a response to climate change is often viewed as an inability to adapt to environmental changes at a place of origin, but it can also be considered an adaptation method in itself (Martin, 2010). To some extent displacement and migration as a result of climate change may be prevented through the implementation of adaptation measures. Poorer countries, however, are predominantly underequipped to provide support for systematic adaptation, and migrating out of

environmentally degraded and agriculturally unsustainable regions is, therefore, a valid strategy for affected populations that are suffering increased stresses and shocks resulting from climate change (Black, Kniveton & Schmidt, 2011; Laczko & Aghazarm, 2009; Warner et al, 2009).

Rural-urban migration is not the sole response to climate change occurring in Tanzania. In the Kilimanjaro region specifically, households have been found to employ adaptation methods such as planting trees or switching to word-burning cooking stoves in lieu of open cooking fires (Holler, 2014). Adaptation efforts in the agricultural sector often focus on the development of new crop varieties, irrigation and soil and water conservation techniques, in order to reduce vulnerability to drought and mitigate soil degradation (Henry, Boyle & Lambin, 2003; Lobell et al, 2008; Tumbo et al., 2012). An example is adopting new varieties of maize, developed to be resilient to droughts and drying conditions, producing higher yields and more resistant to diseases and pests (Holler, 2014). New coffee varieties, fast growing crop varieties, roots crops and improved livestock breeds – including exotic cattle and poultry breeds- are also being adopted, along with pisciculture (Holler, 2014; Muthoni & Wangui, 2013). Such responses, however, were not found to be equally adopted among social and economic groups, as those most vulnerable to the impacts of climate change tended to lack the resource access and capacity to adopt the aforementioned adaptive measures; this reinforces prognoses that climate change will exacerbate the burdens of the poor and vulnerable (Holler, 2014; IPCC, 2007; Thornton et al., 2009).

In a study on internal migration in Tanzania, Ocello et al states that "impoverished people face a double set of risks: they are unable to move away from environmental threats, and their lack of capital makes them especially vulnerable to environmental changes (2014, p. 8)." This study found that adverse environmental conditions brought on by climate change may discourage migration for some while at the same time foster population mobility for others. Factors for determining internal migration ranged from the type of environmental shock (such as droughts, floods or crop

diseases/pests) to the education level of individuals. For example, individuals with no education were found to have a higher propensity to migrate as well as those experiencing drought or severe water shortage; respondents who experienced crop disease or crop pests, along with those who had a primary educational attainment were less likely to migrate (Ocello et al., 2014).

Climate as a driver of migration in East Africa will continue to be an influence on communities and households as extreme weather events and conditions increase; however, the social and demographic impacts of climate vulnerability at this point are still not well understood (Martine & Schensul, 2013). Therefore, the importance of understanding climate change and sustainability is two-fold: (1) understanding how climate change acts as a driver of migration, of whom, and determining the feasibility of potential mitigation efforts in lessening the need for migration; and (2) looking at how we sustainably build and plan cities, as rural-urban migration substantially impacts urbanization and the resulting development.

Migration patterns may be a metric for a population's vulnerability or resilience (or rather, their capability to cope or adapt) to environmental changes (Martin, 2010). The breakdown of ecosystem-dependent livelihoods and increase of natural disasters as a result of climate change are likely to become increasingly significant drivers of migration unless measures are taken to assist vulnerable populations in building climate-resilient livelihoods. (Warner et al, 2009). The enormous range of variability and responses to the impacts of climate change, however, necessitates a regional and localized approach to assessing both risk and adaptive capacity (Moore et al., 2011; Thornton et al., 2009).

2.3 **Livelihoods as a Driver of Rural-Urban Migration**

As climate change increasingly proves detrimental to rural livelihoods and household food security, migration and mobility are increasingly key to livelihood strategies, which are becoming progressively diverse in sub-Saharan Africa (Tacoli & Mabala, 2010). Most rural families have multiple sources of income, combining farming with non-farm activities, and the least vulnerable households are those that are better able to extent into more favorable labor markets (Bah et al., 2003; Ellis, 2000; Martine & Schensul, 2013). Ellis (2000) lists the primary determinants of livelihood diversification as seasonality, risk, labor markets, credit markets, asset strategies, and coping behavior (p. 299). A livelihood, as defined by Muthoni and Wangui (2013) encompasses the regularly undertaken activities of individuals or households in order to maintain their standard of living. Livelihood strategies, which are largely determined based on the ability to access assets, are governed largely by social relations and institutions, specifically kinship and social networks, gender relations within the household, and property transfer customs (Ellis, 2000). Frequently, household strategies for diversifying livelihoods and procuring alternative income are achieved through migration (Ellis, 2000; Paavola, 2008; Tacoli & Mabala, 2010).

One of the main drivers of rural-urban migration is the perceived ability to earn more income in urban areas. Conversely, population shifts from rural to urban areas is often believed to contribute to both unemployment in urban areas and a loss of potential agricultural production in rural areas (Beauchemin & Bocquier, 2004). Tanzania is rapidly urbanizing and according to Msigwa and Mbongo (2013), in 2006, almost 67% of the Tanzanian population migrated from rural to urban areas (p. 33), the majority of whom were low-skilled, young adults. Notable migration patterns from rural areas of northern Tanzania to urban centers, specifically Dar es Salaam. Of those who are migrating, there is now a greater share of female migrants, although women still face many cultural constraints

pertaining to gender norms and limitations for employment (Beegle, De Weerdt & Dercon, 2011; Msigwa & Mbongo, 2013).

Despite the significant role played by women across SSA in both small scale farming and small scale entrepreneurship, women have been marginalize and denied equitable access to the resources necessary to ensuring they are effective in their culturally prescribed roles (Khasiani & Okoth-Okombo, 1995). As a result, women are increasingly migrating as a strategy to improve their access to resources (Khasiani & Okoth-Okombo, 1995).

There are many factors influencing the few employment opportunities available to migrant and non-migrant women in urban areas in SSA, such as Dar es Salaam (Khasiani & Okoth-Okombo, 1995). Predominantly, women living in urban areas are finding employment in the informal sector or formal sector activities such as low income retailing, petty trading, or participating in the service sector (Khasiani & Okoth-Okombo, 1995). However, there remains a gap in knowledge surrounding women's marginalized position regarding employment; coming to better understand their participation in wage employment and self-employment in urban areas needs to be understood if efforts to emancipate women are to be successful (Khasiani & Okoth-Okombo, 1995).

2.4 **Female Rural-Urban Migration**

With the increasing number of young people migrating in sub-Saharan Africa over the past twenty years, there is a growing number of women migrating (Adepoju, 2000; Bah et al., 2003; Khasiani & Okoth-Okombo, 1995; Tacoli & Mabala, 2010). Historically, migrant populations from northern Tanzania to Dar es Salaam have consisted almost exclusively of males, seeking economic opportunity to support their families; however, increasingly women are also migrating in order to seek out economic opportunity (Khasiani & Okoth-Okombo, 1995). Women are seeking employment outside of their communities of origin as a result of their few prospects at home due to household division of labor and inability to access and own resources (such as land) (Tacoli, & Mabala, 2010). While women tend to migrate farther from their home communities than men, they also remit significantly higher proportions of their income back to their families than men who migrate (Bah et al., 2003; Tacoli & Mabala, 2010).

Researching female rural-urban migration is the study of the factors which cause and perpetuate poverty and gender inequality, as well as the examination of solutions which empower women to "break the cycle of having less food, being powerless and being physically unhealthy (Hadley & Patil, 2006; Hyder et al., 2007, p. 333)." Khasiani and Okoth-Okombo (1995) state that development cannot fully occur if women remain trapped in poverty, since half the population is excluded from the process. Tanzania is ranked 119 out of 186 countries on the United Nations Development Program (UNDP) gender inequality index, which measures inequality between women and men in empowerment, reproductive health and the labor market[3]. As such, it is vital to examine the role of women and girls within households and whether they have an adult status within the household's social sphere (Rao, 2005). The lack of being granted such status generally takes decisions

[3] Retrieved March 3, 2015 from http://hdr.undp.org/en/content/table-4-gender-inequality-index

(such as health- care, education and fiscal decisions) or the ability to make said decisions out of the control of the woman to whom they pertain, which may have serious implications for her well-being; therefore, both a gender and a generational lens of analysis ought to be employed when regarding pushes factors of migration in order to better understand resource allocation and decision-making abilities at the household level and how it impacts the well-being of women in Tanzania (Tacoli & Mabala, 2010).

Katapa (2006) defines the head of household as the person in a household who is considered by all members of the household to be the leader. Due to numerous factors – such as deaths of males in civil wars and conflicts, male migration and increased rate in divorce – female-headed households are increasing in Tanzania and many African countries (Katapa, 2006). A woman's participation in decision making – such as household finances, land use and timing of agricultural acitivities – has implications for her use of time, personal welfare, her household welfare, and is indicative of her status within the community and within her household (Khasiani & Okoth-Okombo, 1995). Women who are household heads are still largely uneducated, and in rural areas of Tanzania, female-headed households were found to be poorer than male-headed households (Smith & Stevens, 1988). In general, female-headed households were found to: be smaller; have smaller harvests consisting of lower value subsistence crops; not have enough food to eat; not own a car or a radio; and have lower incomes from employment (Katapa, 2006; Smith & Stevens, 1988). It's not uncommon, however, for women who migrate to become heads of households (Khasiani & Okoth-Okombo, 1995).

In many African societies, women's self-actualization and autonomy is defined by way of social and political structures that limit their access to credit, land and modes of production (Adepoju, 2000). An example of how culture directly influences both resources allocation and well-being is that often food is served first to the males in the household, after which the women are allowed to eat; in addition

to eating first, men often receive higher quality food products; the implications of this pattern of food distribution may be that of long-term health and nutritional disadvantages for women and female children (Hyder et al., 2007). Denying women access to these basic resources often begins at the household level and is determined by gender and generational decision-making power within family structures and household units (Tacoli, & Mabala, 2010). Land, for example, is a significant societal element with ramifications for poverty and class formation, as well as for food security and nutrition on a community level (Bah et al., 2003; Rao, 2005; Tacoli & Mabala, 2010).

Women, account for 75% of the agricultural workforce in rural areas of Tanzania,[4] are the backbone of small scale farming (Khasiani & Okoth-Okombo, 1995). Although women have legally been able to own land since 1999, traditionally, women are excluded from land inheritance or ownership and land passes exclusively to male heirs, with women only given tenant rights through kinship and marriage (Khasiani & Okoth-Okombo, 1995). In communities heavily dependent on subsistence agriculture (as is predominant in rural Tanzania), this becomes a significant source of vulnerability for women and has ramifications for women's status and poverty (Khasiani & Okoth-Okombo, 1995; Rao, 2005; Smith & Stevens, 1988).

Women's rights to land ownership and their ability to access – whether by purchasing or through inheritance – land is a significant societal element that goes beyond that of gender equality, but has inherent ramifications for poverty and class formation, and food security and nutrition on a community level (Bah et al., 2003; Rao, 2005; Tacoli & Mabala, 2010). Despite that women provide the majority of the labor for agriculture, even female-headed households will typically merely occupy land with the permission of male relatives (often without assurance that the house and land will not be reclaimed by a male heir at any time) instead of owning it outright (Rao, 2005; Smith & Stevens,

[4] Interview conducted with specialists in the National Food Security Department of the Tanzanian Ministry of Agriculture, Food Security & Cooperatives on August 12, 2014.

1988). The challenges associated with the lack of enforcement of women's property rights are augmented by the inability of women to access credit and extension services at the same rate as men. These factors not conducive for food production and ultimately contribute to food insecurity (Rao, 2005; Smith & Stevens, 1988).

Although women play important roles in agriculture they do not necessarily have the same access to technologies as men, including agricultural inputs (such as fertilizers), irrigation programs and extension services (Njuki et al., 2013; Smith & Stevens, 1988). Such technology is essential to intensify production and yields and the inability to access it results in dramatic income disparities between male and female agriculturalist. Such an example is made apparent through interviews conducted by Smith and Stevens (1988) where male farmers reported an average income of 39,000 Tanzanian shillings, compared to the average income of 17,000 Tanzanian shillings reported by female-headed households.

As women provide most of the farm family labor as well as labor for other domestic activities, providing women with greater access to credit, mechanized labor and more efficient transportation options would greatly reduce the amount of time required for women to spend on farming activities as well as improve economic opportunities for women (Hyder et al., 2007; Khasiani & Okoth-Okombo, 1995). Currently, however, their vulnerability as a result of their inability to access such resources acts as a driver of female rural-urban migration, pushing women to urban areas where livelihoods aren't inherently depend on land and agriculture. In urban areas, however, more women are participating in wage labor force, both in the private sector and in the public sector, and a large number are self-employed (Khasiani & Okoth-Okombo, 1995). The earning levels of women in urban areas is higher than that of non-migrant rural women (Khasiani & Okoth-Okombo, 1995).

Indicators pertaining to the status of women include distance to access to piped water and the type of domestic fuel energy available to the household (Khasiani & Okoth-Okombo, 1995). This is important since women manage water and fuel resources and their access to them reflect demands on their energy and time, physical effort, and factors into women's status and poverty (Khasiani & Okoth-Okombo, 1995). Women across rural sub-Saharan Africa – Tanzania included – are responsible for providing food for the household, which includes farming and cultivation, collecting firewood, fetching water and preparing meals (Hyder et al., 2007; Jacobi, Amend, & Kiango, 2000). Outside of meeting the needs of the household, it is not uncommon for women to participate in these activities as casual labor in order to increase household income, often to be able to pay for their children to attend school (Muthoni & Wangui, 2013). As the majority of this labor remains un-mechanized in Africa, these activities are very labor and time intensive. Furthermore, as resources become increasingly scarce, due to increasing droughts brought on by climate change, women often have to travel longer distances and devote greater allotments of time so securing resources, specifically household fuel and water. The time constraint required for women to fulfill their requisite labor and production activities creates a vicious cycle that perpetuates itself (Hyder et al., 2007). Additionally, women in SSA are responsible for other household and family duties, such as reproduction and maintenance (Khasiani & Okoth-Okombo, 1995).

The intensive labor burden for women not only causes physical and mental stress, but creates severe time constraints. This in turn perpetuates their inability to participate in community and household decision making processes, which impacts their daily lives and ultimately their ability to change the existing conditions of their lives (Eriksen et al., 2005; Hyder et al., 2007; Katapa, 2006). Currently, their workload is defined by society and it is men who are defining social norms and often there are social and cultural barriers that prevent male household members from participating in these tasks (Jacobi, Amend, & Kiango, 2000). Correspondingly, there remains social restrictions pertaining

to the economic activities in which women are able to participate. When women do engage in casual labor, such as bundling and selling firewood, they are not necessarily compensated fairly in proportion to the hardship of their work or equally to men doing the same or similar tasks, all of which contributes to women being more impoverished than men (Erisen et al., 2005; Hyder et al., 2007; Katapa, 2006; Rao, 2005).

The aforementioned disadvantages and constrained access to resources are simultaneously compounded and reinforced by the fact that the majority of women have a lower level of formal, primary education and almost none of them have formal agricultural training (Eriksen et al., 2005; Smith & Stevens, 1988). Educational attainment improves the status of women. It assists in improving their health and that of their families and allows for greater economic opportunities, both of which reduce women's chances of poverty (Khasiani & Okoth-Okombo, 1995). Delaying marriage is also significant for women's well-being, as marriage at a young age exposes women to longer reproductive spans, which ultimately increases risk of poor health for women along with reducing their opportunities for higher education and employment activities outside the home (Khasiani & Okoth-Okombo, 1995). Ensuring that girls and women have equal access to education and training has proven to significantly, positively impact food security, health, economic status and employment opportunities not only for the women themselves but for their children as well (Hyder et al., 2007; Rao, 2005).

These inequalities are attributed as drivers of female rural-urban migration in Tanzania, pushing young women leaving their communities of origin to seek out economic opportunities that are not directly dependent on landownership (Tacoli & Mabala, 2010). Landlessness and near landlessness are significant drivers of rural to urban migration (Khasiani & Okoth-Okombo, 1995). In northern Tanzania, a driver of female migration has been attributed to the expectation that

daughters will contribute unpaid labor to the family farm without the ability to inherit it; thus migration is viewed as an opportunity to break the cycle of dependency on men – first on their fathers and then on their husbands (Tacoli, & Mabala, 2010).

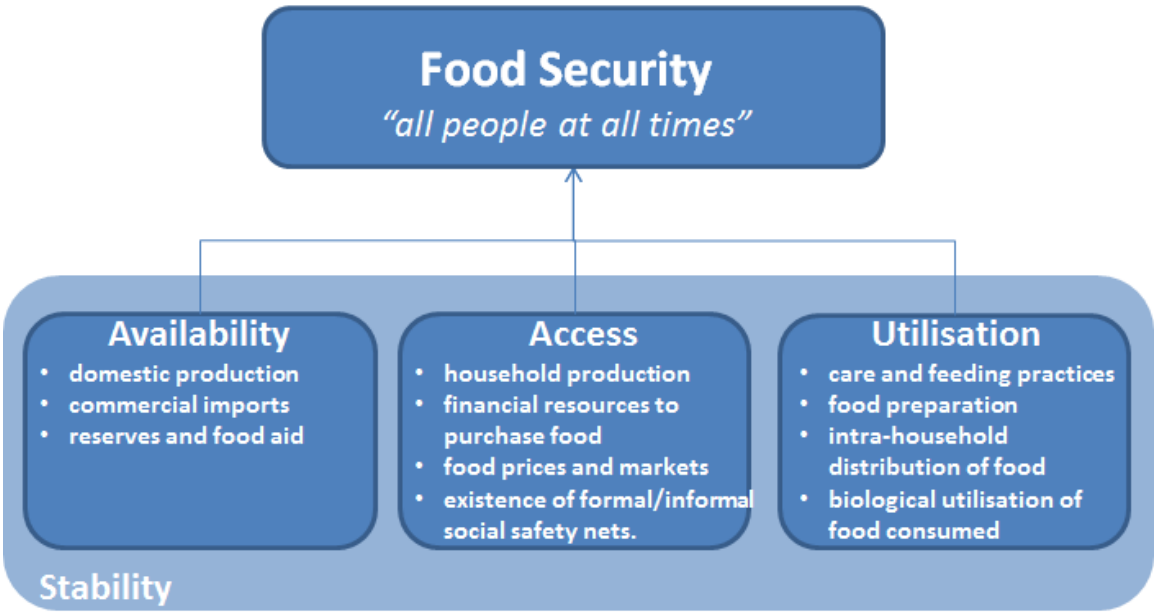
Due to the additional challenges that women in Tanzania face, this research is seeking to determine if rural-urban migration is in fact improving their wellbeing, specifically the food security in female-headed households. Once women arrive in urban centers, however, they continue to face discrimination, an example being that female employment in many African countries tends to remain in certain low-income sectors, despite the fact that increasingly female rural-urban migrants are educated and seek higher income positions appropriate for their educational attainment (Gould, 2008).

There continues to be significant gaps in the data examining the relationship between gender, migration and climate change. As populations continue to move to urban centers, better understanding of the interrelationships of these phenomena will be essential to utilize sustainable development practices and policies and achieve better equity and social well-being.

2.5 Food Security

Food security is defined by both the World Bank and the FAO as physical and economic access by all people, at all times, to adequate, safe and nutritious food that meets the dietary needs for an active and healthy lifestyle. A household is considered to be food secure when it has access to the food needed for a healthy life for all its members and when it is not at undue risk of losing such access (Armar-Klemesu, 2000; Hadley & Patil, 2006; Leyna et al., 2008). Figure 3 below developed by the FAO demonstrates the four key factors on which food security is dependent.

Figure 3: Key Factors of Food Security



Source: WFP, 2013, p. 8

The 1948 Universal Declaration of Human Rights and the 1966 International Covenant of Economic, Social and Cultural Rights established the right to food and freedom from hunger became characterized as a fundamental human right and the primary economic right of human beings (Armar-

Klemesu, 2000).he problems of hunger and food insecurity are embedded in social systems as the issue pertains to *access* to food more than its availability (Armar-Klemesu, 2000; Jacobi, Amend, & Kiango, 2000). Households with insufficient food are those with the inability to access food through legal and customary means, and generally show significant poverty indicators of low income, low educational attainment and unemployment. Additionally, female-headed households and households with children tend to suffer more from issues of food insecurity (Leyna et al., 2008; Turner & Robbins., 2008; WFP, 2013). Female-headed households comprised 26% of all Tanzanian households in 2010-2011. Female-headed households are found to be slightly more prone to food insecurity (11.4%) than male-headed households (7.2%) (WFP, 2013).

Food insecurity is intrinsically linked to poverty, and measures that are frequently employed when studying food security are that of the poverty line and the food poverty line. The poverty line is the value of standard consumption "for an average adult to live satisfactorily (WFP, 2013, p. 6);" the food poverty line is the consumption value "required to purchase the minimum value of food, given the household's number of adult equivalents based on a daily intake of 2,200 kcals per adult (WFP, 2013, p. 6)." In the year 2011, the poverty line in Tanzania was 23,933 Tanzanian Shillings (TSH) per month, and the food poverty line was 18,719 TSH. In that same year, two-thirds of Tanzania's food insecure population was below the poverty line and 47% were below the food poverty line, the majority of whom lived in rural areas (WFP, 2013). The limitations with national and regional statistics and surveys, however, is that they do not always capture local disparities, particularly those which act as drivers of rural-urban migration.

The main food security indicator used by the United Nations World Food Program (WFP), FAO and the International Food Policy Research Institute (IFPRI) is poor dietary intake (PDI), which identifies households that are highly deficient in calorie consumption and have low amounts of

diversity in their diet. Additional indicators utilized include coping strategies and food energy deficiency. Table 2 gives a detailed description of indicators used by the WFP in measuring food security, including food security in Tanzania.

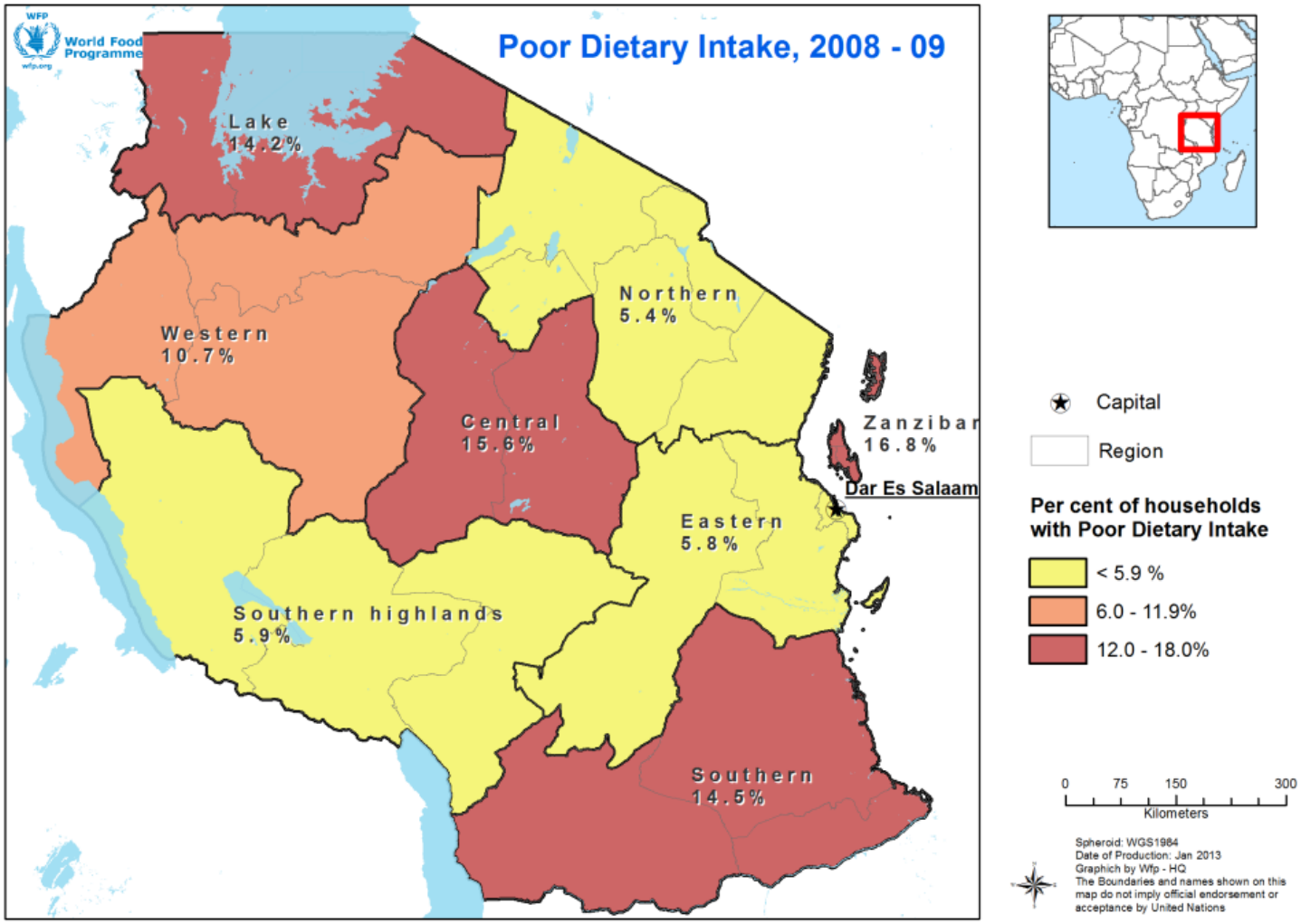
Table 2: Key Indicators of Food Insecurity

Key Indicators	
Household Indicator	**Description**
Food Energy Deficient	Consumption is less than the recommended daily intake of calories (based on age-sex composition); *highly food energy deficient* consist of a deficit of more than 300 calories daily per household member.
Low Diet Diversity	Foods are consumed from four or fewer of the seven food groups, which consist of the following: (1) cereals; (2) legumes; (3) dairy products; (4) oils and fats; (5) meat, fish, eggs; (6) fruits; and (7) vegetables.
Poor Dietary Intake	Households that lack sufficient calorie quantity and variety of diet.
Nutrition Indicators	Stunting, wasting and underweight indicators assess the nutrition of 0-5 year olds in Tanzania based on the Demographic and Health Surveys.
Very High Food Expenditure Share	Households with 75% or more of total expenditures dedicated to food, accounting for the cash-value of foods produced at home.
Reduced Coping Strategies Index	Includes: (1) switching consumption to less preferred foods; (2) limiting portion size; (3) reducing the number of daily meals; (4) restricting consumption by adults in order for small children to eat; (5) relying on help from a friend or relative.

Source: WFP, 2013, p. 14

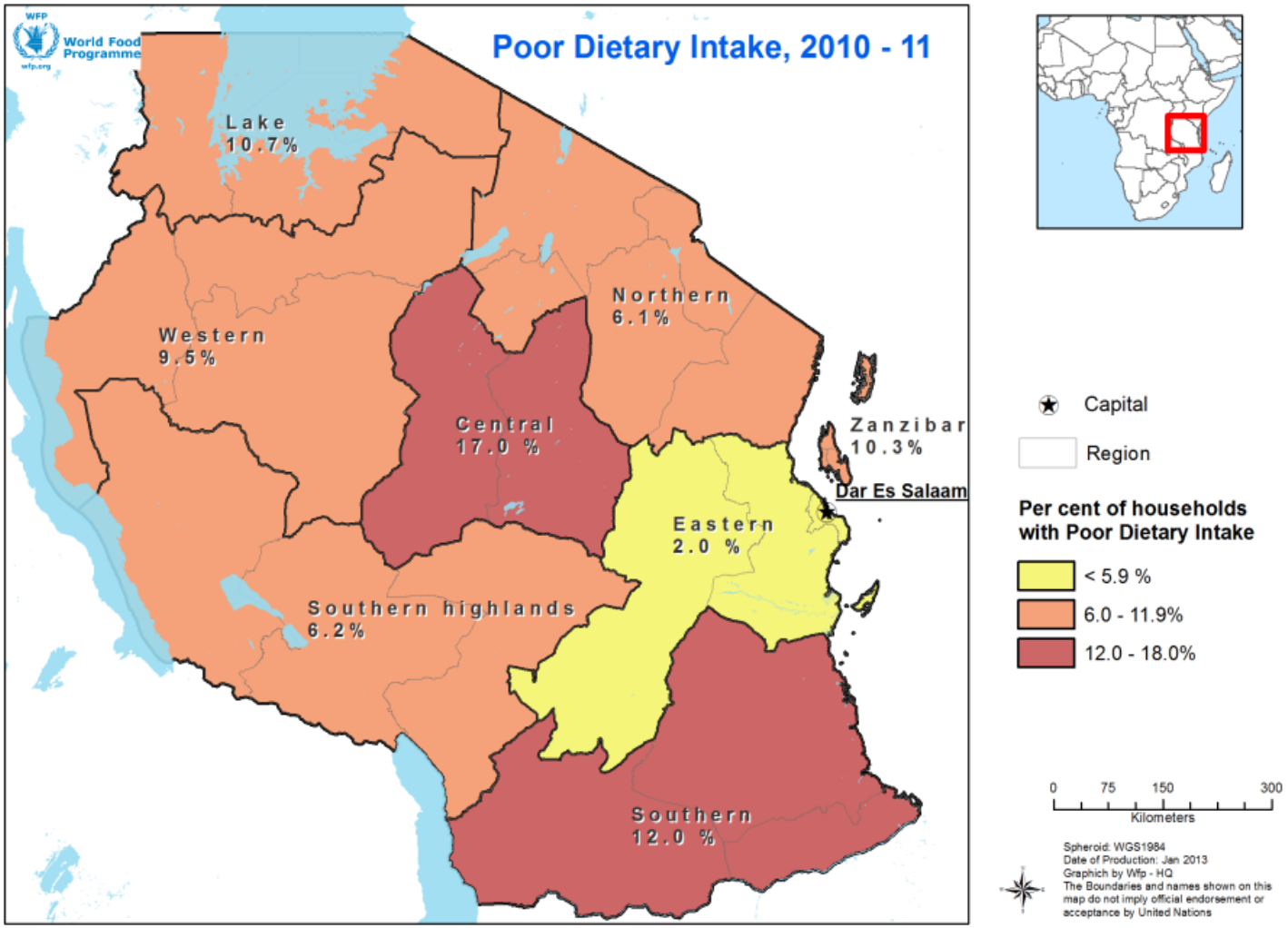
Food security gains are not matching those of national economic gains in Tanzania and Figures 4 and 5 show the modest reduction in households with PDI between the 2008-2009 and 2010-2011 (WFP, 2013). The percentage of households with PDI grew by 0.7% in the northern region depicted in the map, which is where Kilimanjaro is located; however, the eastern region, which contains the city of Dar es Salaam, saw a reduction of households with PDI, dropping from 5.8% in 2008-2009 to only 2.0% in 2010-2011. In 2010-2011, approximately 8% of Tanzanian households (or 730,000 households) were considered food insecure or vulnerable to food insecurity; 43% were not consuming enough calories; and 2% were chronically food insecure (WFP, 2013). In the year 2013, 87% of Tanzanian households with PDI were found to be in rural areas and 66% were below the poverty line; 15% of households in Tanzania with household heads who had not attended school experienced *PDI*; and of *PDI* households in Tanzania, 82% has the head of the household working in farming and 8% had unemployed household heads (WFP, 2013). Responses to food insecurity include changes in diet, reducing food intake, selling off assets, seeking additional work, reducing the number of household dependents and migration (Armar-Klemesu, 2000; Hadley & Patil, 2006).

Figure 4: Tanzania PDI 2008-09



Source: WFP, 2013, p. 13

Figure 5: Tanzania PDI 2010-11



Source: WFP, 2013, p. 13

Tanzania is predominantly in the subsistence/small scale farming stage of land use patterns, which has implications for its national food security. DeFries, Asner and Foley (2006) demonstrate that the parallels of land use transitions with diet transitions as a reflection of changes in livelihoods, sources of food and residential patterns. The structural and societal evolution that transpired from agrarian economies to those that are service oriented originated in the hunting/gathering food stage and transitioned throughout the evolution of civilization to modern diets high in fats, meats and high consumption of processed foods as a result of the multi-variable intersection of living standards, diets, health and resource consumption (DeFries, Asner & Foley, 2010; Webb, 2010). Ultimately Tanzania's ability to transition from its economic dependence on subsistence agriculture to a more diversified economy will not only have a profound effect on national food security, but is interconnected to a myriad of other societal implications as well, including fertility rates, diet patterns, epidemiology, energy consumption and urbanization.

In rural areas, capacities of households to cope with food insecurity is decreasing due to increasing vulnerabilities, an example being the increase of droughts as a result from climate change, (Webb, 2010). Table 3 illustrates the causes and duration of food shortages experienced across Tanzania in 2010-2011. The diminishing ability of rural households to sustain livelihoods often acts as a push for more vulnerable groups (such as women) to migrate to urban areas.

Table 3: Food Shortages experienced in Tanzania, 2010-2011

Food shortages - duration and causes, by area, 2010-11										
			Main cause of food shortages							
Area	% experiencing food shortage in past year	Months with food shortage	Droughts, poor rain	Crop pests	Small land size	Lack of farm inputs	Expensive food	No money	Other	Total
Tanzania	20%	3.5	38%	3%	8%	11%	12.2%	14%	13.4%	100%
Mainland	21%	3.5	38%	3%	8%	11%	12.2%	14%	13.6%	100%
Dar es Salam	17%	4.2	4%	1%	0%	3%	24.7%	42%	25.5%	100%
Bimodal	23%	3.5	40%	3%	8%	6%	10%	17%	15%	100%
rural	24%	3.4	51%	3%	10%	7%	7%	9%	13%	100%
urban	20%	3.7	15%	2%	5%	4%	18%	35%	22%	100%
Unimodal	17%	3.5	35%	4%	7%	18%	14%	11%	11%	100%
rural	18%	3.4	37%	5%	9%	18%	13%	9%	9%	100%
urban	16%	4.0	24%	2%	0%	15%	22%	18%	19%	100%
Zanzibar	7%	2.8	72%	7%	7%	3%	2.0%	9%	0.0%	100%

Source: WFP, 2013, p. 23

2.6 **Urbanization**

Kasarda and Crenshaw (1991) define urbanization as "growth in the proportion of the population in urban areas (p. 468)." The Tanzanian National Bureau of Statistics (NBS) (2015) frames urbanization as follows:

> Urbanization is the increasing number of people that live in urban areas and is largely the result of natural increase of population, migration and reclassification of neighboring rural areas into urban areas. It may also be the result of physical growth of urban areas which may be horizontal or vertical as it is the case in more urbanized countries. Moreover, urbanization is closely related to modernization and industrialization and social process such as rationalization. Hence the term urbanization can represent the level of urban development relative to overall population, or it can represent the rate at which the urban proportion is increasing. Besides this urbanization is not merely a modern process but a rapid and historic transformation of society from predominantly rural to an urban society (p. 34).

From an economic perspective, urbanization, as portrayed by Henderson (2003), is a developmental shift from agriculture to a modern manufacturing sector. This shift is also known as structural transformation, or the process through which the relative share of agriculture in a country's economy diminishes while still growing in relative numbers. In this process, the percentage of the population living off agriculture lessens and labor is transferred from agriculture to nonagricultural sectors (Collier & Dercon, 2014; Johnston and Mellor, 1961). The resulting labor shortage in rural areas due to rural-urban migration is believed to ultimately increase rural wages (Khasiani & Okoth-Okombo, 1995). For this to occur, however, there must be an initial surplus of rural labor performing below marginal productivity. The surplus labor force is increasingly pulled to urban centers by higher salaries and better living conditions (Adepoju, 2008; Lipton, 1980).

Structural transformation is considered to be a necessary condition of the development process, both a cause and effect of cumulative and self-sustained economic growth (Barrett et al, 2010; Johnston and Mellow, 1961). Tanzania, with its high rural population and high percentage of the labor

force still in agriculture, exactly fits Johnston and Mellor's (1961) description of the requisite pre-existing conditions for a country prior to entering into structural transformation:

> Typically, some 40 to 60 per cent of the national income is produced in agriculture and some 50 to 80 per cent of the labor force is engaged in agricultural production. Although large quantities of resources – chiefly land and labor – are committed to agriculture, they are being used at very low levels of productivity (p. 566).

Under colonial rule, population mobility across East Africa was restricted and the urban population in Tanzania remained low; upon gaining independence, however, significant rural-urban migration began to occur and, as a result, urban populations grew rapidly (Khasiani & Okoth-Okombo, 1995; NBS, 2015). This is a social trend that has continued. Between the years 1967 and 2012, Tanzania's urban population almost quadrupled (NBS, 2015). The country's urban growth rate ranges from 4%-10.8% (NBS, 2015). Tanzania's urbanization rate was estimated to be around 35% in the year 2012, and predicted to reach 50% by the year 2030 (United Republic of Tanzania, 2012). Martine and Schensul (2013) anticipate significant consequences for poverty and vulnerability in developing countries as a result of the growing proportion of the population living in and moving to urban areas.

Although natural growth and reclassification also significantly impact urbanization rates, urbanization rates are cited predominantly when analyzing how migrants influence and shape urban areas and fit into the urban economy. The NBS (2015) states that since the year 2008, for the first time in history, more than half of the world's population now lives in cities and towns. The number of people living in urban areas worldwide is predicted to reach five (5) billion by the year 2030, with highly concentrated urban growth occurring in Africa and Asia (NBS, 2015.) Since the 1990s, although SSA was the least densely populated region of the world, it has had the fastest growth rate, with urban populations doubling approximately every fifteen (15) years; by the year 2025, the United Nations

predicts that half of the population of SSA will live in an urban area, and that the percentage is anticipated to continue to increase (Adepoju, 2008; Bilsborrow, 1998; Keiser et al, 2004; Zuberi et al, 2003).

East Africa in particular is experiencing rapid urban population growth (Bilsborrow, 1998). The current urban population on Tanzania's mainland is more than 12.7 million (NBS, 2015). Between the years 1988 – 2002, the percent of Tanzania's mainland population living in urban areas grew by 38.5%, and between the years 2002 – 2012 it grew another 22.4%, although levels of urbanization differ greatly between regions (NBS, 2015). Table 4 displays growth in urban population in Tanzania between the years 1967 and 2012. While Dar es Salaam has the highest level of urbanization in the country (100%), six other regions in the country have an urbanization level above 20% - these regions are Kilimanjaro, Mtwara, Ruvuma, Rukwa, Njombe and Kusini Pemba (NBS, 2015).

Table 4: Urban Population in Tanzania: years 1967, 1978, 1988, 2002 and 2012

Year	Total Population	Urban Population	Percent Urban	Urban Growth Rate
1967	12,313,469	786,567	6.4%	
1978	17,512,611	2,412,902	13.8%	10.2
1988	23,095,882	4,247,272	18.4%	5.7
2002	34,443,603	7,943,561	23.1%	4.5
2012	44,928,923	13,305,004	29.6%	5.2

Source: NBS, 2015

Urbanization has cost-savings benefits such as agglomeration and economies of scale and proximity, making cities more efficient in production that smaller communities, which ultimately results in higher incomes in urban areas (Beauchemin & Bocquier, 2004; Bilsborrow, 1998). Yet the attraction to urban areas is not exclusively economic, but pertains to the quality of life differentials at

large that remain between urban and rural areas in developing countries (Bilsborrow, 1998). Although two hundred years ago, living conditions – specifically pertaining to health – were worse in cities than rural areas, contemporary cities have greater access to basic services (such as food, electricity, safe drinking water and sanitation); better education and health services; greater availability of recreation and entertainment; and greater employment opportunities (Bilsborrow, 1998). The high concentration of people within cities fosters an ideal environment for generating ideas and innovation (Bilsborrow, 1998). The concentration of people not only generates information and knowledge, but necessitates quality infrastructure and services.

While the growth of cities has been demonstrated to contribute to overall economic growth within countries while simultaneously improving the quality of life of its inhabitants (Bilsborrow, 1998), there are multiple perceived stressors attributed to contributing to urbanization, an example being the additional costs such for physical and social infrastructure within urban centers. Urban areas are highly vulnerable to the effects of climate change, due to the following: high concentration of people, reliance on resources from outside their geographical boundaries; the often inadequate provision of water infrastructure, including sanitation and drainage; and other additional environmental challenges, such as solid waste management, air pollution and water pollution (Martine & Schensul, 2013). Other issues attributed to rapid urbanization include unemployment, underemployment and poverty; housing shortages; urban decay and overburdened infrastructure; epidemiological problems, and other social and economic development problems (Arthur, 1991; Khasiani & Okoth-Okombo, 1995). Frequently the rapid rate of urbanization has resulted in the poor residing in squatter settlements or slums that tend to be overcrowded, dangerous, polluted and lacking basic services and infrastructure (NBS, 2015). Such urban problems are often ascribed to migrants, who are frequently perceived as augmenting the aforementioned stressors. Bilsborrow (1998) argues

against this, due to the high proportion migrants who are willing to work for low wages, claiming the importance of migrants' contribution to a city's economic base.

Despite urban centers already generating over half of Africa's gross domestic product (Beauchemin & Bocquier, 2004), many of Africa's cities are struggling to keep up with the pace and the extent of urbanization (Keiser et al, 2004). The growing proportions of the world's population are concentrated in urban areas is changing consumption patterns and demands for natural resources and environmental services (Dietz et al., 2003; McGranahan & Satterthwaite, 2003). The labor force in SSA is currently growing at 2.7%, which means that approximately 7.5 million new jobs are needed to stabilize employment in urban areas (Adepoju, 2000). A response to this challenge is that increasing homes, neighborhoods, jobs and incomes in Africa are created outside of the government and formal markets (Jacobi, Amend & Kiango, 2000; Kates & Dasgupta, 2007; McGranahan & Satterthwaite, 2003).

From the year 2002 – 2012, Tanzania has undergone rapid urbanization at a rate ranging from 4.7% - 10.8%, due to natural population increase, migration and reclassification of areas from rural to urban (NBS, 2015). This urbanization, however, has not been evenly distributed across the country, as only about seven (7) out of the 169 localities classified as urban account for approximately 50% of the country's urban population (NBS, 2015). Dar es Salaam is Tanzania's largest city and contains more than 33% of Tanzania's urban population (NBS, 2015). The nation's more recent census data linked rural-urban migration as a significant contributor to the growth of the share of urban populations. The next four regions – after Dar es Salaam – regarding size of urban populations in both the 2002 and 2012 population and housing censuses are Mwanza, Arusha, Tanga and Kilimanjaro.

Dar es Salaam is Tanzania's largest city and accounts for approximately 35% of the country's urban population (Jacobi, Amend & Kiango, 2000). The city has a rich cultural history as a major port and trading center on the Indian Ocean, approximately 800 kilometers south of the equator, since its establishment in 1862 (Jacobi, Amend & Kiango, 2000). Dar es Salaam is seven times larger than Tanzania's next biggest city (Mwanza); it has a density of 3,133 persons per square kilometer and has become a main destination for rural-urban migration (NBS, 2015). The rapid population growth occurring in Dar es Salaam – largely due to rural-urban migration – has resulted in approximately 70% of the city's residents living in informal and unplanned settlements which lack access to basic infrastructure and social services, including tap water and sewage systems (Jacobi, Amend & Kiango, 2000). Migrants often tend to be concentrated in such settlements (Gould, 2008). Additionally, the unplanned settlements and structures that are being added to the urban landscape of Dar es Salaam due to its rapid urbanization are considered to contribute to the city's increased vulnerability to impacts of climate change (Awuor, Orindi & Adwera, 2008).

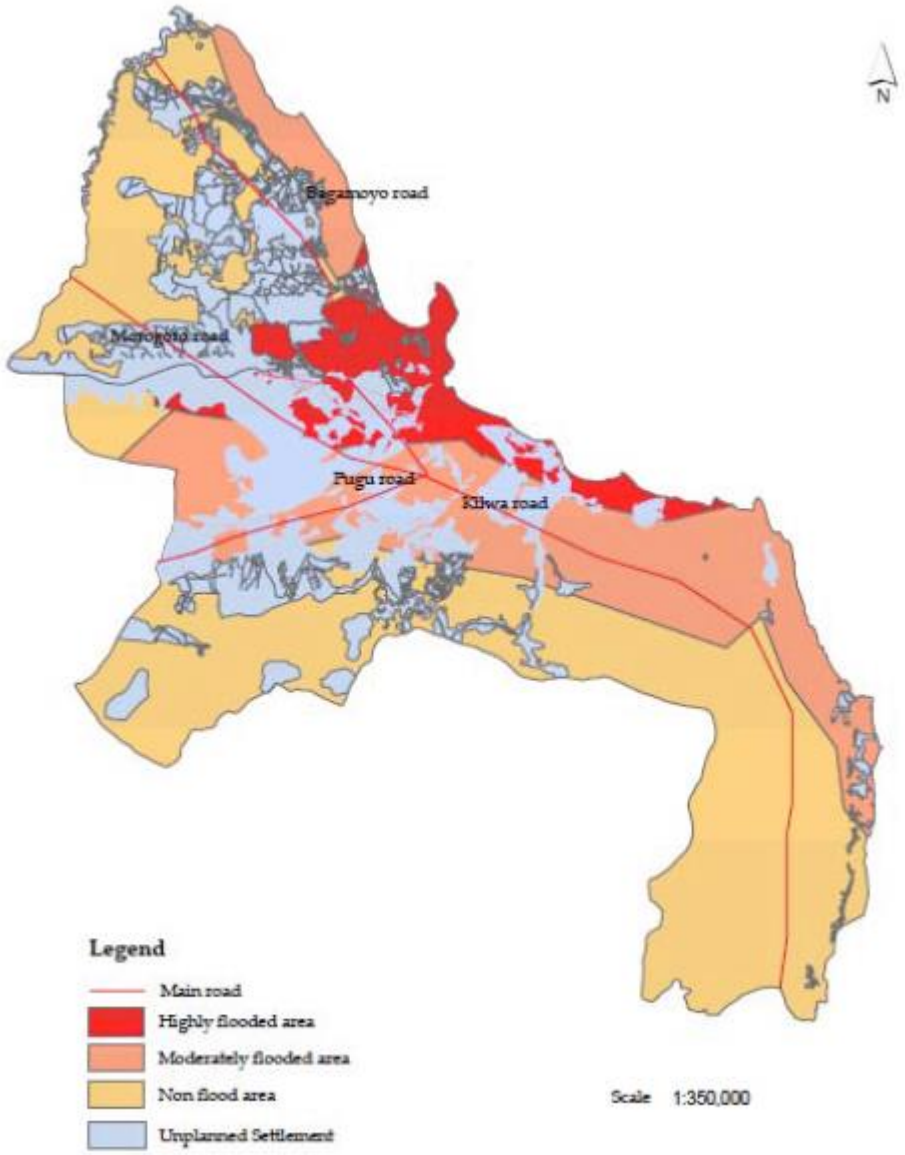
Urbanization and climate change vulnerability are often paired together because the high concentration of people and activities found in urban areas has the potential to expose larger numbers of people to hazards (Martine & Schensul, 2013). Yet when cities are planned and managed conscientiously – looking at land and housing distribution and quality, and if infrastructure and services are able to meet the needs of both the population and economies – the high concentration of people and activities has the potential to result in better protective infrastructure along with greater adaptive capacity for city dwellers (Martine & Schensul, 2013). Unfortunately, most urban centers of developing countries have high proportions of the population reside in unplanned settlements without provision for storm drainage, overcrowded housing and limited access to emergency services (Martine & Schensul, 2013). These are the areas and populations with highest vulnerability to extreme weather events (Martine & Schensul, 2013).

Urban sprawl is one of the issues arising out of the urbanization being experienced in Dar es Salaam, where currently approximately 70% of the city's population lives in unplanned settlements. This exacerbates the capacity of the city to provide basic infrastructure – including transportation and waste management (United Republic of Tanzania, 2012; Watkiss et al., 2011). Additionally, those who face such increased risk and exposure are predominantly poor; those who are the most economically vulnerable to the impacts of climate change typically resides in the unplanned areas of Dar es Salaam (Figure 6) (United Republic of Tanzania, 2012).

Half of the city' low-income population was found to be under the age of twenty and 20% of all households were headed by a woman (IFPRI, 2002). Despite high literacy rates, the schools are in poor physical condition and unemployment/under-employment is widespread (IFPRI, 2002). A small portion (15%) of the urban population engages in some form of urban agriculture to supplement food purchases and child malnutrition remains high, with approximately 40% of children under five experiencing stunting (IFPRI, 2002).

The rural origins of many of the residents on the periphery in Dar es Salaam may be a contributor to the city's urban agriculture, which has grown out of a response to demands for fresh foods (Jacobi, Amend & Kiango, 2000). Urban agriculture plays an important role in keeping household food costs down and bolstering food security, and in Tanzania two-thirds of urban families engage in urban farming practices (McGranahan & Satterthwaite; Smit & Nasr, 1992). As Tanzania continues to urbanize, increasingly those who are facing food insecurity will be living in urban areas, and urban agriculture provides opportunities for improved nutrition and health, increased entrepreneurship, and improved living environments (Armar-Klemesu, 2000; Smit & Nasr, 1992).

Figure 6: Vulnerability to flooding from climate change in Dar es Salaam



Source: Ardhi University, 2011

Other than the small portion of the population engaged in urban agriculture, food is not grown within the Dar es Salaam region and has to be imported from other regions across the country (Lynch, 1994). A significant challenge in this process is the amount of food waste that occurs in the process of transporting it to Dar es Salaam, as a result of both poor road infrastructure and lack of appropriate storage during transport[5]. According to Lynch (1994), food is transported to the city of Dar es Salaam and aggregated at Kariakoo Market, where it is then sold to wholesalers or retailers. Predominantly, food is purchased at wet markets across the city. The challenge of food waste is also prevalent at such markets, as they lack storage capabilities to prevent exposure to the open-air environment. A gradual increase of supermarkets has grown across Dar es Salaam, however, there remains a significant economic divide in access to such stores, where food and commodities are significantly more expensive than at the more prevalent, traditional markets[6].

As Dar es Salaam continues to rapidly urbanize, with proper planning, there is the opportunity to provide greater resources and quality of life for its residents; if not properly addressed, however, the result may instead be greater vulnerability and food insecurity for its residents.

[5] Interview conducted with specialists in the National Food Security Department of the Tanzanian Ministry of Agriculture, Food Security & Cooperatives on August 12, 2014.
[6] Interview conducted with specialists in the National Food Security Department of the Tanzanian Ministry of Agriculture, Food Security & Cooperatives on August 12, 2014.

2.7 **Conceptual Framework and Significance of Research**

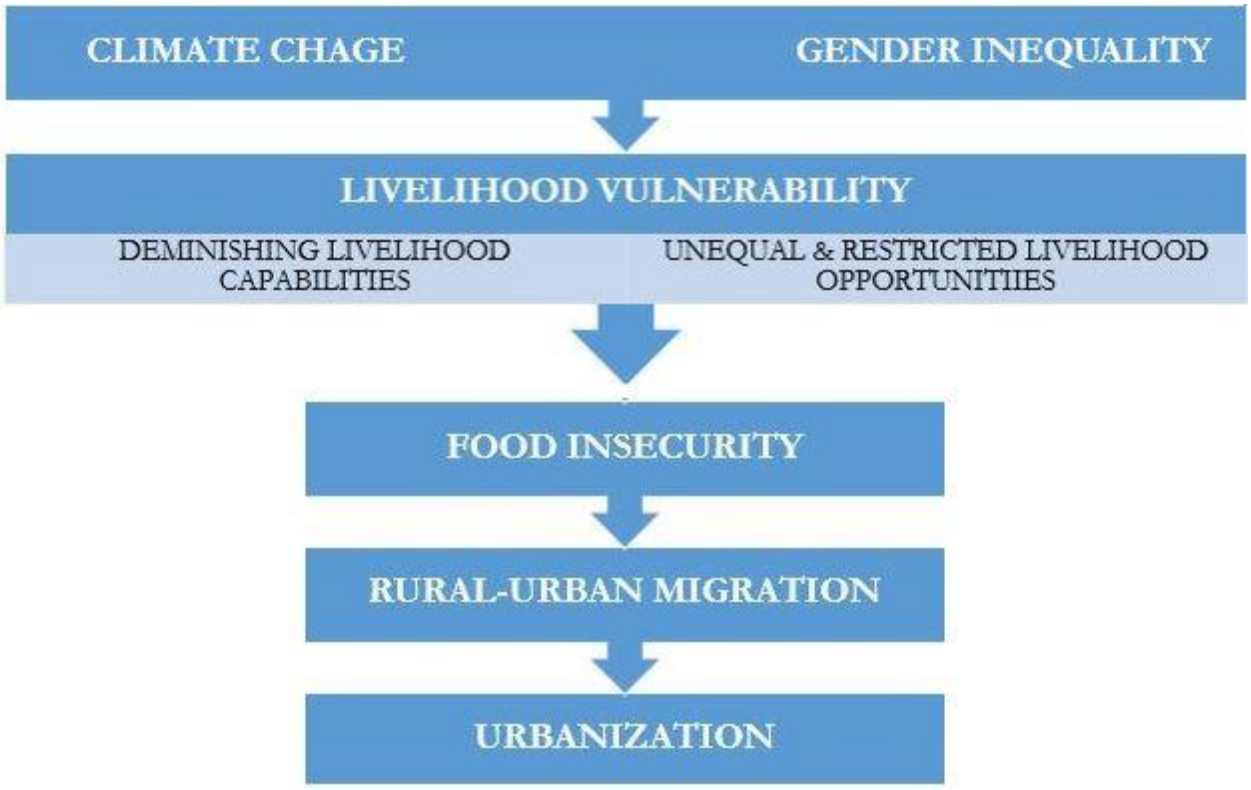
As demonstrated through the literature presented, there are multiple push factors causing female rural-urban migration in Tanzania. Since women in rural areas generally have less access to vital resources, they are often more prone to poverty and food insecurity. Rural economies remain predominantly agriculturally based and challenges surrounding land ownership and access to technology increase hardship for women. Additionally, climate change is altering agriculture and escalating vulnerability and food insecurity for those whose livelihoods are dependent on agriculture. In Tanzania, rural women are found to be some of the people most vulnerable to these shocks because they have limited diversification opportunities as they already face challenges in accessing public services, land, employment and markets (Paavola, 2008). These inequalities are attributed as drivers of female rural-urban migration in Tanzania, facilitated through social network connections, young women to leave their communities of origin to seek out economic opportunities in urban areas that are not directly dependent on landownership (Tacoli & Mabala, 2010).

At the same time, there are numerous pulls to urban areas, further motivating female rural-urban migration in Tanzania. Cities in and of themselves act as pull factors for migrants from rural areas, due to the multitude of opportunities and services they offer: jobs, entertainment and recreation, information and technology, education and health care services, and better infrastructure and amenities such as sanitation, electricity and safe drinking water (Bilsborrow, 1998). Foremost, however, tends to be the draw of higher wage employment. This is a method of diminishing risk by removing subsistence dependency from agriculturally based activities. In urban areas, however, social and educational restrictions remain pertaining to the economic activities in which women are able to participate, albeit less so than in rural areas. Women who migrate to urban areas still face discrimination, an example being that female employment in many African countries tends to remain

in certain low-income sectors, despite the fact that increasingly female rural-urban migrants are educated and seek higher income positions appropriate for their educational attainment (Gould, 2008).

Understanding the relationship between the influences leading to female rural-urban migration as discussed through the literature review is depicted in Figure 7 below and can be summarized as follows: the existing social order which foster gender inequality, coupled with growing land and environmental pressures as a result of climate change, creates uncertainty for livelihoods, which influences an individual and household's food security. Therefore, it is expected that when facing food insecurity, or the threat thereof, women in northern Tanzania are pushed to migrate to urban areas, specifically the city of Dar es Salaam, by a host of factors. This migration may often be facilitated through social networks. Finally, the rural-urban migration can contribute significantly to Tanzania's rapid urbanization rate.

Figure 7: Female Rural-Urban Migration Conceptual Framework



The consequences of rural-urban migration occurring from the northern region of Kilimanjaro to Dar es Salaam must be examined, as many of the factors attributed to driving rural-urban migration exist within urban settings as well. Food insecurity, for example, is not only a rural problem, as food insecurity exists in urban areas as well. Gender inequality also exists in both rural and urban settings, and women who migrate to Dar es Salaam may still face gender-based discrimination in employment. Another push for female rural-urban may be attributed to adapting to the impacts of climate change on rural livelihoods, it is important to remember that climate change is not limited to rural areas and can have severe consequences for urban areas as well. In fact, the greater concentration of people within urban areas has the potential to result in greater risk for natural disasters and extreme weather events.

Having examined the literature in depth, the author returns to the research questions driving this thesis and to be explore in greater depth in subsequent chapters:

1. Why are women and female-headed households moving to Dar es Salaam?
2. What is the role of climate change in their decision to migrate?
3. Is migration improving their well-being, specifically food security, and the well-being and food security of their households?

As urban planners, we are tasked with building just cities; cities that offer all residents equality, inclusion, opportunity, justice and access. As such, planners need to be forward thinking in order to make provisions for our cities to be prepared for extreme weather events due to climate change. We need to work to guide policy to ensure equitable opportunity for all who come to cities. Finally, we must ensure that food systems are developed and sustained in order to provide freedom from hunger as a fundamental human right.

3. STUDY AREA

This chapter provides an overview of Tanzania, specifically examining the northern region of Kilimanjaro and the city of Dar es Salaam. Understanding the sending region and the destination city provides context to the drivers and consequences, and push and pull factors, of rural-urban migration for women in Tanzania. This chapter describes the conditions of the Kilimanjaro region, which caused women to migrate, and the implications of rapid population growth for the city of Dar es Salaam, where the women settled.

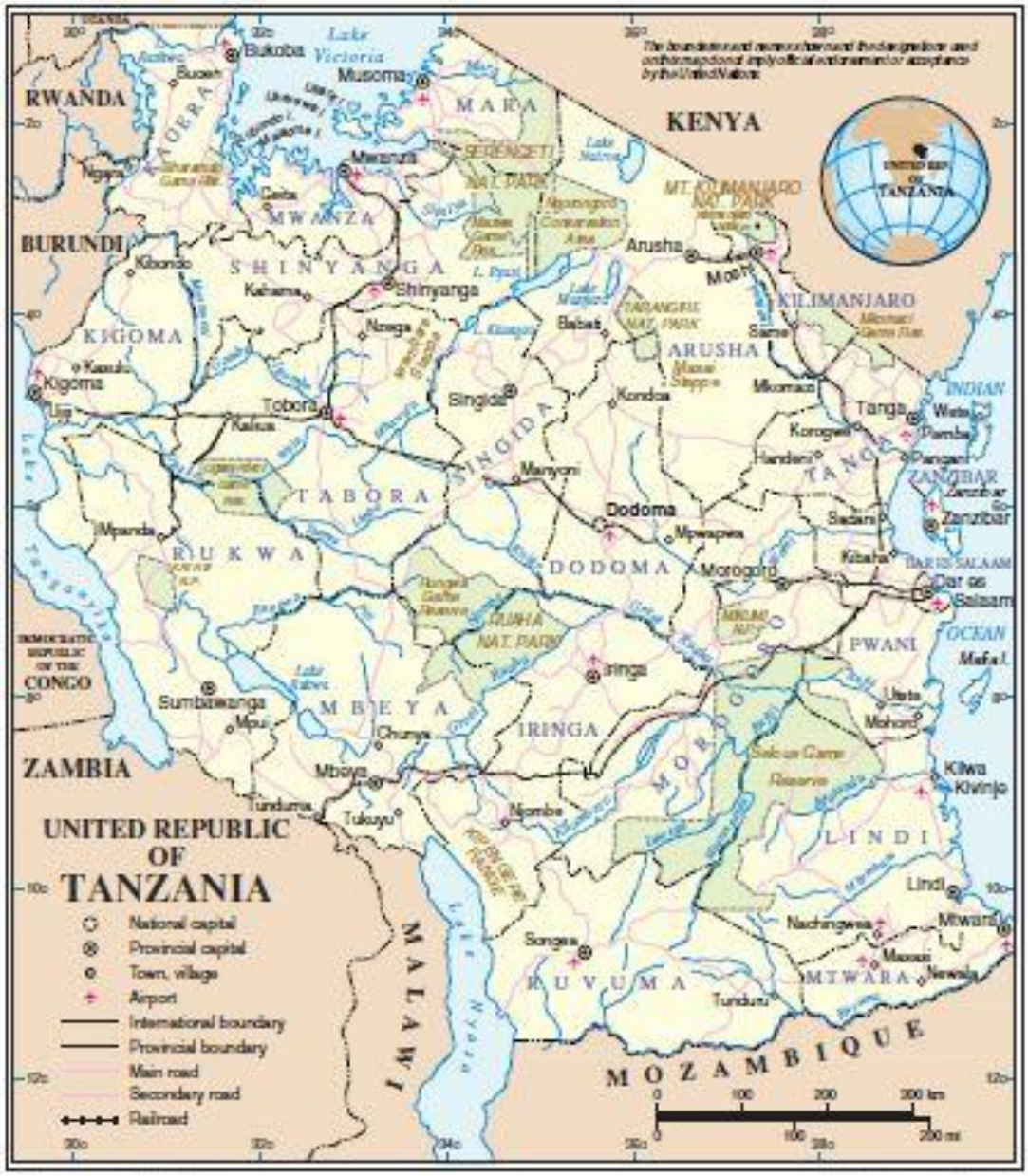
3.1 Overview of Tanzania

The United Republic of Tanzania is an East African country consisting of mainland Tanzania and the island of Zanzibar, which is approximately 30 kilometers off the coast. The Tanzania mainland comprises approximately 885 square kilometers in area and Zanzibar is 2.5 square kilometers in area. The United Nations Human Development Program lists Tanzania at 152 out of 186 countries in the world on the 2012 Human Development Index, giving it an overall ranked value of 0.476 (UNPD, 2014). Approximately 68% of the country's population lives on less than US$1.25 a day (FTF, 2012; UNPD, 2012). See Figure 8 for a political map of the United Republic of Tanzania.

Tanzania's population was estimated to be approximately 44.9 million people in 2012 and 49 million in 2014 (CIA, 2014). This constitutes a 30% overall population increase over the past ten years(2002-2012), with the greatest population boom occurring in Dar es Salaam; ninety-seven per cent of Tanzania's population lives on the mainland. Additionally, 45% of the country's total population is under 15 years old (WFP, 2013). In addition to its rapid population growth over the past decade, Tanzania has also seen significant economic and agricultural growth, and improvements in health, education and infrastructure (WFP, 2013). The 2012 adult literacy rate was 60.9%, with 80.5% of the adult women populace included in the literate population (UNICEF, 2013). What has

not greatly improved, however, is the nation's rate of poverty and nutrition, specifically households' access to and ability to acquire food (WFP, 2013).

Figure 8: Political Map of United Republic of Tanzania



Source: UN, 2006

The 2011 gross national income per capita was US$1,702 (UNDP, 2014). Agriculture is the predominant industry in the country and major exports include coffee, cotton, sisal, cashew nuts, cloves, diamonds, gold, tobacco and tea (NBS, 2013). The majority of Tanzanian households are dependent on rain-fed agriculture, with 75% of the country's labor force in agriculture (including livestock and fisheries), which accounts for more than 25% of the country's Gross Domestic Product (GDP); the lack of irrigated agriculture may account for the poverty occurring in Tanzania's rural areas, particularly when factoring in the extreme climate variability occurring in the country due to global climate change (Ellis & Mdoe, 2003; FTF, 2012; Njuki et al., 2013). The majority of agricultural production in Tanzania is dedicated to cereals, primarily maize (WFP, 2013). Oil refining and mining for gold, diamonds, iron and nickel are also major sectors of the national economy. Table 5 below contrasts Tanzania to its neighbors, Kenya and Uganda; both countries are at similar developmental stages as demonstrated by the per cent of their workforce engaged in agriculture.

Table 5: Demographic comparisons of Tanzania, Kenya and Uganda

	Tanzania	Kenya	Uganda
UN Human Development Index	0.488	0.535	0.484
UN Gender Inequality Index	0.553	0.548	0.529
Population (2013)	49 million	41 million	35 million
Per cent of population under the age of 15	45%	42%	48%
Per cent of workforce in agriculture	75%	75%	70%
Rate of urbanization	4.77%	4.36%	5.74%
Adult literacy	61%	87%	73%
Life expectancy	61	63	54
Fertility rate	4.95	3.54	5.97
GNI per capita (2011)	US$1,702	US$2,158	US$1,335

Source: CIA World Factbook (2014); UN Human Development Reports (2014); World Bank Indicators (2013)

Agriculture in SSA remains predominantly unmechanized, with low yields, and largely comprised of smallholders with few indicators of increasing productivity (Collier & Dercon, 2014). Rural poverty is driving rural-urban migration, pushing those from rural communities in search of a

better life in urban areas and needs to be viewed by policy makers as a fundamental component of structural and economic transformation (Collier and Dercon, 2014). Policy measures supportive of rural-urban migration are requisite in order for Tanzania to transform its economy from agriculturally dominant to strong, diverse modern sectors.

3.2 Tanzanian Internal Migration

Population mobility influences a range of dynamics within both sending and receiving communities, particularly land use and socio-economics, along with "administrative structure, economic growth, housing market and demand for local and regional services (NBS, 2015, p. 32)." According to the Tanzanian National Bureau of Statistics, "The volume of people involved in migration has been increasing with time because most people would like to improve their means of livelihood (2015, p. 8)." Along with the increase of population mobility, the share of female migrants has dramatically increased; for the first time since the 1948 Census, female internal migrants now outnumber male internal migrants (NBS, 2015). Migration data is gathered by comparing current residence with prior residence, usually within a one – five year timeframe (NBS, 2015). The 2012 Tanzanian Census included three questions in order to obtain migration data: (1) place of birth, (2) place of [current] residence, and (3) place of residence the previous year (2011) (NBS, 2015). The data acquired from these questions indicated intensive population redistribution occurring in Tanzania (NBS, 2015).

The 2012 Census indicated that approximately 7.8 million Tanzanians are no longer living in their place of birth (NBS, 2015). Between the years 2002 and 2012, the total number of lifetime migrants in Tanzania grew by 2.1 million people or nearly 40% (NBS, 2015). Regarding internal migration alone, Table 6 provides a summary of internal migration occurring in Tanzania, which demonstrates that approximately 17% of Tanzania's population can be considered internal migrant, 51% of whom were women. What the NBS "the feminization of migration in Tanzania (2015, p. 34), is a trend occurring across the African continent, as single, young women are drawn to urban areas to seek out the employment opportunities available in urban center.

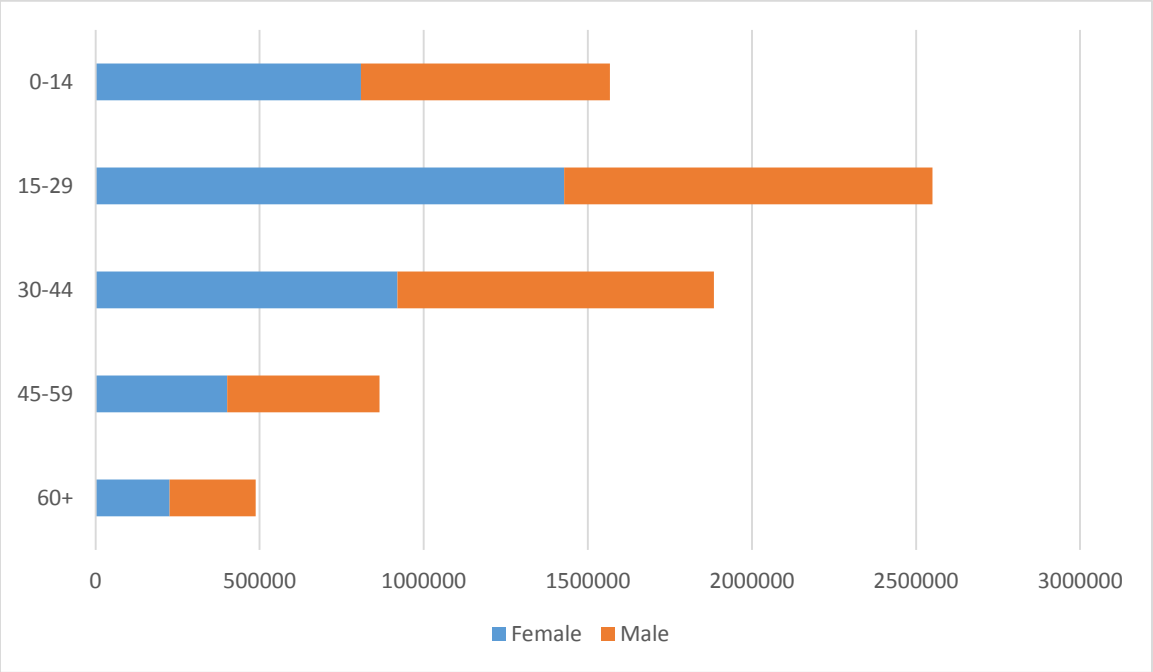
Table 6: Summary of Internal Migrants in Tanzania

Age Group	Female		Male		Total – Both Sexes	
	Number	Percent	Number	Percent	Number	Percent
Total	**3,781,624**	**51%**	**3,573,324**	**49%**	**7,354,948**	**100%**

Source: NBS, 2015

Figure 9 demonstrates that – consistent with migration literature – the age group that predominantly participated in migration was between the ages of 15-29; this age group accounted for nearly 39% of female migrants and 31% of male migrants.

Figure 9: Age Group Participation in Internal Migration by Sex



Source: NBS, 2015

The NBS found that although many major factors contributed to population redistribution, primarily they pertained to the presence of economic resources, economic development opportunities, available land and population pressures on land and natural resources (NBS, 2015). Not all regions

of Tanzania are experiencing internal migration evenly, however, as the predominant observed trend demonstrates the population shifting towards the east (NBS, 2015). This is largely in part due to the pull of the city of Dar es Salaam, which has a proportion of approximately 31% of in-migration (NBS, 2015). Tabora is the region with the next highest in-migration rate (6.4%), along with Geita (5.9%) and Morogoro (5.4%), all of which are located on Tanzania's mainland (NBS, 2015). Kilimanjaro is the region with the highest out-migration rates (7.6%), followed by Mwanza and Shinyanga, both with 7.2% (NBS, 2015). Appendix A demonstrates in-, out- and net migration by each region in Tanzania for the years 2002 and 2012.

3.3 Northern Tanzania: Kilimanjaro

Tanzania is divided into thirty administrative regions and six zones, as demonstrated previously in Figure 8. The northern zone consists of the regions Arusha, Kilimanjaro, Manyara and Tanga. According to the FAO (2006), the Kilimanjaro region contains 4% of Tanzania's total population, with approximately 1.64 million inhabitants, and 75% of its residents live in rural areas. The region's total area is 13,209 km^2 and has a poverty rate estimated at around 30%. Coffee is the primary cash crop for the Kilimanjaro region, with approximately 70% of the production occurring by smallholder farms (FAO, 2006, p.2).

A significant proportion internal migrants in Tanzania coming to Dar es Salaam come from Kilimanjaro Region in the north of the country (Gould, 2008). Natural population increase in Kilimanjaro has resulted in high population densities across the region of 900 people per square kilometer, which averages out to approximately 1.2 acres per household, and the region now has an urbanization level above 20% (Holler, 2014; NBS, 2015). This high-density region has resulted in surplus labor and supplies more migrants to Tanzania's major city, Dar es Salaam, than most other regions in the country (Gould, 2008).

Pertaining to climate change, migration may be seen as a coping mechanism in response to environmental shocks; whether as a proactive or reactive strategy, there has been a notable correlation between migration out of Kilimanjaro and education levels of those who are migrating, in that those without education were four times as likely to respond to environmental degradation and the subsequent vulnerability through migration (Ocello et al., 2014). Additionally, it's been documented that the majority of youth in the region participate in out-migration (Holler, 2014). Holler (2014) found that wealthier young migrants were more successful in finding gainful employment in destination communities, whereas those who are impoverished people – who are already more

vulnerable to environmental shocks and changes – are unable to migrate away from environmental threats, which in turn perpetuates their vulnerability (Ocello et al., 2014).

Mobility may be expected to increase in response to climate change, which is already significantly impacting Tanzania's natural resources (Ocello et al., 2014). Historically, Tanzania was already vulnerable to extreme weather events, and Kilimanjaro in particular already has observable climate change impacts, including deforestation, a drier and hotter climate and shrinking ice caps on Mount Kilimanjaro (Holler, 2014; Ocello et al., 2014). Desertification and land degradation are growing concerns for livelihoods, particularly in Kilimanjaro region. This has significant ramifications for local food security since a large percentage of the population is dependent on agriculture for their livelihoods (United Republic of Tanzania, 2012).

Land degradation, as defined by the Food and Agriculture Organization of the United Nations, is the temporary or permanent lowering of the productive capacity of land and includes (among many forms) soil degradation, adverse impacts on water resources, deforestation, and less productive capacity of rangelands (FAO, 2013). Soil erosion and nutrient depletion, among other forms of land degradation in East Africa, has a direct impact on the livelihoods of smallholder agriculturalists throughout the region and serves indirectly as a rural-rural migration driver (Gray, 2011). Tanzania's Ministry of Agriculture, Food Security and Cooperatives has already observed the aforementioned changes in the Kilimanjaro region, resulting in numerous agricultural shifts, among which include the following examples: shifts in weather patterns, impacting timing of crop production; changes in plant diseases; inability to grow maize; and reduced size of bananas that farmers are able to grow.[7]

[7] [7] Interview conducted with specialists in the National Food Security Department of the Tanzanian Ministry of Agriculture, Food Security & Cooperatives on August 12, 2014.

The most recent Tanzanian Census shows a net out-migration from Kilimanjaro of 404,594 people or nearly 39%, which is 54% high than the net out-migration in the year 2002 (NBS, 2015). Kilimanjaro currently has the third highest rate of lifetime out-migration, which has decreased from second highest in the year 2002 (NBS, 2002; 2015). The NBS attributes this to high population pressures and harsh environmental conditions in the region, resulting in lack of employment opportunities and land for settlement (NBS, 2015). A significant portion of the migrants from Kilimanjaro are moving to urban centers, namely Dar e Salaam. (NBS, 2015). Women are migrating to Dar es Salaam from the Kilimanjaro region to seek business opportunities in order to offset for the increasing challenges of agricultural livelihoods in Kilimanjaro.[8]

[8] [8] Interview conducted with specialists in the National Food Security Department of the Tanzanian Ministry of Agriculture, Food Security & Cooperatives on August 12, 2014.

3.4 Dar es Salaam

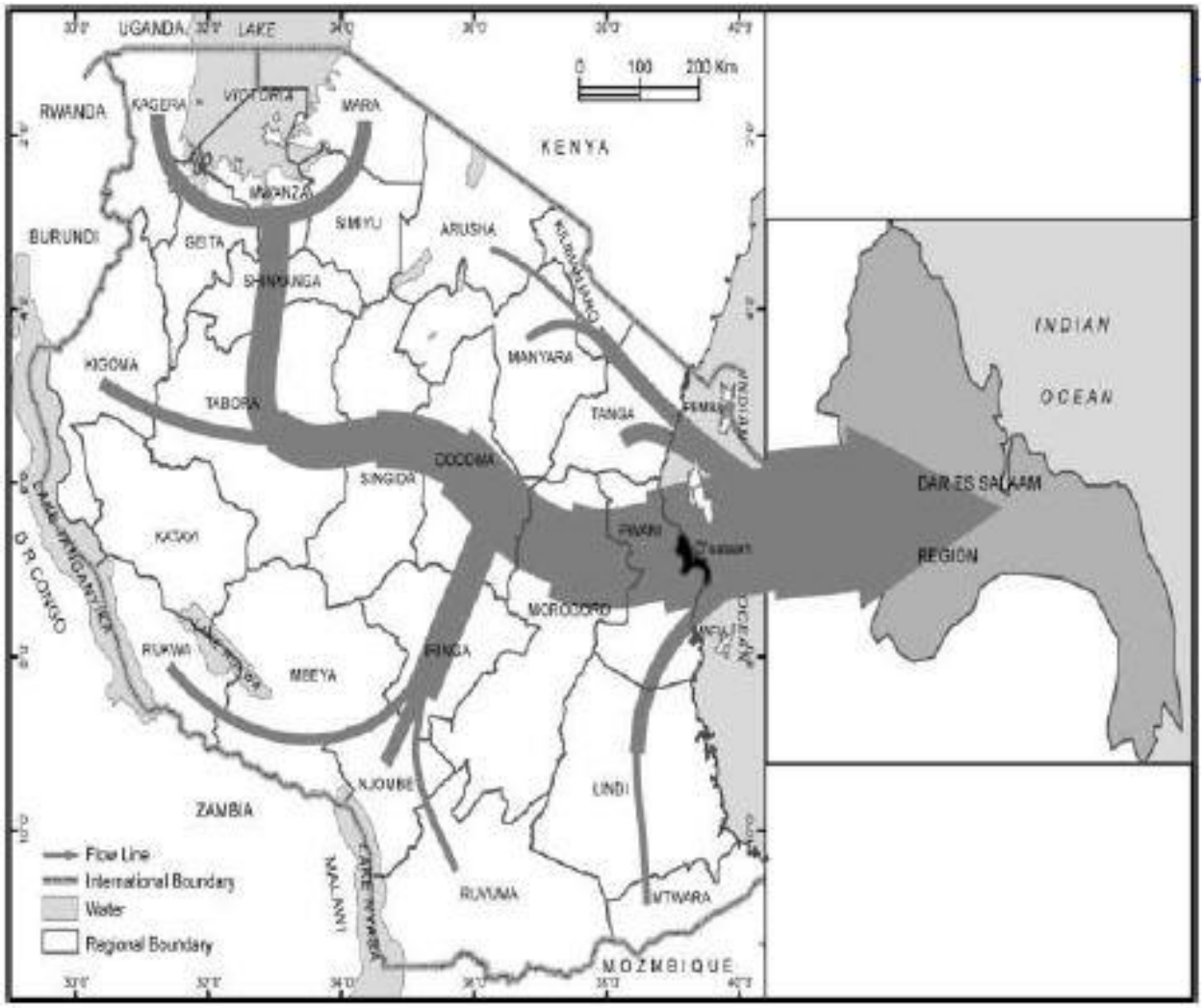
Dar es Salaam is the third fastest growing city in Africa and the ninth fastest growing city in the world (NBS, 2012). The city has a current density of 3,133 per square kilometer (NBS, 2015, p. 59). Although no longer the capital of Tanzania, Dar es Salaam is the largest city in the country with a population of 4,364,541 (in the year 2012). This is more than double the population in 2000, which was 2,115,000 (NBS, 2012). The metropolitan area is predicted to reach a total population of 5.12 million by the year 2020 (NBS, 2012).

Established around 1865 by Sultan Majid bin aid of Zanzibar, Dar es Salaam is located on the Indian Ocean and is a major shipping port and transportation hub for Tanzania. Tanzania was colonized by Germany in 1887 and Dar es Salaam began to experienced industrialization in the early 1900s with the construction of the Central Railway. Tanzania came under British rule after World War 1 and Dar es Salaam continued to serve as the country's capital after independence in 1961, until 1973 when it was moved to Dodoma. Dar es Salaam has a population of approximately 4.3 million people and remains the country's center for business, trade, manufacturing and governmental services, and contains seven (7) of the country's universities. As a major port city, Dar es Salaam is the hub of Tanzania's major transportation activities.

According to the most recent migration data from the 2012 Tanzanian Census, Dar es Salaam's population is now largely composed of migrants, with the city's in-migrant population now exceeding that of its non-migrant population, based on where its inhabitants were born (NBS, 2015). In the year 2012, Dar es Salaam contained nearly 2.3 million in-migrants. With only about 270,000 people migrating out of Dar es Salaam, the city had a net migration of approximately 2 million people (NBS, 2015). This accounts for more than 30% of all migration within Tanzania (NBS, 2015). The third largest lifetime in-migration into the region is from Kilimanjaro (NBS, 2002). The NBS (2015) states

that migrants are primarily drawn to the city because of its strong economic activities, unlike other regions that attracted migrants because of natural resources and available land. Figure 10 demonstrates internal migration flow occurring in Tanzania from various regions across the country to the city of Dar es Salaam.

Figure 10: Internal Migration Flow to Dar es Salaam by Region of Birth in Tanzania



Source: NBS, 2015

The most densely populated urban areas have crowded, poorly constructed houses and deteriorating or non-existent physical infrastructure, such as roads or sewage. Access to healthcare

has become increasingly challenging, along with other basic services such as water and garbage collection. From an urban planning perspective, the city's rapid population growth has led to prominent development challenges; infrastructure expansion has not kept up with the increasing population, which has resulted in approximately 70% of the city's residents (according to the United Nations) living in informal settlements and slums lacking basic services (Jacobi, Amend & Kiango, 2000).

Half of the city' low-income population was found to be under the age of twenty and 20% of all households were headed by a woman (IFPRI, 2002). Despite high literacy rates, the schools are in poor physical condition and unemployment/under-employment is widespread (IFPRI, 2002). A small portion (15%) of the urban population engages in some form of urban agriculture to supplement food purchases and child malnutrition remains high, with approximately 40% of children under five experiencing stunting (IFPRI, 2002).

Financing for and the availability of adequate, quality housing is already a pertinent issue and is expected to increase with the city's projected population growth (United Republic of Tanzania, 2012). What's more, the majority of the unplanned settlements tend to be constructed in areas with the greatest potential for exposure to threats related to climate change, such as flooding, sea-level rise and coastal erosion (Watkiss et al., 2011). Those who face such increased risk and exposure are predominantly poor; those who are the most economically vulnerable to the impacts of climate change typically resides in the unplanned areas of Dar es Salaam (United Republic of Tanzania, 2012). On the East African coast, Dar es Salaam is one of the most at-risk cities for flooding due to sea-level rise, with an estimated 8% of the city's land area, 140,000 people and over $170 million in economic assets considered to be in potentially vulnerable areas (Watkiss et al., 2011).

4. METHODOLOGY

This chapter explains the data sources and procedures used to conduct the research and interviews in order to test the literature pertaining to female rural-urban migration in Tanzania and seeking to determine the consequences of rural-urban migration on well-being, specifically food security, for women who migrate to Dar es Salaam.

This case study was conducted in order to gain greater insight into the experiences of women who migrate from the Kilimanjaro region in northern Tanzania to the city of Dar es Salaam and to obtain a more in-depth understanding of how their mobility impacted their well-being and quality of life. Case studies are a method of social science research that are use individual instances to develop an understanding of social phenomena and evaluate its significance for future events (Reinharz & Davidman, 1992). They can be used to explain development over time and demonstrate "the relation between individual lives and societal arrangements (Reinharz & Davidman, 1992, p. 170). According to Reinharz Davidman (1992), "feminist case studies […] let us understand women in their contexts (p. 245)." Feminist case studies are frequently employed in order to test theory and identify women's roles in the social, psychological and economic phenomena occurring within relations between gender and power within the setting (Reinharz & Davidman, 1992).

Feminist research studies marginalized population groups in general and women particular. Reinharz and Davidman (1992) describe its role in research as

> making the invisible visible, bringing the margin to the center, rendering the trivial important, putting the spotlight on women as competent actors, understanding women as subjects in their own right rather than objects for men – all continue to be elements of feminist research. Looking at the world through women's eyes and seeing how the lack of knowledge is constructed are themes running through feminist research (pp. 248-249).

Feminist research draws upon a multitude of disciplines and provides a perspective to research methods, one in which women's lives are important and worth examining as subjects in their own right – as individuals and people (Reinharz & Davidman, 1992). It provides a new perspective to topics previously identified as male-centered by reconfiguring them to bring to light women's experiences in order to transform not only gender relations, but society as well (Reinharz & Davidman, 1992). Focusing this research on women in Tanzania provided an opportunity to examine the societal structures and power dynamics shaping women's lives in this context and how they shape issues of well-being – particularly that of food security – for women in developing countries.

A comprehensive review of literature (as explored in depth in Chapter 2) was conducted pertaining to female internal rural-urban migration and the various push and pull influences that contribute to this population mobility. From this the author's conceptual framework was constructed, which provides an orientation for analysis of the data collected during the case study. The premise has come to be understood that climate change and gender inequality both have negative implications for the livelihoods of rural women and their households, often materializing as individual and household food insecurity, which can push women to migrate from their rural communities to urban areas. This migration is often facilitated through social network channels and results in increased urbanization. Interview questions were then developed to test if drivers determined from the literature matched the experiences of the women who participated in rural-urban migration in Tanzania and if their well-being was improved by the migration.

Prior to conducting fieldwork and interviews, the hypothesis was that the rapid urbanization of Dar es Salaam, which has resulted in widespread informal housing settlements lacking basic services and infrastructure, combined with culturally embedded discrimination against women, regarding access to education and types of employment, has prevented female migrants and female-headed

households from improving their livelihoods, well-being and food security, despite having improved access to services, such as health care and education, as a result of having migrated to Dar es Salaam.

Research permission was initially granted from the Michigan State University Institutional Review Board, after which a research permit was obtained from the Tanzania Commission for Science and Technology. In August of 2014, the author spent approximately two weeks in Dar es Salaam conducting in-depth interviews with approximately twenty[9] women who migrated to Dar es Salaam from the northern region of Kilimanjaro in Tanzania. While in Dar es Salaam, research was conducted through partnerships with the Center for Climate Change Studies (CCCS) at the University of Dar es Salaam (UDSM). I worked in tandem with a research assistant, who was a masters student studying climate change at CCCS at UDSM, who assisted with translations and identifying interview participants.

The initial subjects to be interviewed were identified through institutional knowledge available through CCCS at UDSM. After three subjects were identified and contacted, snowball sampling was utilized to identify the remaining subjects for interviews. "These women have a way of organizing themselves; they know how to find each other," I was told, demonstrating the crucial role of social networks for women in rural-urban migration. The initial three women were neighbors and the interviews took place in their homes. The remaining interviews were conducted at Kinondoni, Tegeta, Kimara and Ilala markets, which are located across the city of Dar es Salaam. Each morning, my research assistant from CCCS at UDSM would say to me, "Now we will go find the women."

To determine if well-being had improved for women and their households as a result of migration, a series of questions were asked pertaining to food security measures, employment, access to educational and health services, and overall household health. The open-ended interview questions

[9] A total of twenty-three women were interviewed

were used to gather qualitative assessments contrasting their well-being and quality of life in Dar es Salaam compared to prior to migration. Responses to interview questions were notated at the time of the interview and later transcribed and coded for analysis. The youngest woman interviewed was eighteen years old and the oldest woman interviewed was in her fifties. The survey tool used to conduct the interviews is attached in Appendix B.

The questions asked during the interview can be divided into five main categories and consisted of questions pertaining to migration influences, employment, household demographics, food security and other well-being measures. Women were asked various questions about the decision to migrate to Dar es Salaam, how long they had lived in Dar es Salaam, if they migrated alone or with family and if they still had family in their community of origin. Employment questions examined the process they went through from when they arrived in Dar es Salaam up to the time of the interview in securing employment and that nature of various employment in which they had been engaged. Household demographic questions pertained to number of people living in the household and their relationship to the interviewee, gender composition (number of females and males) of the household, number of children and marital status. Food security questions examined variety of foods consumed now and frequency, and compared food access now to prior to migration in terms of cost, availability, distance traveled to purchase and whether food is or was purchased or grown. Other well-being measures explored during the interview included household decision making and access to education and health care. Lastly, each woman was asked if she plans to stay in Dar es Salaam or return to her sending community.

In order to collect additional information pertaining to the multiple factors influencing female rural-urban migration, key informant interviews were also conducted with representative from the Tanzanian Ministry of Agriculture, Food Security and Cooperatives; the Tanzanian Ministry of Lands;

and the Tanzania Ministry of Community Development, Gender and Children. Data from the Tanzanian National Bureau of Statistics was gathered and analyzed in order to develop a comprehensive understanding of population mobility for the entire country and to identify trends in male and female migration, looking specifically at total population by sex, in-migration by sex, out-migration by sex and inter-movements by region, by sex. Interviews were conducted in August of 2014, the results of which were coded for analysis and discussed in the next Chapter 6.

There are several limitations to this research, one being the limited scope of the case study. Case studies by design are not able to fully encompass a population, due to their inherently small-scaled participation. Additionally, using snowball sampling may have limited the research by the lack of economically diverse participants; the snowball sampling method lead women in various markets to identity other women who had migrated from the Kilimanjaro region, who also worked in the same markets. As a result, the interviews are representative of female migrants who work at a variety of markets across the city, but did not include data from women who were not employed or employed in other sectors.

A case study was determined to be the most appropriate methodology for conducting this study, due to both limiting factors (such as time and resources) as well as this method's particular ability to directly accomplish the researcher's goal of providing a space to give a voice to women's experiences, particularly in the context of well-being, food security and economic opportunity.

5. SCENES FROM MARKETS IN DAR ES SALAAM: VISUAL OBSERVATIONS OF THE STUDY AREA AND SUBJECTS

This chapter contains images of the various markets – Kinondoni, Tegeta, Kimara and Ilala – in Dar es Salaam where the interviews were conducted, along with quotes from the women we spoke with at each market. Additional photographs are included from visits to two other significant markets, Kisutu and Kivukoni, in the city where interviews were not conducted. This chapter is intended to provide a context for physical and built environment of the markets were the women who participated in the interviews work, and where the majority of the interviews took place. The markets themselves are significant because of their representative role in both the subjects' economic opportunity as well as access to food.

Figure 11: Legumes at Tegeta

Figure 11, taken at Tegeta market, depicts sacks of legumes. They were adjacent to the stall of a woman who sold rice at the market. She was very engaging as she discussed being a business women, until the conversation shifted to the new government regulations that now require her to use electronic measurement for selling rice but and how expensive the new equipment is. Predominantly, however, she was light-hearted throughout the interview, the most memorable moment was, perhaps, that when asked about life in Dar es Salaam after migrating, she said, "The beer is better."

5.1 Kinondoni Market

Figure 12: Entering Kinondoni Market

The first market visited for interviews was Kinondoni market, portrayed in the picture above. This was perhaps the smallest of the markets visited for interviews. One of the women interviewed at Kinondoni market discussed her successes since migrating to Dar es Salaam, which she included as having her children in school and her plans to attend school herself one day. She said she is much

healthier living in Dar es Salaam than she was prior to migrating. She plans to return to her home community someday, after making a good future for her children.

Figure 13: Bananas at Kinondoni

One of the women interviewed at Kinondoni market sold bananas (Figure 13). She sold them individually, as is, or would peel them and prepare them for her customers to take home and cook. She is the only woman who participated in the case study who is a part of a *vikoba*, which is a women's association. The intention behind such organizations is that women pool together their resources to

provide access among the group to resources they otherwise wouldn't be able to obtain. Such organizations have a strong reputation for their positive impacts on women's access to vital resources, which can ultimately improve their welfare and livelihoods.

5.2 Tegeta Market

Figure 14: Entering Tegeta Market

Tegeta was the second market and perhaps the largest food market where interviews were conducted during the case study. Below are a series of quotes from the interviews conducted with women who own a market stall at Tegeta.

"When I moved here I worked in customer care with digital equipment. I quit and worked in a salon. Then I quit and started [my] business."

"I didn't come looking for a job. I got married and came to live with my husband."

"I will return after completing [my] education. My father is there."

"I like being my own boss. I will never go back [to Kilimanjaro]. I've found a life here."

"I came here to find a life. When I earn enough money I will open a shop."

"If I had more money, I would increase my business. [We] are able to survive; [there is] less disease here."

Figure 15: Women at Tegeta Market

"You eat what you grow at home. There is more purchasing variety here. At home we grew all our food. Here I take [our food] from my business."

"I don't always make a profit. Sometimes the produce goes bad. Income fluctuates here but I didn't earn anything [back home]."

Figure 16: Women Selling at Tegeta Market

5.3 Kimara Market

Figure 17: Women Selling Produce at Kimara Market

"I can work and rest [in Dar es Salaam]. There was no rest back home."

"Food is more expensive here. You have to buy everything."

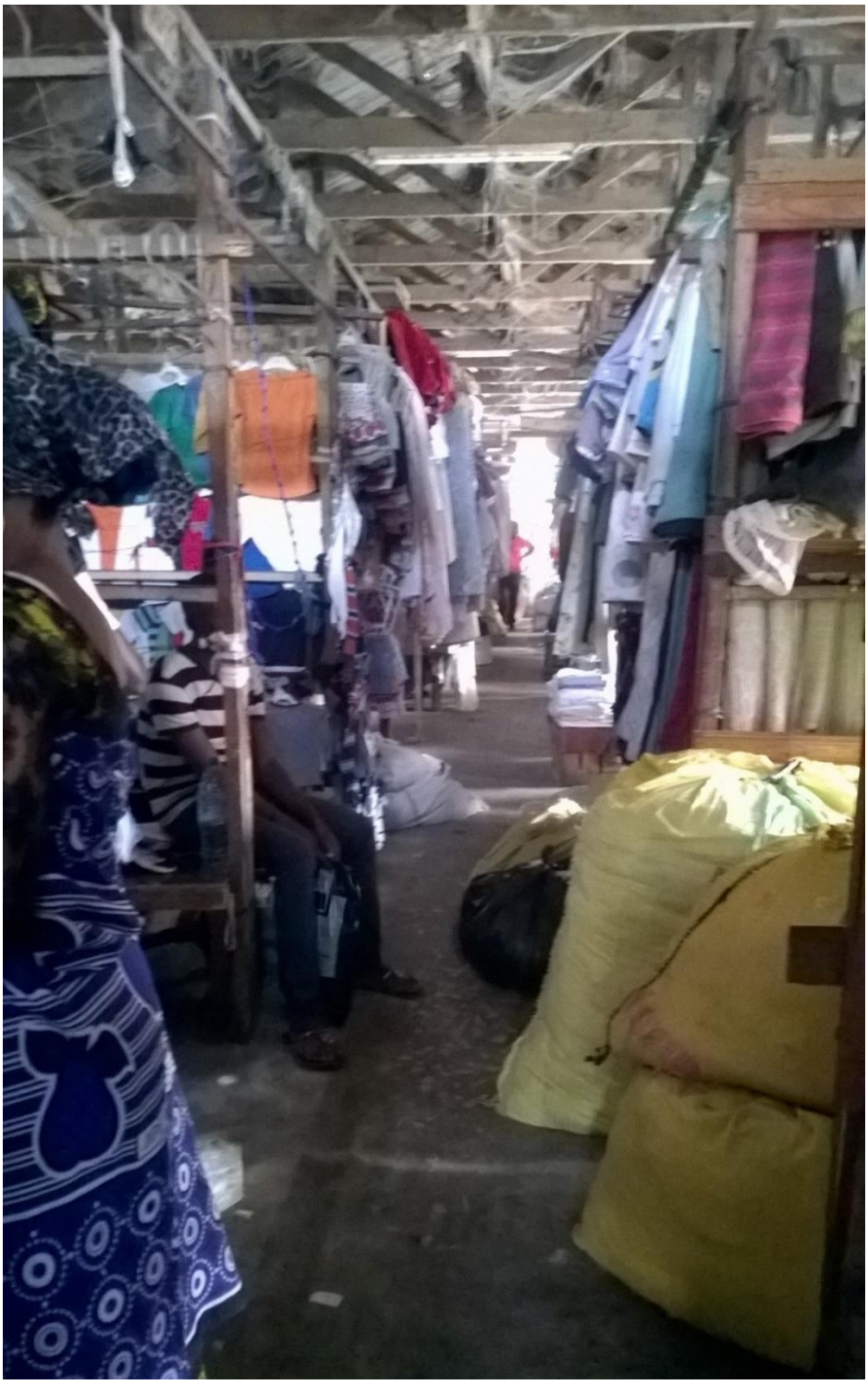
One of the women interviewed at Kimara market was a cook who sold hot meals to the people who were shopping and working at the market. She worked in an enclosed room behind the open market area where she prepared food and tea over a charcoal fire. The room had a table where people could sit and eat. On one side of her market space, there was a stall which sold live chickens and throughout the course of the interview, a number of people walked passed holding the chickens they had purchased. At one point during the interview, a man came into the room: he was the butcher, whose shop was located on the other side of her business and prepared the just-purchased chickens for people to take home and cook. He offered to let me come next door and watch the process.

- *"School is expensive here. My uncle helps my father with the costs. It costs less at home."*
- *"We grew our food and ate as we liked. Here we must buy everything."*
- *"I pay school fees using business profits. I bought land and built a house."*
- *"I came to Dar es Salaam in 1991. I worked as a maid for one year before returning home. I returned to Dar es Salaam in 2001. I cooked for a woman for three months before opening my businesses at the market. I bought my own land here before getting married but my husband and I built our house together."*
- *"We earn money here. We have eat here. Back home we worked hard for no money. We worked hard all day at home. We didn't eat until the evening. We ate at 4 pm and not again until the next morning."*

Figure 18: Kimara Market

5.4 Ilala Market

Figure 19: Ilala Market



Second hand clothing from Europe and the US to be sold arrives in large sacks (Figure 19).

All of the women interviewed at Ilala market mentioned the disrepair of the building, explicitly the leaking roof. One woman described her health as worse since she migrated, due to the chemicals she was exposed to from working at the market. All of the women interviewed at Ilala market said they planned to stay in Dar es Salaam forever.

5.5 Kisutu Market

Figure 20: Kisutu Market

Kisutu Market is one of the most prominent food markets located in the city center in Dar es Salaam. All of the vendors at the market are men.

Figure 21: Entering Kisutu Market

5.6 Kivukoni Market

Figure 22: Kivukoni Market

Kivukoni is the biggest fish market in Dar es Salaam and sells an expansive array of fish, crustaceans and all types of imaginable seafood. Fisherman bring their boats directly up to the market, which is located on the Indian Ocean coast. Although the picture of the market in Figure 22 and 23 was taken in the afternoon, in order to purchase the best fish, the market must be attended very early in the morning.

Figure 23: Fishing boats coming into Kivukoni market

6. RESULTS AND FINDINGS

In this Chapter, the results of the interviews conducted in Dar es Salaam are examined in the context of the original research questions and the findings are discussed. The word cloud below, depicted in Figure 24, is a culmination of the interview responses. The size of the word pictured in the word cloud is representative of the frequency of use of the word; the bigger the word, the more often it was used. As depicted below, business, home and market were the three most utilized words in the twenty-three interviews that were conducted.

Figure 24: Interview Responses Word Cloud

In total, twenty-three (23) women who had moved from the Kilimanjaro region to Dar es Salaam were interviewed as part of this research in August 2014, the youngest of whom was eighteen (18) years old. Slightly more than half (52%) of the respondents were determined to be household heads based on responses to questions regarding household composition and decision making within the household. The remaining 48% of respondents either had a husband or older relative (such as a parent, aunt or uncle) present who were determined to be the head of the household.

The head of a household is a cultural construct with multiple social implications. At its premise, the household head is the one who makes the important decisions for the members of the household. Household decision making that was examined included who decides how income is spent and who makes decisions regarding household health care. Regarding deciding how income is spent, 57% of the women interviewed said that they made that decision, 26% said they decide together with their husbands. Only two women (9%) said that their parents decide; one said that her husband decides and one said that her mother-in-law decides. When considering only the women who are married, 55% of them said that they decide together with their husbands how income is spent, 36% said they decide on their own and 9% said their husband makes the decision. Women who were not married predominantly (82%) decide on their own how income was spent, although some (18%) said that their parents decide.

For health care decisions, most of the women interviewed (43%) said they make their own health care decisions, 26% make the decisions together with their husband and 13% said their husband decides. The remaining women interviewed said their parents or other family members made household health care decisions. Similar to decision about how to spend income, 55% of the married women said that they make decisions regarding health care together with their husband, 18% responded that they decide alone and 27% responded that their husband decides. The single women either make decisions about health care on their own (67%) or an older relative in the household decides for them (33%), such as a parent or aunt or uncle.

Based on these responses, slightly more than half of the women interviewed were determined to be the head of their household. This finding was reinforced by the finding that approximately the same number of women who were determined to be heads of their household were not married or no

longer married and did not have an older adult male relative living in their household (such as a father, uncle or father-in-law).

Sizes of households ranged from only consisting of the woman being interviewed to as many as seven people, with the average household size consisting of 4.2 people (a median of four) (Figure 25). Marital status or whether the woman interviewed was the household head did not have a significant impact on household size. Gender composition within households ranged from one (1) to five (5) females, and zero (0) to five (5) males, with the mean number of females at 2.2 and the mean number of males was 1.8. Both the median and mode for both genders was 2. Approximately half of the women were married (48%) although slightly more (52%) were not married or no longer married. More than three-quarters (78%) of the women interviewed had children, ranging in age from less than a year old to adults. The number of children ranged from 1 – 3, as displayed in Figure 26. Marital status or whether the woman interviewed was the household head did not have a significant impact on the number of children they had.

Figure 25: Household Size of Respondents

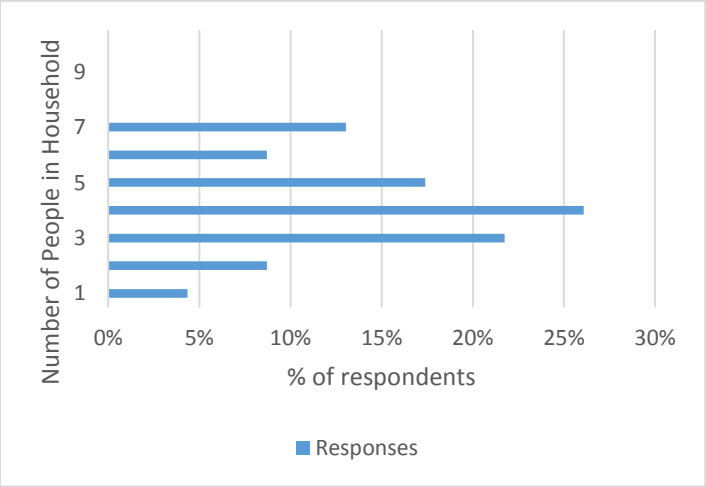
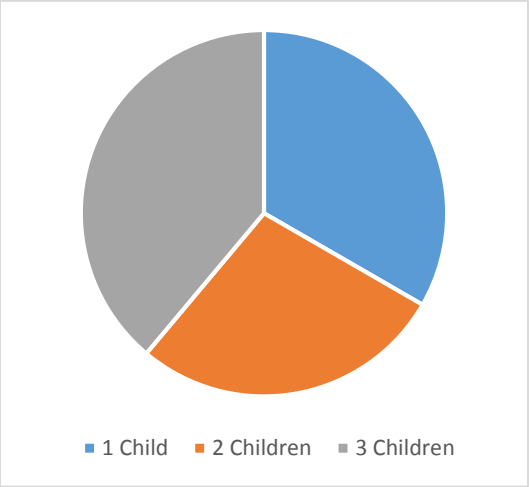


Figure 26: Number of Children

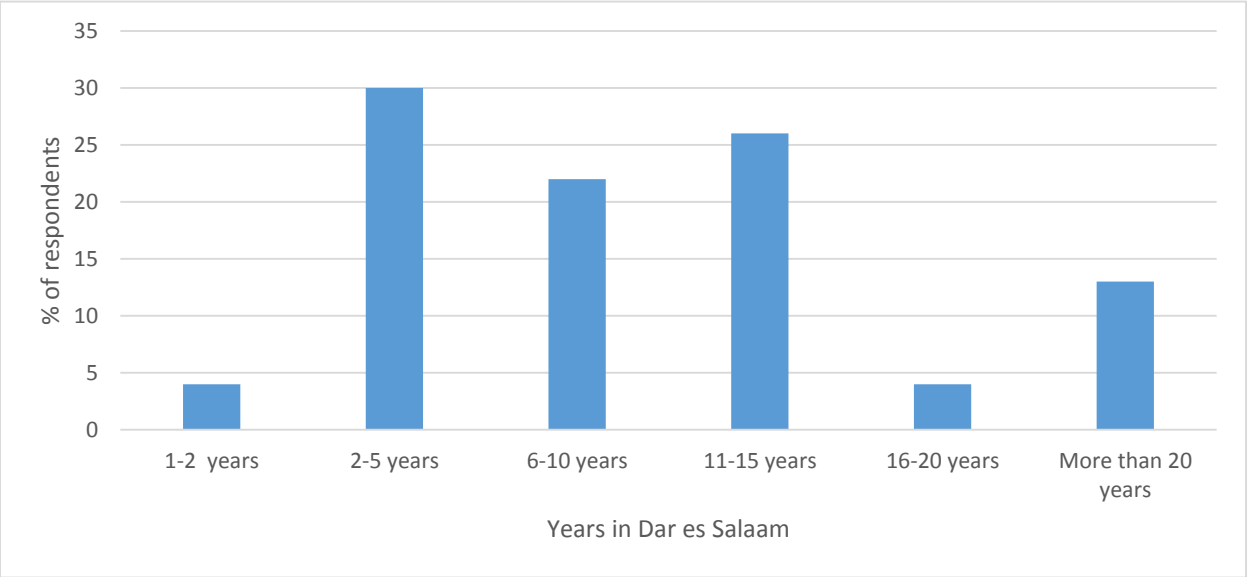


Most women did not live with a parent (only 17% did) and only two (9%) of the women interviewed lived with a mother or father in-law. Approximately 43% of households had one or more other

relatives living with them. Younger relatives (who were not her own children) who lived in the household were generally nieces, nephews or younger siblings; older relatives consisted of siblings, uncles and/or aunts. One woman interviewed had two adult sons, but was living with and caring for her deceased brother's six children. One of the women who had migrated to Dar es Salaam for school lived with her *Mama Kidogo* (her mother's younger sister), uncle and their two daughters. About one-fifth (21%) of the women surveyed had people living in their household who were not family members. These additional household members were generally comprised of hired help, usually a maid or in one case there was a boy who looked after the chickens and a boy who helped in her husband's shop.

The number of years that the women who were interviewed had lived in Dar es Salaam ranged from one year to more than twenty (20) years, with 30% of respondents having lived in Dar es Salaam for between 2-5 years (Figure 27). This was consistent with married women (36%) and female household heads (33%). Predominantly, the single women interviewed had lived in Dar es Salaam either 2-5 years (58%) or more than twenty years (17%), and 45% of the married women who were interviewed had lived in Dar es Salaam between one and two years. Two of the respondents were still in school and weren't employed but the rest of the women interviewed were, predominantly business owners operating stalls at the markets. Many had worked in one or more other jobs before the job they had at the time of the interview, predominantly in a restaurant or as a housemaid or seamstress. Only 26% of the women interviewed said that they were making the money now that they had expected that they would prior to leaving their communities of origin. Despite this, most women said that their household income had increased since migrating to Dar es Salaam.

Figure 27: Number of Years Lived in Dar es Salaam



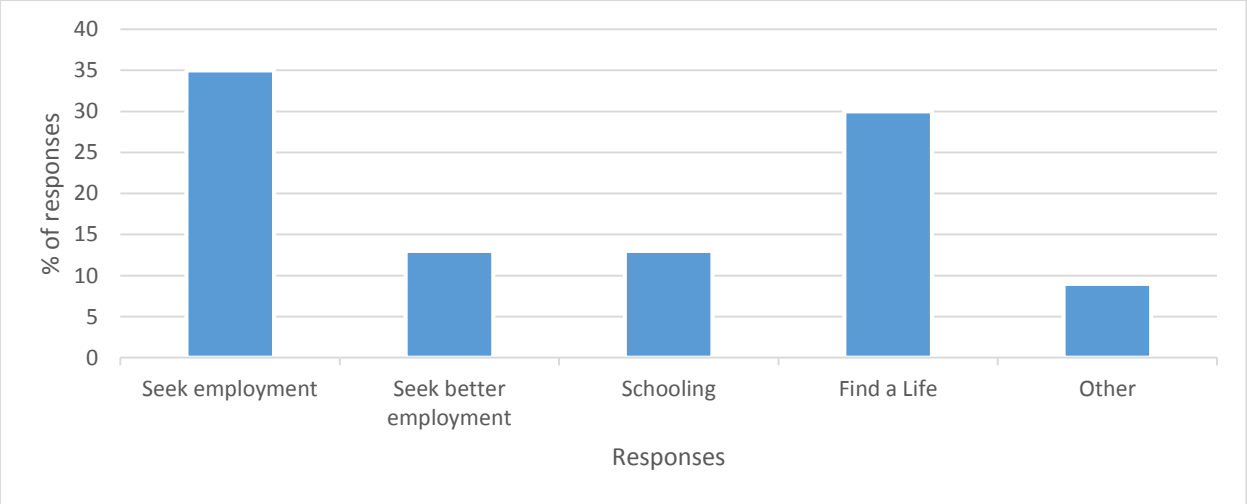
Based on the interviews conducted, the following findings may be concluded from survey results in respect to the research questions for this paper.

6.1 *Why are women and female-headed households moving to Dar es Salaam?*

Finding 1: Women are migrating from the Kilimanjaro region to Dar es Salaam in search of greater economic opportunity and life change, despite the existence of the gap in the perception of greater economic opportunity and reality.

When asked why they left their communities of origin in Kilimanjaro to migrate to Dar es Salaam, the predominant response (48%) was that they came to seek employment, or came to seek employment better than what they had, as demonstrated in Figure 28 below. This response was particularly significant (58%) among women who were not married or determined to be household heads, compared to the 36% of married women who came to seek employment or better employment, although predominantly the respondents were not married at the time of their migration to Dar es Salaam. Most women interviewed (87%) came from a village in the Kilimanjaro region. This high percentage rate occurred for both married (82%) and unmarried women (92%), as well as for those determined to be heads of households (83%). Overall, respondents were predominantly from agricultural households in their communities of origin, with approximately a third (30%) from households dependent on subsistence agriculture.

Figure 28: Reasons for Leaving Kilimanjaro and Migrating to Dar es Salaam



Multiple women cited their lack of education as a challenge to finding employment when they first arrived in Dar es Salaam; therefore, the 13% of women who came to Dar es Salaam for schooling are also improving their prospects for better economic opportunity, as higher educational attainment enables wider range of prospective employment, as well as the probability of higher wages.

Many of the women who said that they planned to stay in Dar es Salaam and not return to their communities of origin in Kilimanjaro said that their ability to own land and a house in Dar es Salaam was why they intended to stay. More than 40% of the women interviewed specifically mentioned owning a house in Dar es Salaam as why they planned to stay. Multiple women described how – in their communities of origin – their families won't distribute land to women. Additionally, in rural areas, upon marrying, women will move to their husband's family's land, to which they have no claim of ownership. The inability to own land where the local economy is predominantly agriculturally based severely limits livelihood prospects and served as a push factor for the women who migrated to Dar es Salaam, where economic activity is not dependent on land.

The second most frequent response was unanticipated by the researcher, but 30% of the women answered without hesitation that they came to Dar es Salaam to "find a life" or "to find a better life." When considering married women alone, 45% of participants indicated this as their reason for migrating. This response perhaps embodies the spirit of migration and captures all the aforementioned conditions and desires – seeking [better] employment, opportunities for education, the ability to own property – and more. Their response conveys both the hardships that pushed them from home and the hopes of unknown possibility that pulled them to seek out something new.

Although it was apparent that the women interviewed continue to face a multitude of challenges as business owners maintaining stalls at the various markets where our interviews were conducted, many of the women spoke of the contrast between their livelihoods now compared to in

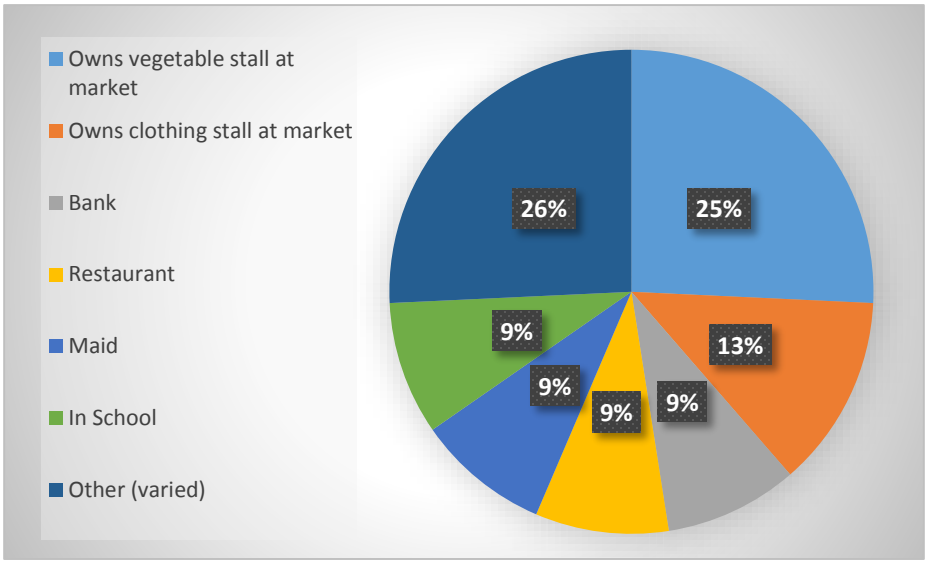
their communities of origin. A woman described the difference as that she can "earn money here; [she] can eat here. Back home, they worked hard for no money." Another woman said that here she can "work *and*[10] rest. There was no rest back home."

When asked if they initially found the job they wanted when they arrived in Dar es Salaam, only 39% of the women interviewed answered yes. The other 61% worked multiple different jobs before getting the job that she wanted or were still working towards the goal of better/more preferred employment. The range of employment in which the women interviewed had engaged in was quite varied, but predominantly consisted of low skilled labor and/or in the service industry. This, however, was not necessarily the case for women who were determined to be the head of their household, the majority of whom (58%) indicated that they did initially secure the job they wanted upon migrating to Dar es Salaam.

Figure 29 shows the employment that the women interviewed secured upon arriving to Dar es Salaam. Most of the women (65%) are still working in the same occupation as when they arrived in Dar es Salaam, although the others of them had one (26%) or two (9%) other jobs prior to their current one. These results may have been significantly impacted by the sample population, who predominantly worked in the markets. In one year or less after arriving in Dar es Salaam, 70% of the women interviewed were able to obtain either the employment they desired or their current occupation. Most of the women who immediately started their own business had their own capital required to do so when they arrived in Dar es Salaam. Conversely, those who worked in other jobs previous to opening their own business at the market talk about needing to save money and/or acquire capital prior to being able to open their business.

[10] Emphasis added by author.

Figure 29: First Type of Employment in Dar es Salaam



Recalling that it is often the *perception* of greater economic opportunity that pulls migrants from rural areas to urban centers, 74% of the women who were interviewed said that they were not making the money that they had expected they would make when they moved to Dar es Salaam. When separated by marital status and household head, however, this result looked significantly different; a significant portion of married women (82%), single women (67%) and household heads (67%) responded that they were not making the money that they had expected to earn. This finding was reinforced by the diversity in responses when they asked to compare their income now to their income prior to migrating. Approximately 35% said their net income had increased; 17% said it stayed the same; and 13% said it decreased. Comparing income between their community or origin and current conditions in Dar es Salaam was clearer among married women, 45% of whom indicated that their income had increased, compared to only 25% of single women and heads of households.

One woman commented that although she has the same income now as when she lived in Kilimanjaro, she worked much harder there than she has to now. She said that in Dar es Salaam she was more active, had more work and more food. Another woman remarked that she doesn't always

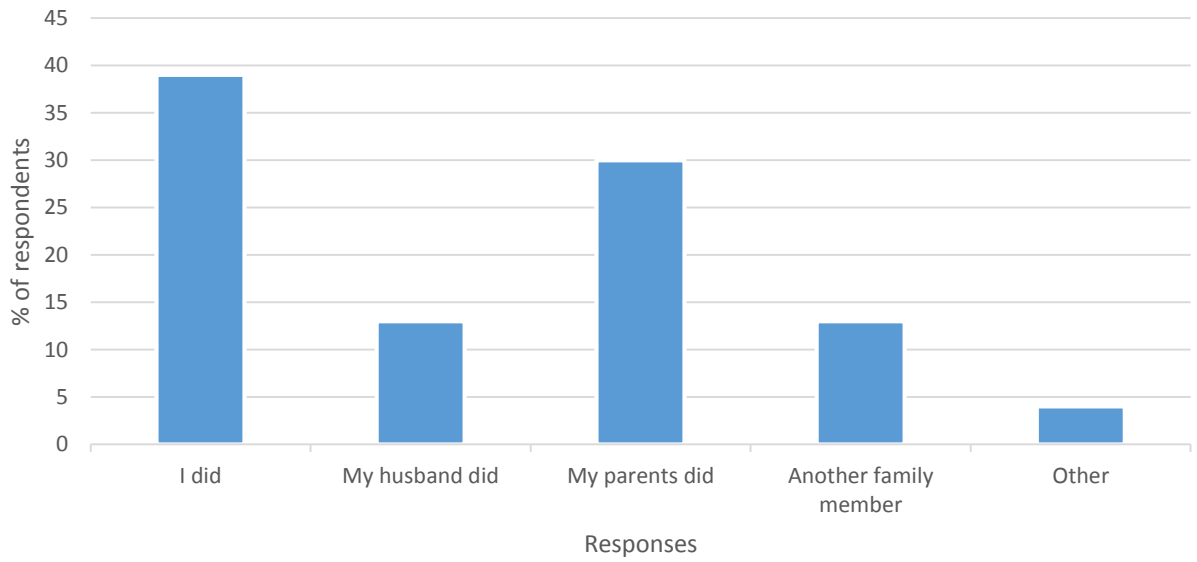
make a profit at her vegetable stand, especially if the produce goes bad before she is able to sell it. She went on to say that although her "income fluctuates here [in Dar es Salaam], but [she] didn't earn anything back home." A woman selling second-hand clothing commented that although she had a better standard of living back home, she had more money in Dar es Salaam. "Here, you can sell anything," she remarked. She said that with more money, in Dar es Salaam there was a greater variety of foods to choose from and that her household was healthier now because she was able to earn money to buy anything – mentioning specifically ointments and shoes.

Finding 2: Women who are migrating to Dar es Salaam from the Kilimanjaro region are not necessarily making the decision to do so on their own and usually have support networks in both sending and destination communities.

During the interviews conducted, the participants were asked who had made the decision that she would migrate (Figure 30). As a whole, those who said they had made the decision on their own comprised only 39% of the women interviewed; the remaining 61% said someone else had made the decision for them. Accounting for marital status and household heads gives an interesting perspective to this decision process. Regarding married women, 36% indicated that they made the decision to migrate on their own, the rest of the responses were evenly split between their husband, parents or other family members deciding. For women who were not married at the time of the interview or those determined to be household heads, husband and other family members did not play as significant a role in the decision to migrate (only 8% of respondents indicated they did); the decision

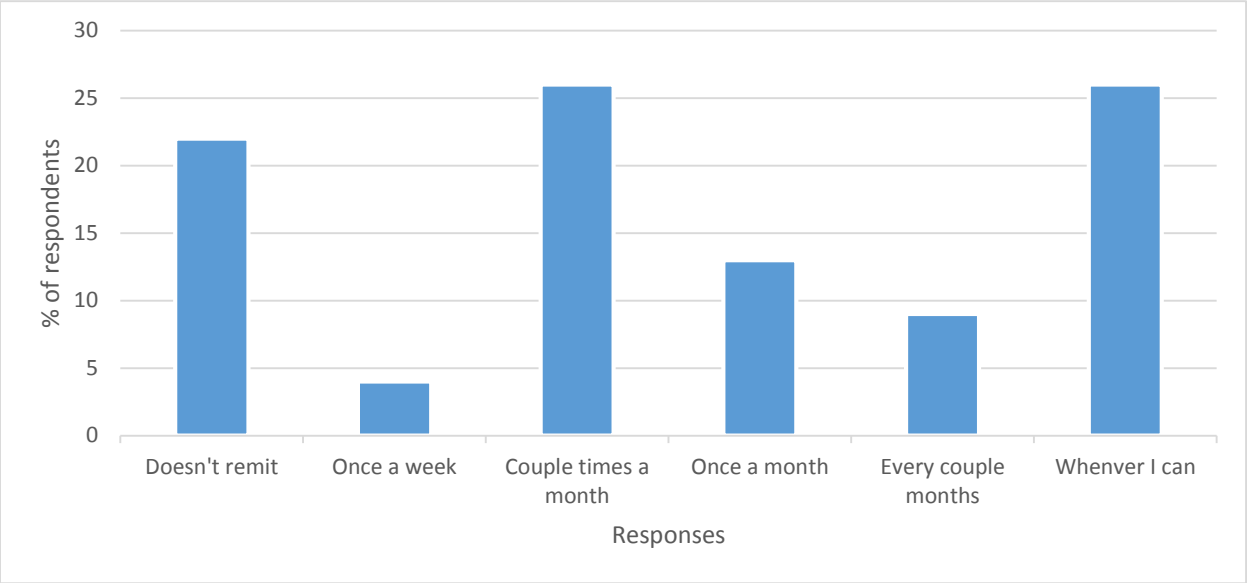
was primarily one they made on their own (42% and 50%, respectively) or made by their parents (42% and 33%, respectively).

Figure 30: Who Made the Decision for You to Move?



The majority of women interviewed (83%) still have family living in their communities of origin and just as many said that they send remittances back to their family. Figure 31 shows how often the women interviewed send remittances back to their communities of origin. Single women tended to remit less often, a quarter of whom indicated that they do not send money at all. Three of the women interviewed (13%) have children who they sent back to their communities of origin to attend school. The children live with relatives and the women send money to pay for their schooling, which is less expensive in Kilimanjaro than it is in Dar es Salaam.

Figure 31: How Often Do You Send Remittances Home?



These findings support a number of concepts discussed in migration literature: (1) that the decision to migrate is primarily made at the household level; (2) households invest in family members with potential to remit earnings; and (3) female migrants tend to remit significant portions of their income to family members who remain in their sending communities.

When asked if she knew anyone when she moved to Dar es Salaam, only 9% of the women interviewed didn't know anyone at all when she came to Dar es Salaam. This response – indicating knowing no one at the time of migration – came exclusively from the women who were married at the time of the interview. Most women (74%) had family who either already lived in Dar es Salaam or migrated with them; some women knew someone from her hometown (13%) and a few had friends (4%) who had already migrated to Dar es Salaam.

6.2 *What is the role of climate change in the decision to migrate?*

Finding 1: Climate change in the Kilimanjaro region is altering agriculturally-based livelihoods across the region, with implications for food security and population mobility.

None of the women interviewed as part of this research responded directly that climate change was the reason why they decided to migrate to Dar es Salaam, nor should they be expected to respond in such a manner. Climate change is a global phenomenon occurring over space and time; its specific direct impacts on individuals are not always immediately apparent. When observed from a greater spatial and time perspective we are better able to understand how our individual experiences fit into the changes occurring. Interviews conducted in the National Food Security Department at the Tanzanian Ministry of Agriculture, Food Security and Cooperatives (MAFC) gave a greater perspective and understanding to how climate change occurring in the Kilimanjaro region is directly impacting agricultural households and augmenting population mobility, especially female rural-urban migration.

Bananas and coffee are the main cash crops in the Highlands of the Kilimanjaro region, which is the leading coffee producing region in Tanzania. Agriculture in Tanzania as a whole is predominantly rain-fed, un-mechanized and small-holder based. With increasing variability in weather events – particularly rainfall – consistent agricultural production (including livestock) becomes problematic and expounds upon already low labor and land productivity. According to the MAFC, 75% of agricultural laborers in rural across Tanzania are females, with Kilimanjaro being no exception; however, land holdings – including farms and plantations – remain predominantly owned by males.

Notable changes in rain patterns have occurred across the region, where the rainy season is now shorter and comes later. Historically, the planting season was well defined and households new when to plant specific crops; however, now the rain patterns have shifted and relying on past farming

calendars tends to result in crop failure (Muthoni & Wangui, 2013). The region has experienced heavy environmental degradation due to increasingly unpredictable seasonal rainfalls. Previously, shorter rain falls were experienced every ten years, but now precipitation failures are being observed nearly annually (Holler, 2014). This may be attributed to the loss of cloud forests on Mount Kilimanjaro, which is resulting in reduced water flow as well as reduced annual precipitation (Holler, 2014). The shifting weather patterns have altered the sequential timing of food production: the consequences being that farmers no longer know when to plant crops. Furthermore, the shift in weather patterns has resulted marked crop alterations. For one, the bananas grown in the region have become conspicuously smaller. Foliage across the region has dramatically shifted. Additionally, farmers across the region have also noted change in the plant diseases the effect their crops.

Farmers across the Kilimanjaro region are being encouraged by MAFC to plant drought tolerant varieties, from one maize variety to another. This is resulting in a significant shift in subsistence agricultural households. Traditionally, households predominantly consumed what they grew, but – according to the MAFC – changing production patterns to what is able to grow under the new climate conditions is causing more households to sell what they are able to produce and then buy the foods they desire to eat.

Along with more frequent droughts in the lowlands and other weather variability, globalization of the coffee trade has resulted in falling coffee prices in recent years, which has led to many coffee farms in the highlands being abandoned. The ability to grow coffee has also been impacted by climate change in the form of changes in pests and plant diseases. This has served as a significant push for female rural-urban out of the Kilimanjaro region to Dar es Salaam. To compensate for the loss of household income, women have migrated to Dar es Salaam to start businesses or seek out other sources of income. In the words of one of the MAFC employees interviewed, "Men were dominant

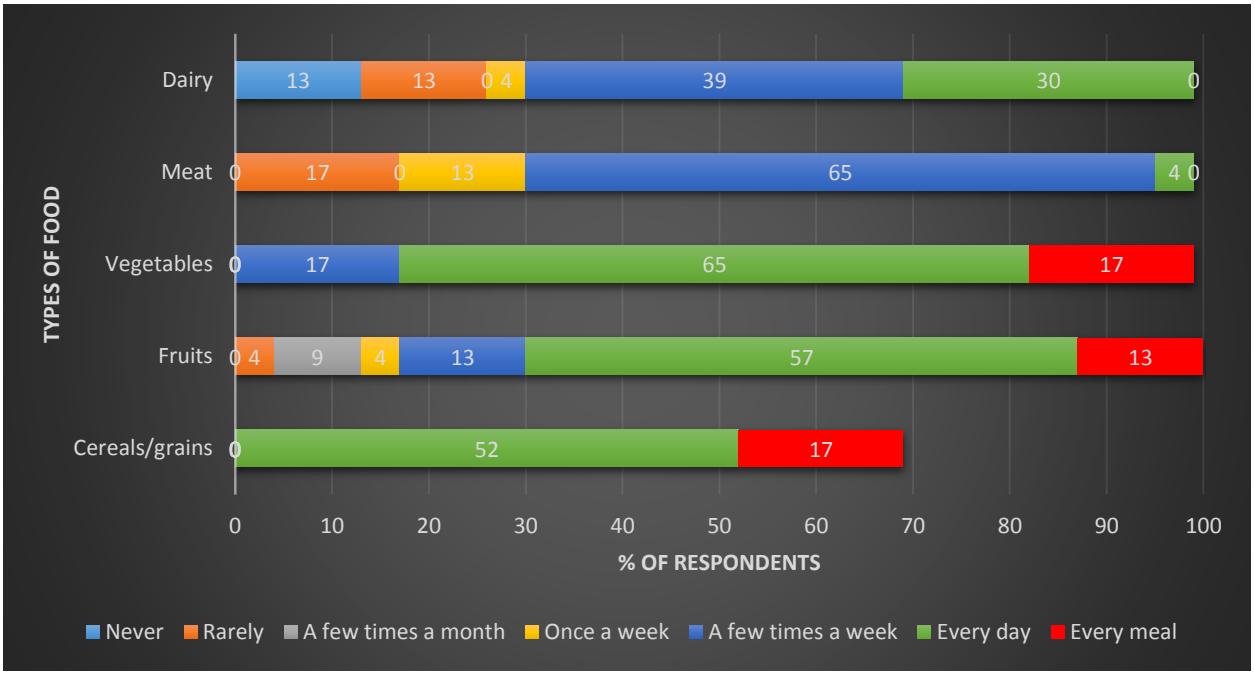
in the production [of coffee]. Women used to stay at home but came to Dar to do business to make up for price reduction. Where men produce crops, when prices drop men don't know what to do so women pick up and sell bananas, causing them to migrate."

6.3 *Is migration improving their well-being, specifically food security, and the well-being and food security of their households?*

Finding 1: Migration has increased food security for women and their households as reflected by the variety of foods they are able to consume in Dar es Salaam.

Predominantly respondents said they ate cereals/grains, fruits and vegetables every day and meat and dairy a few times a week (Figure 32). When asked about their consumption of *fresh* fruits and vegetables, every woman got quizzical look on her face and typical responses were generally along the lines of the following statement: "I don't know how fresh the fruits and vegetables are because I don't know when the farmer picked them."

Figure 32: Frequency and Variety of Foods Eaten by Respondent living in Dar es Salaam

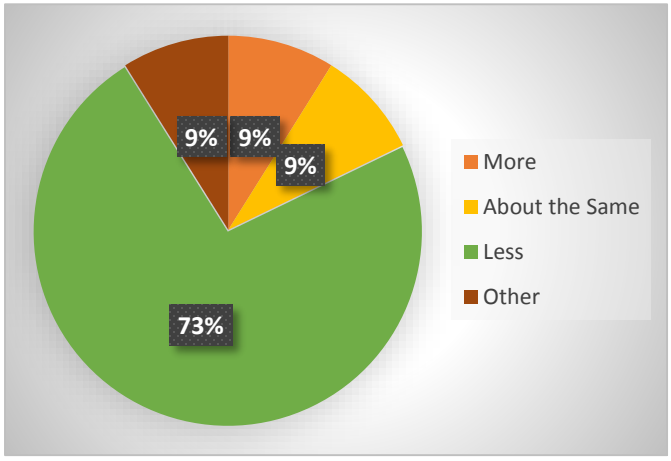


When asked, if they had additional financial resources, what kind of foods they would buy more of, about as many women said that they would buy more fruits and meats as said that they would

buy more cereals/grains. Women who responded that they would buy additional cereals/grains said they would do so because cereals/grains last longer.

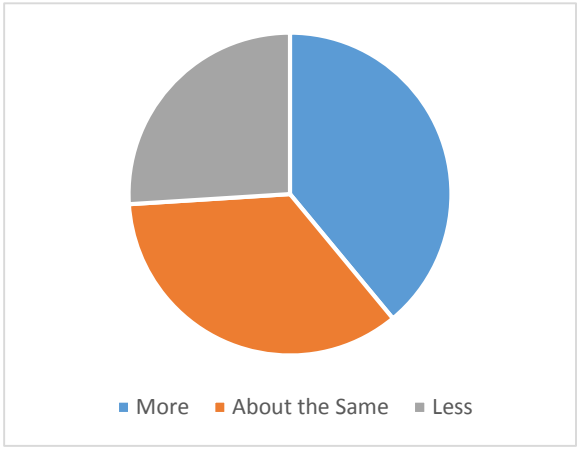
Although 70% of the women interviewed said they eat three meals a day (the remaining 30% said that they eat two meals a day), when asked if they eat more or less now that they live in Dar es Salaam than they did when they lived in Kilimanjaro, 73% of the women interviewed said that they eat less now (Figure 33). This response was particularly high among women who were not married at the time of the interview (92%) and women determined to be heads of households (75%). Of the women who said that they eat less now, approximately 60% of them attributed this change to the tropical climate in Dar es Salaam (compared to the cooler climate in Kilimanjaro), saying it was "too hot to eat." One of the women who said that she eats more now that she lives in Dar es Salaam compared to prior to migrating said that, back in Kilimanjaro, "they worked hard [in agriculture] all day and didn't eat until evening; they ate at 4 pm and not again until morning."

Figure 33: Eating More or Less in Dar es Salaam than in Kilimanjaro



Contrasting the variety of foods consumed now by the respondents, approximately 40% of respondents said they were now eating a greater variety of food, approximately 25% said they now eat less of a variety of foods, with the 35% eating about the same variety now as they did in Kilimanjaro (Figure 34). When asked if they eat better now than they did in Kilimanjaro, 53% of women interviewed said yes, 33% said they eat as well as they did in Kilimanjaro, and only 6% said no, they do not eat better now. When separated based on marital status, however, 55% of married women said that they eat better now, while 50% of women who were not married said that they do not. Those who responded no said cited reasons such as the food was more natural back in Kilimanjaro since they grew everything there or that there were more chemicals in the food they were consuming here in Dar es Salaam. The women who said they and their households are eating better now attributed it to having more household income as well as having greater variety available to purchase. "In Dar [es Salaam]," one woman said, "you can buy anything you want." These metrics for variety in their diets and in the diets of other members of their households, based on the above noted interview responses pertaining to variety and frequency of consumption, indicate that they are more food secure since migrating to Dar es Salaam.

Figure 34: Variety of Foods Eaten in Dar es Salaam Compared to Foods Eaten in Kilimanjaro



Finding 2: Migration has increased well-being as measured through greater food security for women and their households through increased access to food in Dar es Salaam.

Nearly 80% of the women interviewed said that food costs more in Dar es Salaam than it did in Kilimanjaro (Figure 35); part of this increased cost may be attributed to an increased cost of living, coupled with the fact that all of the women interviewed grew all or the majority of their food in Kilimanjaro, whereas 78% of the women interviewed now exclusively purchase all of their food (Figure 36). Predominantly, the women interviewed said that they buy their food at markets close to their homes and some of the women said that they use the food from their market stalls to feed their families. Most women indicated that in Dar es Salaam they purchased food every day. Those who bought some of their food back in Kilimanjaro primarily bought rice or meat and had to travel far to get to the market or shops where they purchased it. Frequency of food purchases was significantly less in their communities of origin.

Figure 35: Cost of Food in Dar es Salaam Compared to Kilimanjaro

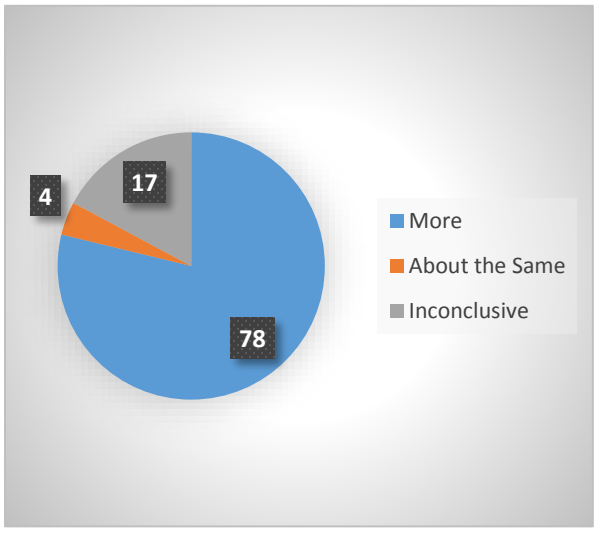
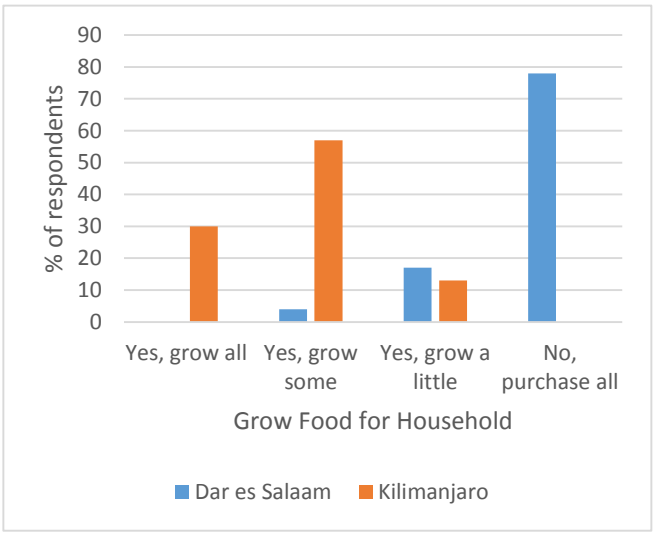


Figure 36: Acquisition of Food in Dar es Salaam Compared to Kilimanjaro



Availability is the presence of food, which includes domestic production, commercial venues and aid, while *access to food* is a household's ability to acquire adequate amounts of food, through means such as home production, purchases and borrowing. *Utilization of food* refers to the ability of household members to use the food to which they have access; s*tability* is recognizing that food security situations may change, therefore people are still considered to be food insecure even if they have periodic inadequate access to food (WFP, 2013). Purchasing food instead of growing it does not necessarily make a person or household more food secure per se, the overall interview responses indicate that women have greater access to food after migrating to Dar es Salaam and that there is greater overall availability of food for their households now.

Finding 3: Migration has marginally improved well-being regarding access to education and/or educational attainment for women and female-headed households.

Some of the women interviewed (13%) came to Dar es Salaam specifically to attend school and a few mentioned that they hoped to have the opportunity to go back to school. At the time of the interview, these women did not have children and were neither not married nor were they determined to be heads of their households. Most of the women interviewed (78%), however, had children. Those who didn't have children predominantly were the young, single women who had migrated to Dar es Salaam for school. Of the women with children, two-thirds (67%) of them had at least one child in school. Of the 33% who didn't have any children in school, only one woman said that her ten year old child was not in school due to household income. For the rest, their children were either too young to attend school or too old and had already completed school. For the women with at least one child attending school, their children between the ages of 7 and 17 years old were generally found to be in school. One woman with three children (ages 12, 11 and 9) only had her

youngest child still in school. One woman said that her parents pay for her 11 year old son to go to school.

Responses were mixed on whether or not they or their households had greater access to education by living in Dar es Salaam. Predominantly they were using the educational services available in the city and many indicated at least a similar level of access to education after migrating, but 65% of the women interviewed (whether or not they have children in school) remarked on how expensive educational services are in the city. Of the women with at least one child attending school, one-quarter (25%) of them had sent one or more of their children back to their community of origin to attend school because it was less expensive there. Only two women commented on the quality of schools in Dar es Salaam, saying they weren't as good as back home. "Schools here are crowded with a poor student-teacher ratio and poorly behaved students," one said.

Overall, barely more than half (57%) of women interviewed believed that as a result of their migration they now had equal or greater access to education compare to prior to migrating, with 43% saying they now had less access or couldn't afford educational services in Dar es Salaam. These findings demonstrate that there is a slight increase in well-being for women and female-headed households regarding access to education as a result of rural-urban migration, but that there is also opportunity for improving accessibility of education to women and their households.

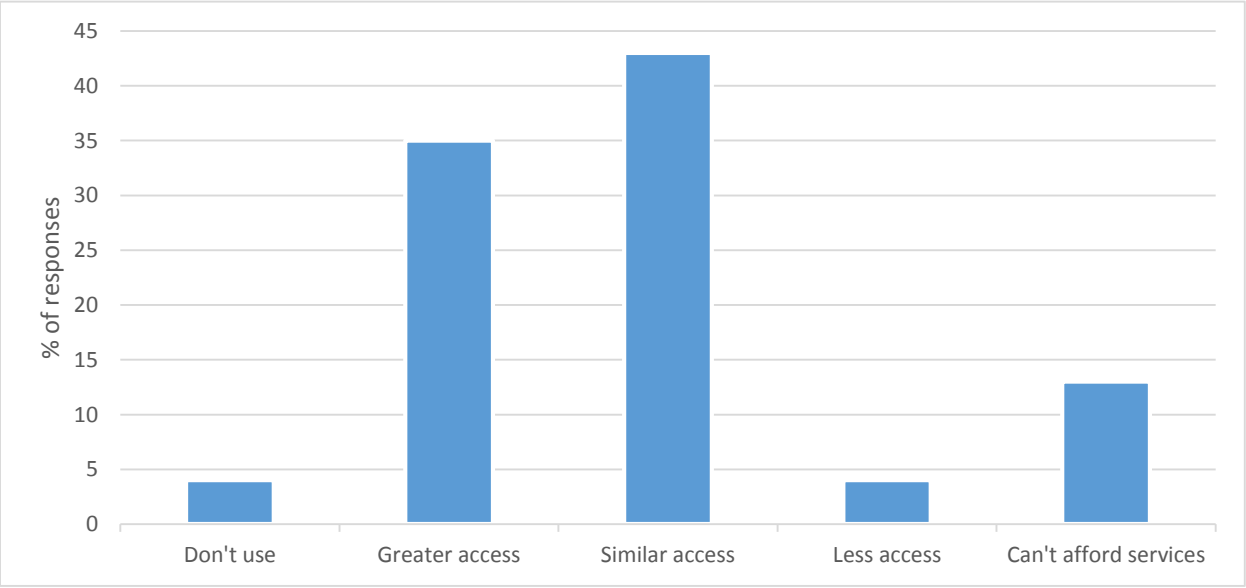
Finding 4: Migration has not necessarily improved well-being regarding health care for women and female-headed households.

When asked if they and the people in their households are healthier now, there was a slight margin indicating that health had improved (48%) since migrating to Dar es Salaam, compared to those who said it had remained the same (22%) or decreased (30%). The responses as to why health

had improved generally indicated an overall better quality of life in Dar es Salaam, referencing less strenuous working conditions coupled with having greater purchasing power that enabled them to now purchase shoes and clothes. Some attributed their improved health to the climate and said that there was less illness and disease in Dar es Salaam compared to their sending communities. Those who said that their household members were less healthy after migrating to Dar es Salaam attributed it to either the change in climate (specifically the heat and humidity in Dar es Salaam) or increased exposure to chemicals, both in the foods they now eat and due to the concentration of industries and chemicals in their working environments.

Most women indicated that they had greater or at least similar access to health care services in Dar es Salaam compared to what the experienced in their communities of origin (Figure 37), and most women responded (63%) that they use health care services available in Dar es Salaam. Those who don't use available health care services indicated it was primarily either because they don't need them or they are too expensive.

Figure 37: Access to Health Care Services



Finding 5: Migration has improved well-being for women and their households as reflected by the response that the majority of the women interviewed are choosing to stay in Dar es Salaam and do not plan to return to their community of origin.

Over half (57%) of the women interviewed said that they will stay in Dar es Salaam and do not plan to move back to their communities of origin (Figure 38). This was particularly notable in the respondent who were married: 82% of whom indicated that they plan to stay in Dar es Salaam, 64% said they will never go back to their communities of origin and 27% were uncertain about returning. Half of the women who were determine to be the head of their household indicated that they planned to remain in Dar es Salaam and will never return to their sending communities, while 33% of single women planned to return after earning enough money or completing school and 33% planned to never go back.

Just as a significant portion of the women when asked, "why did you come to Dar es Salaam" responded "to find a [better] life," the most common reasons for wanting to stay in Dar es Salaam was that they were invested in the life they had built there and have greater opportunities available to them in the city, specifically regarding employment opportunities (such as the ability to own their own business) and opportunities to own a land and house. Among reasons given for wanting to return to Kilimanjaro, none of the women interviewed stated living conditions or well-being as contributing to why they wanted to leave. Almost all of those interested in returning to their communities of origin stated wanting to be close to family who were still there as their primary reason for wanting to return and they mostly planned to do so after completing school or earning enough money (Figure 39). Some women said that they wanted to stay in Dar es Salaam because they were unable to own land in Kilimanjaro due to their family's practice of only allowing men in the family to inherit land, whereas in Dar es Salaam they were able to buy a house. This reaffirms that migrating to Dar es Salaam has

provided women with greater decision making opportunities and access to additional resources which in turn have improved their well-being and ultimately the well-being of their households.

Figure 38: Plans to Return to Sending Community or to Stay in Dar es Salaam

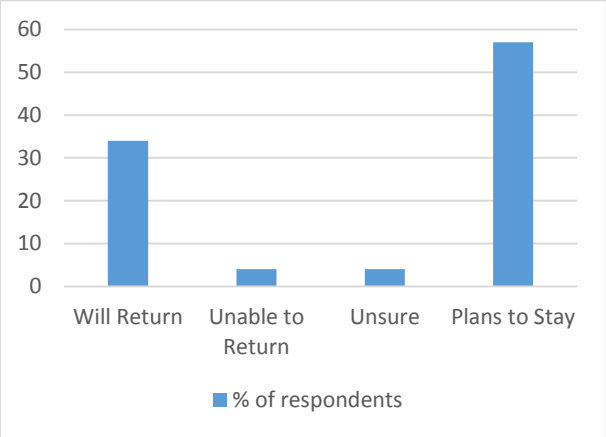
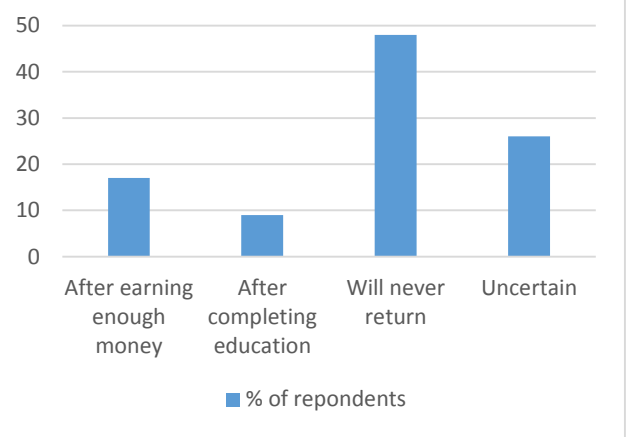


Figure 39: When Respondent Plans to Return to Sending Community



7. **DISCUSSION**

In this chapter, the implications of the interviews and research findings are discussed.

Prior to conducting fieldwork and interviews, the hypothesis was that the rapid urbanization of Dar es Salaam, which has resulted in widespread informal housing settlements lacking basic services and infrastructure, combined with culturally embedded discrimination against women, regarding access to education and types of employment, has prevented female migrants and female-headed households from improving their livelihoods, well-being and food security, despite having improved access to services, such as health care and education, as a result of having migrated to Dar es Salaam. The results of the interviews conducted generated the understanding that well-being is increased for women and their households who migrate from the Kilimanjaro region to Dar es Salaam. The research questions and respective findings are summarized in Table 7.

Although it was apparent that the women interviewed continue to face a multitude of challenges as business owners maintaining stalls at the various markets where our interviews were conducted, many of the women spoke of the contrast between their livelihoods now compared to in their communities of origin. A woman described the difference as that she can "earn money here; [she] can eat here. Back home, they worked hard for no money." Another woman said that here she can "work *and*[11] rest. There was no rest back home."

[11] Emphasis added by author.

Table 7: Summary of Research Questions and Results

Research Questions	Finding 1	Finding 2	Finding 3	Finding 4	Finding 5
Why are women and female-headed households moving to Dar es Salaam?	Women are migrating from the Kilimanjaro region to Dar es Salaam in search of greater economic opportunity and life change, despite the existence of the gap in the perception of greater economic opportunity and reality.	Women who are migrating to Dar es Salaam from the Kilimanjaro region are not necessarily making the decision to do so on their own and usually have support networks in both sending and destination communities.			
What is the role of climate change in the decision to migrate?	Climate change in the Kilimanjaro region is altering agriculturally-based livelihoods across the region, with implications for food security and population mobility.				
Is migration improving their well-being, specifically food security, and the well-being and food security of their households?	Migration has increased food security for women and their households as reflected by the variety of foods they are able to consume in Dar es Salaam.	Migration has increased well-being as measured through greater food security for women and their households through increased access to food in Dar es Salaam.	Migration has marginally improved well-being regarding access to education and/or educational attainment for women and female-headed households.	Migration has not necessarily improved well-being regarding health care for women and female-headed households.	Migration has improved well-being for women and their households as reflected by the response that the majority of the women interviewed are choosing to stay in Dar es Salaam and do not plan to return to their community of origin.

Overall, the interview results confirmed many aspects of existing migration literature. At the same time, however, there were some responses to the interview questions that were unanticipated by the researcher. The most significant unanticipated response was, perhaps, when 30% of the women answered without hesitation that they came to Dar es Salaam to "find a life" or "to find a better life." When considering married women alone, 45% of participants indicated this as their reason for migrating. This response perhaps embodies the spirit of migration. While it captures all the aforementioned conditions and desires – seeking [better] employment, opportunities for education, the ability to own property – it also speaks of a greater desire for independence, autonomy and opportunity. Their response conveys both the hardships that pushed them from home and the hopes of unknown possibility that pulled them to seek out something new.

Predominantly, migration literature and research focuses on the pushes and pulls that cause a person or a group of people to relocate, temporarily, seasonally or permanently. Attention is paid less often, however, to the ramifications of population mobility *after* migrants arrive to destination communities. Using the case study of Tanzania, the researcher – as an urban planner – sought to understand these ramification, recognizing the resource ramifications of urbanization but aiming to give a voice to the experiences of those who migrate, with particular emphasis on to the quality of life for migrants after having arrived in urban areas. Women were selected as the population group for this research because they are often among the most vulnerable members of societies, due to the additional challenges and constraints they inherently must confront as a result of political, cultural and economic systems. Therefore, the contribution of this research is twofold: (1) giving a voice to the experiences of women who participate in rural-urban migration; and (2) understanding how rural-urban migration impacts the well-being for women who choose to migrate, as well as the well-being of their households, *after* they have migrated.

There are a number of urban planning and policy implications to be considered in response to the survey outcomes, specifically examining current planning and policy measures that impact the ability of women and female-headed households to access basic services and opportunities. Rapid population growth, as currently being experienced by Dar es Salaam, is challenging for municipalities to plan for adequately to ensure equity, access and opportunity for all residents. There are opportunities to improve well-being and the quality of life for women and to improve their well-being and the well-being of their households. This includes better infrastructure and services, such as sanitary sewer, drinking water and housing. However, a comprehensive understanding of rural-urban migration occurring – specifically incomplete data on those who come to Dar es Salaam – remains a significant barrier to addressing these needs.

Johnston and Mellor (1961) advocate for policies which promote a balanced growth approach to development, encouraging investment in both agricultural and industrial development; they assert that structural transformation benefits the country as a whole in the long-run when the interests of the farm population is not overlooked (Johnston & Mellor, 1961). As such, policy makers have the opportunity to approach the rural-urban migration that is occurring from two main perspectives: (1) that of rural development, investing in infrastructure and diversifying the economies in rural areas in order to promote the success of smallholder agricultural households, of whom the majority of rural areas is still comprised; or (2) increasing investment in housing, education and basic services for urban areas, in order to offer a better quality of life for those who migrate to cities, certifying that they are able to make productive contributions to the workforce and economy.

Rural development measures should start with basic infrastructure, specifically roads, water and electricity; this will reduce input and transaction costs for smallholder agricultural households, as well as increasing the quality of life for those living in rural communities and areas. Improving access

to credit markets is another policy approach that can improve livelihoods for agricultural households and promote agricultural intensification, which is a fundamental component of structural transformation. After investing in infrastructure, policy should focus on raising human capital through increased access to and availability of education and health services. By doing so, the rural population will be more equipped not only to be more productive laborers, but also for the innovation required to diversify the rural economy, which ultimately has the potential to diminish the push factors of rural-urban migration.

If structural transformation is to be successful, it is imperative that there are resources and mechanisms in place to ensure that those who have migrated to urban areas have the opportunity to thrive once they arrive. Barrett et al. (2010) view structural transformation as the requisite change for taking a billion-plus people out of chronic poverty and hunger. Therefore, investing in housing, education and basic services in receiving communities ought to be a priority for policy makers. Greater access to education will ensure a strong, diversified workforce for urban centers. Similarly, improved housing and basic services, including health care and sanitation infrastructure, are necessary for a strong labor force. Migration-friendly policies promoted by the Tanzanian government that assist with expediting the shift of labor out of agriculture and into the industrial sector will do well not only for national economic growth, but improving the overall well-being of the country's population.

Infrastructure plays a crucial role in achieving food security. The Tanzanian Ministry of Agriculture, Food Security and Cooperatives (MAFC) in 2013 recorded a national food surplus of 2 million tons, with total food production at 14,383,845 tons. Yet, at noted previously, as much as half of Tanzania's population is unable to meet its basic nutritional needs (FTF, 2012). Among many factors contributing to this disparity, in the case of Dar es Salaam, the MAFC show the food deficit

occurring at the household level is due in part to: (1) high post-harvest lost experienced by farmers and (2) the gap between household incomes and the cost of food.

According to the MAFC, the Dar es Salaam food shed consists of the entire country, as the metropolitan area does not produce enough food on its own and therefore must import food from other areas of Tanzania; food can cover distances as great as 1,000 kilometers before reaching Dar es Salaam. There are significant systematic challenges associated with the current structure of this model, as Tanzania lacks sufficient, necessary inter-regional infrastructure – specifically, storage facilities, roads and railways – in order to effectively transport food from producing areas of the country to consumption in Dar es Salaam. The high rate of waste from production areas to markets results in driving up food prices. This impacts women on both the upstream and downstream ends of the food chain.

Downstream are the women interviewed for this research, who purchase the produce from the intermediary (who purchased the product from the farmers and brought it to be sold in Dar es Salaam). Many of them discussed the challenges they face in their ability to make a profit, as often they purchase their produce at high prices but must sell them at significantly lower prices (women selling clothing remarked on the same challenge). Minimizing waste during the transport process provides the opportunity to keep prices lower, augmenting both the purchasing power and ability to make a profit for vendors in Dar es Salaam, such as the women included in this case study[12].

From an upstream perspective, going back to the women who produce food in other regions of the country, the perception of risk for transaction costs impacts prices offered to farmers by intermediaries, such as traders, who take their produce to Dar es Salaam to sell. According to the

[12] *Source: Tanzania Ministry of Agriculture, Food Security and Cooperatives, 2014*

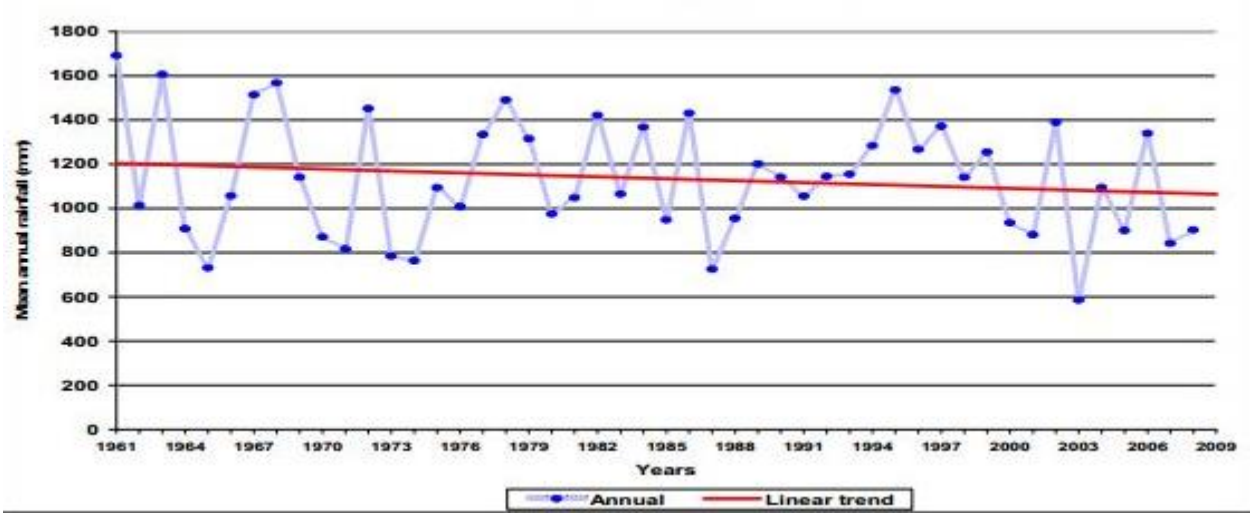
MAFC, female farmers in rural areas tend to have low educational attainment and often lack comprehensive information as to at what price they should sell their crops. There is the perception that farmers don't have extensive bargaining power for the prices at which they are to sell their crops. Better infrastructure both reduces transactions costs and increases access to and the availability of information that will in turn assist in providing better prices to female farmers.

While, migration has improved women's status and access to resources, female rural-urban migration has only changed women's status from extreme poverty to poverty (Khasiani & Okoth-Okombo, 1995). Holler (2014) argues that sustainable measures of well-being cannot be achieved without reconfiguring dominant institutions which dictate not only development, but access to and control over resources; this, he maintains, must be accomplished through reconstructing dimensions of gender, class and other factors perpetuating the marginalization of specific population groups. There are numerous opportunities for the City of Dar es Salaam to improve the quality of life and well-being of the people who live in the city, and looking forward to those who will move there in the future. Currently, the City of Dar es Salaam faces significant challenges in keeping up with the rapid population occurring in order to provide or maintain public services infrastructure, such as sanitary sewer and drinking water. Already, 70% of the people living in Dar es Salaam lack access to basic sanitation infrastructure and social services, including [clean] tap water and sewage systems (Jacobi, Amend & Kiango, 2000). Many of this population within the city are the extremely impoverished, and it is believed that frequently migrants who arrive in Dar es Salaam start out living in such unplanned settlements. In these residential areas, clean water as an amenity is not readily available and

the lack of access to clean water and basic sanitation poses a severe health risk and often contributes to widespread illness in the city[13].

The United Nations recognizes the right to clean drinking water and sanitation as a basic human right – where access to clean water is understood to be when all people have access to sufficient and safe, affordable water that is physically accessible for personal and domestic uses[14]. Access to adequate, clean water is a challenge currently faced by Tanzanians across the country – not limited to Dar es Salaam – and is anticipated to intensify with future impacts of climate change, either through increasing scarcity with the onset of more frequent droughts or through the environmental degradation and infrastructure damage that occurs as a result of flooding (Figure 40)[15]. Dar es Salaam's

Figure 40: Mean annual rainfall in Dar es Salaam



Source: Tanzania Meteorological Agency, 2010

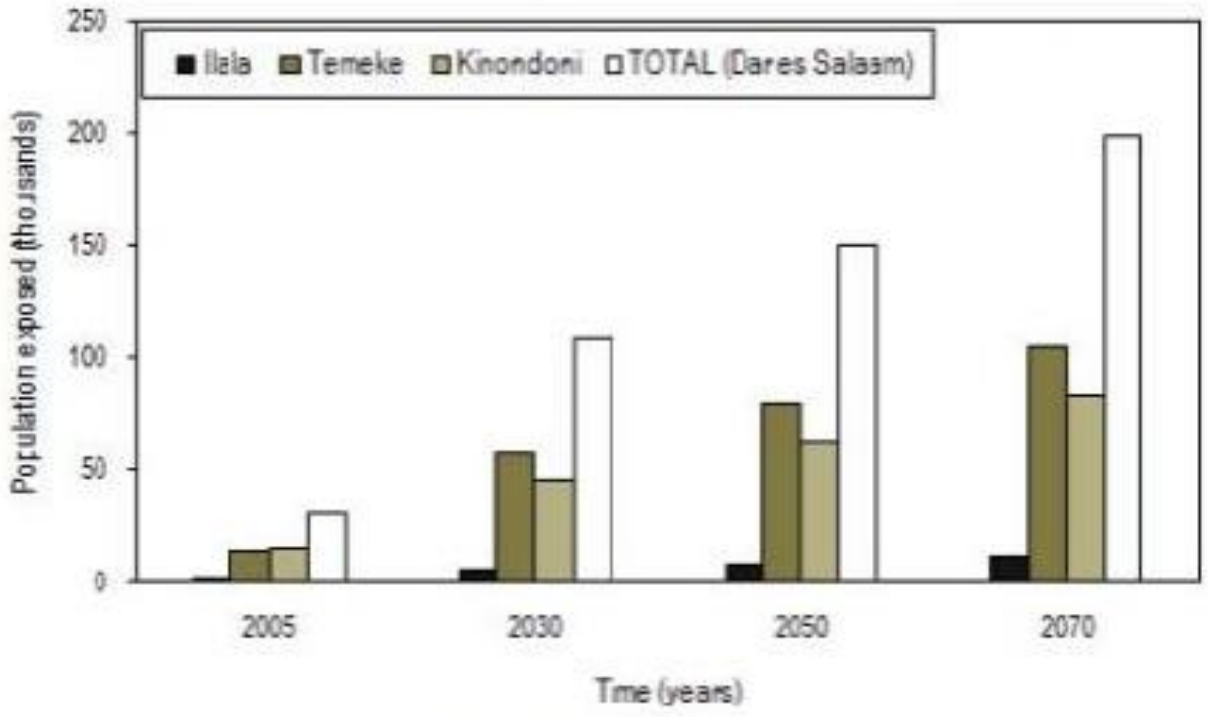
[13] Dar es Salaam case study overview: climate change, disaster risk and the urban poor: cities building resilience for a changing world. (nd). http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1306291319853/CS_Dar_Es_Salaam.pdf

[14] UN International Decade for Action 'Water for Life' 2005-2015. http://www.un.org/waterforlifedecade/human_right_to_water.shtml Retrieved December 30, 2014.

[15] http://tz.one.un.org/index.php/what-we-do/water-sanitation-and-hygiene-wash?showall=1&limitstart=

location along the coast makes it particularly vulnerable to damage from sea-level rise and other threats associated with intensified rainfall variability (Figure 41)[16].

Figure 41: Population in Dar es Salaam exposed to a 100 year flood event



Source: Tanzania Meteorological Agency, 2010

From a planning perspective, there are significant water infrastructure investments that the City of Dar es Salaam needs to focus on implementing, primarily: (1) ensuring its ability to provide adequate, clean water supplies for *all* of its citizens; and (2) investing in measures to safeguard infrastructure and water resources against future threats of climate change induced degradation.

An element of well-being that was not addressed in this case study is that of housing conditions. The unplanned housing settlements and structures that are being added to the urban landscape of Dar es Salaam, due to its rapid urbanization, are considered to contribute to the city's

[16] http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1306291319853/CS_Dar_Es_Salaam.pdfhttp://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1306291319853/CS_Dar_Es_Salaam.pdf

increased vulnerability to impacts of climate change because they are often located in low-lying areas vulnerable to flooding (Awuor, Orindi & Adwera, 2008). Outside of flooding vulnerability, housing-oriented policy must focus on the quality of housing that is available to women who migrate to Dar es Salaam. A broader approach to housing policy could influences the existing systems that contribute to the need for and development of unplanned settlements in Dar es Salaam and should focus on both the availability of affordable housing and zoning and designated land-use regulations. There is an opportunity for policy makers to plan for and better adapt to the in-migration and population growth occurring in Dar es Salaam, and in turn better promote and support the public good and well-being through zoning and land-use regulation, as well as assuring the provision of affordable housing options in the city.

While the extent to which migration is occurring in Tanzania is indicative of the freedoms that accompany such ease of mobility, the rate at which internal is taking place implies unequal economic opportunity and access to resources between regions (NBS, 2015). The Kilimanjaro region has one of the highest out-migration rates due to high population pressure and resulting environmental degradation (NBS, 2015). As such, policy makers may find encouraging out-migration from this region beneficial in order to achieve established national development frameworks and efforts towards climate change mitigation, in order to minimize future land degradation (NBS, 2015).

Tanzania's current national policies pertaining to climate change adaptation regard vulnerabilities to climate change from a perspective of potential impact to key economic sectors (United Republic of Tanzania NAPA, 2007; Smucker et al., 2015). With agriculture as the predominant economic activity, the National Adaptation Program of Action (NAPA) places particular emphasis on short and long term actions that will sustainably address future needs of agrarian populations and practices (United Republic of Tanzania NAPA, 2007). The seven (7) main NAPA

objectives focus on protecting life and livelihoods and creating long-term, sustainable development activities in the face of changing climatic conditions that respect people, infrastructure, biodiversity and the environment (United Republic of Tanzania NAPA, 2007). Additionally, the National Climate Change Strategy (NCCS) adopted in the year 2012, seeks to raise awareness and enhance capacity of communities of all levels across the country in their ability to participate in and benefit from climate change mitigation and sustainable development (United Republic of Tanzania, 2012).

In addition to focusing on the correlation between population pressures, environmental degradation and climate change, future policy must examine the challenges associated with sustaining a high rate of migration to concentrated destination urban areas, such as Dar es Salaam, and the strain on available resources, services and infrastructure that may not be designed to handle the over-use resulting from rapid population growth (NBS, 2015). The inability of services, resources and infrastructure to keep pace with urbanization has been found to lead to increased informal housing settlements that lack electricity and sanitation (NBS, 2015). According to the NBS, "Over 70% of urban dwellers live in unplanned settlements with inadequate road, transport, housing, water, sewerage and sanitation, electricity and other services, and the unemployment rate is high, especially among the youth (2015, p. 66)." Therefore, it would benefit future policy to attain a balance between addressing the needs of both sending and destination communities (NBS, 2015).

Encouraging development across the country – in rural and urban areas alike – may lessen disparities between sending and destination communities, and diminish the strain of resources experienced in destination urban areas – specifically Dar es Salaam – due to rapid urbanization (NBS, 2015).. Investing in educational opportunities – ranging from facilities for primary education to vocational and technical schools – is seen by policy makers as having great potential for reducing migratory movements (NBS, 2015). Such efforts must also include developing rural-based market

centers in order to provide diverse opportunities for productive livelihoods (NBS, 2015). This may include efforts by the government to bring commerce activities in the informal sector into the formal sector (NBS, 2015).

Access to credit is imperative for those who migrate to urban centers; this includes access to capital for those who pursue starting or growing their own businesses as well as providing a diversity of jobs for those who migrate due to the pull of greater educational opportunities. The challenge of acquiring capital was a repeated theme throughout the interviews, and many women worked multiple jobs before they were able to save up enough money to open their own business. All of the women interviewed spoke with great pride about the businesses they own and many of them spoke of aspirations to one day leave the market and open a shop, one where they could employ others and be a "big business" woman.

In analyzing the interview responses, it became apparent that the researcher had a different concept of well-being than the women being interviewed. While the research perceived well-being from a fundamental standpoint (health, access to food, gainful employment, educational attainment), the women who were interviewed incorporated independence into their definition of well-being. The women who come to Dar es Salaam seeking "to find a life" migrate in search of self-governance. They own their own businesses; they decide how their own income is spent. In a rural culture where the economy is predominantly tied to agriculture, the residual practice of excluding women from land inheritance denies women the requisite resources for their autonomy. Instead of working in agriculture on land that belongs to their father, brother, husband or other relative, women who migrate to Dar es Salaam have greater opportunity to become business owners, opportunity in decision making (such as how income is spent and health care decisions), and ultimately greater control over their own lives. When asked about well-being and if their lives were better now, having moved to Dar es Salaam,

the independence achieved through migration should not be underestimated in the responses that indicated, yes, life is better as a result of rural-urban migration.

Additionally, the importance of social networks in female rural-urban migration should not be undervalued; 91% of the women interviewed knew someone when migrating to Dar es Salaam. Most women (74%) had family who either already lived in Dar es Salaam or migrated with them; some women knew someone, predominantly neighbors, from her hometown (13%) and a few had friends (4%) who had already migrated to Dar es Salaam. This directly aligns with previous literature on rural-urban migration that discusses the role that social networks play in facilitating rural-urban migration due to how significantly risk associated with migration diminished by knowing someone in the destination community. Additionally, after arriving in urban areas, it is not uncommon for migrants to use their social networks in order to secure housing and employment.

Perhaps the greatest challenge is that, at this juncture, is the extensive lack of reliable migration data for many parts of the world (Laczko & Aghazarm, 2009; Renaud, Dun, Warner & Bogardi, 2011). This is partially attributed to the frequent dependence on census data for understanding migration (which has severe limitations, particularly concerning the seasonal movement of groups of peoples), because the countries most affected by migration often lack access to modern methods of data capture, modeling and analysis (Henry, Boyle & Lambin, 2003; Verdin et al, 2005). Countries ought to be able to assess their own specific vulnerability to climate change and develop policy oriented toward local and regional adaptation (Huntingford et al, 2005; Thomas & Twyman, 2003).

Once better data is obtained, analysis needs to be able to separate environmental factors from other migration drivers, as well as better identify both how migration contributes to climate change and to efforts to adapt to it (Laczko & Aghazarm, 2009). Policy geared only toward economic drivers of migration alone does not – at this time – address the growing vulnerability of populations in

developing countries as a push factor for future migration (Adger et al, 2003; Renaud, Dun, Warner & Bogardi, 2011). Future policies need to view climate change and migration in the context of being intrinsically linked and as an essential area of focus for both adaptation and coordinated development efforts (Laczko & Aghazarm, 2009; Tacoli, 2009). It will become increasingly crucial for destinations – such as Dar es Salaam – to have policies in place to manage the admission and resettlement of persons unable to return to their communities of origin, while still ensuring a high quality of life for them and all residents alike in destination communities (Martin, 2010; Renaud, Bogardi, Dun & Warner, 2007).

8. CONCLUSION

The purpose of this research was to examine female rural-urban migration, using the case study of Tanzania, studying women who leave rural communities in the northern region of Kilimanjaro to go to the city of Dar es Salaam. This case study was used to determine if migration does in fact improve the well-being of the women who migrate and the well-being of their households. Women were chosen as the focus of this research because of the additional challenges they face as a result of the cultural norms which prevent their equitable access to resources such as education, credit for start-up capital and land ownership. Although there is a wealth of literature and research dedicated to rural-urban migration, studying female migrants exclusively has not been as thoroughly examined and rarely are their experiences upon arriving in destination cities documented. From a planning and policy perspective, this research provides a crucial understanding about the quality of life available to women arriving in mega cities in developing countries, such as Dar es Salaam. This information can be utilized to ensure that cities offer equity, opportunity and inclusion for all their residents and those who are seeking to be residents.

Prior to conducting fieldwork and interviews, the hypothesis was that the rapid urbanization of Dar es Salaam, which has resulted in widespread informal housing settlements lacking basic services and infrastructure, combined with culturally embedded discrimination against women, regarding access to education and types of employment, has prevented female migrants and female-headed households from improving their livelihoods, well-being and food security, despite having improved access to services, such as health care and education, as a result of having migrated to Dar es Salaam. The results of the interviews indicated, however, that well-being had increased for women and their households due to migration.

Areas of well-being that were focused on during the interviews that were conducted included gainful employment, household food security and access to educational and health care services. Based on the responses to questions regarding food access and consumption, the majority of the women interviewed answered in such a way that it may be concluded that their households are more food secure in Dar es Salaam than they were in Kilimanjaro (or at least less food insecure). This aligns with literature surrounding rural-urban migration, along with other studies conducted in East Africa. Khasiani and Okoth-Okombo (1995), for example, conducted a study on female migration in Kenya and found women who had migrated to be more food secure than women who had not migrated (p. 70).

The findings regarding remittances and the decision to migrate support a number of concepts discussed in migration literature: (1) that the decision to migrate is primarily made at the household level; (2) households invest in family members with potential to remit earnings; and (3) female migrants tend to remit significant portions of their income to family members who remain in their sending communities. Also aligned with migration literature, multiple women cited their lack of education as a challenge to finding employment when they first arrived in Dar es Salaam; therefore, the 13% of women who came to Dar es Salaam for schooling are also improving their prospects for better economic opportunity, as higher educational attainment enables wider range of prospective employment, as well as the probability of higher wages.

Many of the women who said that they planned to stay in Dar es Salaam and not return to their communities of origin in Kilimanjaro said that their ability to own land and a house in Dar es Salaam was why they intended to stay. More than 40% of the women interviewed specifically mentioned owning a house in Dar es Salaam as why they planned to stay. Multiple women described how – in their communities of origin – their families won't distribute land to women. Additionally,

in rural areas, upon marrying, women will move to their husband's family's land, to which they have no claim of ownership. The inability to own land where the local economy is predominantly agriculturally based severely limits livelihood prospects and served as a push factor for the women who migrated to Dar es Salaam, where economic activity is not dependent on land.

A response that was unanticipated by the researcher occurred when 30% of the women interviewed answered without hesitation that they came to Dar es Salaam to "find a life" or "to find a better life." Among married, 45% indicated this as their reason for migrating. This response perhaps embodies the spirit of migration and captures all the aforementioned conditions and desires – seeking [better] employment, opportunities for education, the ability to own property – and more. Their response conveys both the hardships that pushed them from home and the hopes of unknown possibility that pulled them to seek out something new.

There continues to be significant gaps in the data examining the relationship between gender, migration and climate change. As populations continue to move to urban centers, better understanding of the interrelationships of these phenomena will be essential to utilize sustainable development practices and policies and achieve better equity and social well-being. It can be understood that their well-being and the well-being of their household has improved as a result of the migration. However, there is still ample opportunity to further improve their well-being, in regards to household food security, as well as other measurements of well-being, through measures such as increased access to credit for starting businesses, improved access to health and education facilities and services and enhanced preparation for climate related events in order to mitigate food insecurity.

First, greater availability and access to credit, such as *vikoba*, so that women may obtain start-up capital is a policy area that has potential to improve welfare and livelihoods for female migrants once they have arrived in Dar es Salaam. The majority of the women interviewed were small business

owners: they own their stalls at the markets. A repeated theme throughout the interviews was difficulty in accessing capital to initially start or expand their businesses. Many of the women interviewed intend to continue to save and acquire capital so that they may move out of the markets and open their open shop someday. Shops are viewed as more prestigious and shop owners are able to demand higher prices than those who sell in the markets.

Only one of the women interviewed referenced belonging to a *vikoba*, or women's association. The intention behind such organizations is that women pool together their resources to provide access among the group to resources they otherwise wouldn't be able to obtain. A potential policy measure could be to focus on strengthening and growing such groups across the city, as well as working to ensure that women who migrate to Dar es Salaam are aware of them and are able to participate in a *vikoba*.

Second, policy measures assisting women in accessing the education and health care services will improve the economic stability of women who migrate to Dar es Salaam and further increase their food security and well-being, which in turn will increase the food security and well-being of their households. The women interviewed consistently remarked on the high costs of education and health care services. Greater access to educational service doesn't necessarily have to come in the form of a college degree, but can also be targeted programs to educate women about owning a business and finance.

Third, it would be prudent for policy makers to start preparing now for increasing droughts and climate variability, which are not only predicted to continue to occur, but are anticipated to become additional stressors to existing issues of food insecurity and inequality, malnutrition, disease and natural disasters (Awuor, Orindi & Adwera, 2008; Pavola, 2008). Currently, the majority of policies that address both climate change and migration are focused solely on emergency responses

(Laczko & Aghazarm, 2009). However, addressing current and near term future risks will require an integrated approach to the development process: one that incorporates aspects of climate change into spatial planning; re-evaluates current formal funding mechanisms to account for future scientific technical, existing infrastructure, economic social and political factors; and provides the opportunity to create, test and maintain adaptive capabilities.

Finally, I would like to highlight several limitations of this research. First, there remains significant gaps in the knowledge pertaining to a comprehensive understanding of all factors contributing to female migrants' well-being and the well-being of their households in Dar es Salaam, and numerous well-being measures were not addressed in the interviews associated with this research. For instance, household income was not broached in the interviews but is a fundamental factor in determining well-being. Future research and policy ought to ensure that women who migrate to Dar es Salaam are able to earn a living wage, as this is a critical element to obtaining household food security and overall health and well-being. Additionally, the availability and quality of housing for women and their households who migrate to Dar es Salaam was not addressed in this research. There remains ample opportunity for planners, researchers and policy makers to continue to improve the quality of life for women and their households who have migrated to Dar es Salaam.

APPENDICES

Appendix A:

Figure 42: In-, Out- and Net Migration for Regions of Tanzania in 2002 and 2012

Region	2002			2012			Percent Change Net Migration 2002-2012
	In-Migrants	Out-Migrants	Net Migrants	In-Migrants	Out-Migrants	Net Migrants	
Tanzania	**5,304,209**	**5,304,209**	**0**	**7,354,920**	**7,354,920**	**0**	**0%**
Tanzania Mainland	**5,044,080**	**5,050,913**	**-6,833**	**7,067,909**	**7,077,211**	**-9,302**	**36%**
Dodoma	139,808	321,276	-181,468	163,320	506,471	-343,151	89%
Arusha	264,978	183,250	81,728	309,834	241,974	67,860	-17%
Kilimanjaro	**148,238**	**411,735**	**-263,497**	**155,328**	**559,922**	**-404,594**	**54%**
Tanga	132,087	294,130	-162,043	165,301	462,644	-297,343	83%
Morogoro	284,542	210,282	74,260	397,682	372,219	25,463	-66%
Pwani	189,204	245,454	-56,250	276,965	342,639	-65,674	17%
Dar es Salaam	**1,208479**	**237,446**	**971,033**	**2,266,013**	**269,126**	**1,996,887**	**106%**
Lindi	100,020	179,293	-79,273	81,381	229,253	-147,872	87%
Mtwara	53,102	186,911	-133,809	58,836	237,751	-178,915	34%
Ruvuma	85,799	138,289	-52,490	82,657	145,028	-62,371	19%
Iringa	79,869	299,189	-219,320	95,089	241,075	-145,986	-33%
Mbeya	239,644	171,692	67,952	271,674	225,993	45,681	-33%
Singida	104,623	255,894	-151,271	149,572	261,853	-112,281	-26%
Tabora	353,132	243,720	109,412	468,921	298,886	170,035	55%
Rukwa	113,954	75,241	38,713	93,809	103,527	-9,718	-125%
Kigoma	85,424	238,345	-152,921	98,412	337,996	-239,584	57%
Shinyanga	455,087	390,367	64,720	265,388	532,756	-267,368	-513%
Kagera	201,483	176,312	25,171	187,256	222,404	-35,148	240%
Mwanza	417,872	437,209	-19,337	384,347	528,640	-144,293	646%
Mara	108,263	299,432	-191,169	104,539	284,932	-180,393	-6%
Manyara	278,472	55,446	223,026	213,798	114,404	99,394	-55
Njombe	NA	NA	NA	47,251	151,240	-103,989	NA
Katavi	NA	NA	NA	198,107	35,950	162,157	NA
Simiyu	NA	NA	NA	99,400	219,317	-119,917	NA
Geita	NA	NA	NA	433,029	151,211	281,818	NA
Tanzania Zanzibar	**260,129**	**253,296**	**6,833**	**287,011**	**277,709**	**9,302**	**36%**
Kaskazini Unguja	20,684	54,746	-34,062	19,604	58,245	-38,641	13%
Kusini Unguja	27,568	36,471	-8,903	26,005	45,922	-19,917	124%
Mjini Magharibi	170,698	51,496	119,202	214,668	36,174	178,494	50%
Kaskazini Pemba	19,728	61,199	-41,471	14,064	66,189	-52,125	26%
Kusini Pemba	21,451	49,384	-27,933	12,670	71,179	-58,509	109%

Source: NBS, 2015

Appendix B:

Figure 43: Survey Tool Utilized for Conducting Interviews

Interview Questions (migration):

How long have you lived in Dar?	Less than six months	6 months – 1 year	1-2 years	2-5 years	5 years or more
Did you move here from:	village	small town	mid-sized town	city	
Why did you leave your home/community	Seek employment	Seek better employment	Schooling		
Who made the decision (for you) to move?	I did	My husband	My parents	My husband's parents	Grandparents
Do you still have family back home?	Yes	No			
Did any of your family move to Dar with you?	Yes	No			
Have you been able to find employment since you moved here?	Yes	No			
YES:					
What is the employment?					
Did you find the job you wanted?					
Are you making the money you expected?					
How long did it take?					
What challenges did you face?					

Figure 43 (cont'd)

NO:

What type of job are you looking for/hoping to get?					
What obstacles have you faced that you feel are preventing you from finding work?					
What are your sources of income?	Formal job	Informal job	Help from relatives		
Compare household income now to before you migrated	Household income has increased	Household income has increased, along with household costs		Household income has remained the same	Household income has decreased
Do you send any money back home?	Yes	No			

YES:

How often?	When I can/intermitted	Once a week	Couple times a month	Once a month	Once every couple months
Did you know anyone when you moved here?	Yes: friends	Yes: family	Yes: someone from my hometown	No: but my friends/family knew someone here	No: I knew no one at all

Figure 43 (cont'd)

Household questions:

How many people live in your household?	Just me	Myself + one other person	Three of us	3 -5 people	More than 5
Household composition:					
Gender					
Age					
Employment status					
Relationship to you					
Are you married?	Yes		No		
Do you have children?	Yes		No		
YES:					
Are they in school?	Yes		No		
If no, why not?					
Who decides how your income is spent?	I do	My husband does	My husband & I decide together	My parents	My in-laws
Who makes decisions regarding health care?	I do	My husband	My husband & I decide together	My parents	My in-laws
Who cooks the food/is responsible for preparing meals?	I am	My daughter(s)	My mother	My mother in-law	

Figure 43 (cont'd)

Food Security

How many meals do you typically eat per day?	More than 3	3	2	1	Less than 1

How often do you eat the following:

Cereals/grains	Every meal	Every day	A few times a week	Once a week	A few times a month	Rarely	Never
Fruits	Every meal	Every day	A few times a week	Once a week	A few times a month	Rarely	Never
Vegetables	Every meal	Every day	A few times a week	Once a week	A few times a month	Rarely	Never
Meat	Every meal	Every day	A few times a week	Once a week	A few times a month	Rarely	Never
Dairy	Every meal	Every day	A few times a week	Once a week	A few times a month	Rarely	Never
Fresh fruit/vegetables	Every meal	Every day	A few times a week	Once a week	A few times a month	Rarely	Never

Figure 43 (cont'd)

Are you eating more or less than you did before migrating (back home)?	**More**	**About the same**	**Less**	**It depends**
Why is that the case?				
Is food here more or less expensive than back home?	More	About the same	Less	It depends
Do you grow any of your own food?	Yes, a lot/most	Yes, some	Yes, a little	No, I buy all my food
Did you grow your own food back home?	Yes, we grew all of our food	Yes, we grew most of our food	Yes, we grew some of our food	Yes, we grew a little of our food	No, we bought all of our food
Where do you purchase your food?				
How far do you have to go to purchase food?				

Figure 43 (cont'd)

How often do you go to buy food?	**Every day**	**A few times a week**	**Once a week**	**Every other week**	**Every few weeks/a few times a month**	**Once a month**
Where did you purchase food back home?						
How far did you have to go to purchase food?						
How often did you purchase food back home?	Every day	A few times a week	Once a week	Every other week	Every few weeks/a few times a month	Once a month
How is your variety of food different now than before you migrated?	More variety now		About the same		Less variety now	
If you had additional financial resources, which foods would you buy more of?	Everything	Fruits	Vegetables	Meats	Dairy	Cereals/ grains
Do you feel you eat better now than you did before migrating?	Yes		Sometimes	It depends	No	

Figure 43 (cont'd)

Other well-being measures

Compare access to education now vs back home?	I have/my household has greater access to education	I have/my household has similar access to education	I have/my household has less access to education	I have/my household has greater/similar access to education, but I don't use it/can't afford it
Compare access to health care now vs back home?	I have/my household has greater access to health care	I have/my household has similar access to health care	I have/my household has less access to health care	I have/my household has greater/similar access to health care, but I don't use it/can't afford it
Do you use these services? (education)	Yes	No	Can't afford them	
Do you use these services? (health care)	Yes	No	Can't afford them	
Are you (and the others in your household) healthier now, compared to before migrating?	Yes	No		
Why?				

Figure 43 (cont'd)

Do you plan to stay in Dar or will you return home?	**I plan to stay (indefinitely)**	**I will stay but plan to return someday**	**I will return**	**I am unable to return**
How long?				
Why?				
Do you know anyone else who has migrated to Dar from Arusha or Kilimanjaro?				

REFERENCES

REFERENCES

Adger, W. N., Huq, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in development studies*, *3*(3), 179-195.

Adepoju, A. (2000). Issues and Recent Trends in International Migration in Sub-Saharan Africa. *International Social Science Journal*, *52*(165), 383-394.

Adepoju, A. (2003). Migration in West Africa. *Development*, *46*(3), 37-41.

Adepoju, A. (2008). Migration and social policy in sub-Saharan Africa.

Ardhi University (2011). Urban poverty and climate change in Dar es Salaam, Tanzania: a case study. Flood modeling conducted by team of R. Kiunsi.

Armar-Klemesu, M. (2000). Urban agriculture and food security, nutrition and health. *Growing cities, growing food. Urban agriculture on the policy agenda*, 99-118.

Arnell, N. W. (2004). Climate change and global water resources: SRES emissions and socio-economic scenarios. *Global environmental change*, *14*(1), 31-52.

Arthur, J. A. (1991). International labor migration patterns in West Africa. *African Studies Review, 34*(3), 65-87.

Awuor, C. B., Orindi, v., & Adwera, A. O. (2008). Climate change and costal cities: the case of Mombasa, Kenya. *Environment and Urbanization, 20*, 231-242.

Bah, M., Cissé, S., Diyamett, B., Diallo, G., Lerise, F., Okali, D., … & Tacoli, C. (2003). Changing rural–urban linkages in Mali, Nigeria and Tanzania. *Environment and Urbanization*, *15*(1), 13-24.

Barnett, J., & Adger, W. N. (2007). Climate change, human security and violent conflict. *Political Geography*, *26*(6), 639-655.

Beauchemin, C., & Bocquier, P. (2004). Migration and urbanization in Francophone West Africa: an overview of the recent empirical evidence. *Urban Studies, 41*(11), 2245-2272. Doi: 10.1080/0042098042000268447

Beegle, K., De Weerdt, J., & Dercon, S. (2011). Migration and economic mobility in Tanzania: Evidence from a tracking survey. *Review of Economics and Statistics*, *93*(3), 1010-1033.

Bilsborrow, R. E. (Ed.). (1998). *Migration, urbanization, and development: new directions and issues*. Springer Science & Business Media.

Black, R., Kniveton, D., & Schmidt-Verkerk, K. (2011). Migration and climate change: towards an integrated assessment of sensitivity. *Environment and Planning-Part A*, *43*(2), 431.

CIA World Factbook (2014). https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html Retrieved September 26, 2014

Collier, P., & Dercon, S. (2014). African Agriculture in 50Years: Smallholders in a Rapidly Changing World?. *World Development*, *63*, 92-101.

Curran, S. R., & Saguy, A. C. (2013). Migration and cultural change: a role for gender and social networks?. *Journal of International Women's Studies*, *2*(3), 54-77.

DeFries, R. Asner, G. P., & Foley, J. (2006). A glimpse out the window: landscapes, livelihoods, and the environment. *Environment: Science and Policy for Sustainable Development, 48*(8), 22-36.

Dietz, T., Ostrom, E., & Stern, P. C. (2003). The struggle to govern the commons. *Science, 302*(5652), 1907-1912.

Douglas, I., Alam, K., Maghenda M., Mcdonnell, Y., Mclean, L., & Campbell, J. (2008). Unjust waters: climate change, flooding and the urban poor in Africa. *Environment and Urbanization, 20,* 187-205.

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, *51*(2), 289-302.

Ellis, F., & Mdoe, N. (2003). Livelihoods and rural poverty reduction in Tanzania. *World Development*, *31*(8), 1367-1384.

Eriksen, S. H., Brown, K., & Kelly, P. M. (2005). The dynamics of vulnerability: locating coping strategies in Kenya and Tanzania. *The Geographical Journal*, *171*(4), 287-305.

Fei, J. C. H. & Ranis, G. (1964). *Development of the Labor Surplus Economy: Theory and Policy.* Homewood, IL: Irwin.

Food and Agriculture Organization (FAO). (2006). The role of agriculture in reducing poverty in Tanzania: a household perspective from rural Kilimanjaro and Ruvuma.

Food and Agriculture Organization (FAO). (2008). Tanzania nutrition profile.

Food and Agriculture Organization (FAO). 2013. Strengthening capacity for climate change adaptation in the agricultural sector in Ethiopia. Retrieved from http://www.fao.org/docrep/014/i2155e/i2155e00.pdf.

Feed the Future (FTF). (2012). http://www.feedthefuture.gov/country/tanzania . Retrieved March 13, 2014.

Gould, W. T. (2008). *Population and development*. Routledge.

Gray, C. L. (2011). Soil quality and human migration in Kenya and Uganda. *Global Environmental Change*, *21*(2), 421-430.

Hadley, C., & Patil, C. L. (2006). Food insecurity in rural Tanzania is associated with maternal anxiety and depression. *American Journal of Human Biology*, *18*(3), 359-368.

Henderson, V. (2003). The urbanization process and economic growth: the so-what question. *Journal of Economic Growth*, *8*(1), 47-71.

Hendrix, C. S., & Glaser, S. M. (2007). Trends and triggers: Climate, climate change and civil conflict in Sub-Saharan Africa. *Political geography*, *26*(6), 695-715.

Henry, S., Boyle, P., & Lambin, E. F. (2003). Modelling inter-provincial migration in Burkina Faso, West Africa: the role of socio-demographic and environmental factors. *Applied Geography*, *23*(2), 115-136.

Holler, J. (2014). Is Sustainable Adaptation Possible? Determinants of Adaptation on Mount Kilimanjaro. *The Professional Geographer*, *66*(4), 526-537.

Homer-Dixon, T. F. (1994). Environmental scarcities and violent conflict: evidence from cases. *International security*, *19*(1), 5-40.

Huntingford, C., Lambert, F. H., Gash, J. H., Taylor, C. M., & Challinor, A. J. (2005). Aspects of climate change prediction relevant to crop productivity. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*(1463), 1999-2009.

Hyder, A. A., Maman, S., Nyoni, J. E., Khasiani, S. A., Teoh, N., Premji, Z., & Sohani, S. (2007). The pervasive triad of food security, gender inequity and women's health: exploratory research from sub-Saharan Africa. *African Health Sciences*, *5*(4), 328-334.

Intergovernmental Panel on Climate Change (IPCC). (2007). Fourth Assessment Report: Climate Change 2007, Synthesis Report. Retrieved from http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html

International Food Policy Research Institute. (2002). Dar es Salaam urban livelihood challenges.

Jacobi, P., Amend, J., & Kiango, S. (2000). Urban agriculture in Dar es Salaam: providing an indispensable part of the diet. *Growing cities, growing food: Urban agriculture on the policy agenda*, 257-283.

Johnston, B. F., & Mellor, J. W. (1961). The role of agriculture in economic development. *The American Economic Review*, 566-593.

Kasarda, J. D., & Crenshaw, E. M. (1991). Third world urbanization: dimensions, theories, and determinants. *Annual Review of Sociology*, 467-501.

Katapa, R. S. (2006). A comparison of female-and male-headed households in Tanzania and poverty implications. *Journal of Biosocial Science*, *38*(3), 327.

Kates, R. W., & Dasgupta, P. (2007). African poverty: A grand challenge for sustainability science. *Proceedings of the National Academy of Science, 104*(43), 16747-16750.

Keiser, J., Utzinger, J. Ü. R. G., De Castro, M. C., Smith, T. A., Tanner, M., & Singer, B. H. (2004). Urbanization in sub-Saharan Africa and implication for malaria control. *American Journal of Tropical Medicine and Hygiene*, *71*(2; SUPP), 118-127.

Khasiani, S. A., & Okoth-Okombo, D. (1995). Migration, Women's Status and Poverty in Kenya.

Laczko, F., & Aghazarm, C. (Eds.). (2009). *Migration, environment and climate change: Assessing the evidence*. Geneva, Switzerland: International Organization for Migration.

Lampard, E. E. (1961). American historians and the study of urbanization. *The American Historical Review*, *67*(1), 49-61.

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The manchester school*, *22*(2), 139-191.

Leyna, G. H., Mnyika, K. S., Mmbaga, E. J., Hussain, A., Klouman, E., Holm-Hansen, C., & Klepp, K. I. (2008). Food insufficiency in rural Kilimanjaro, Tanzania. *East African medical journal*, *84*(4), 163-171.

Lipton, M. (1980). Migration from rural areas of poor countries: the impact on rural productivity and income distribution. *World Development*, *8*(1), 1-24.

Lynch, K. (1994). Urban fruit and vegetable supply in Dar es Salaam.*Geographical Journal*, 307-318.

Martin, S. (2010). Climate change, migration, and governance. *Global Governance: A Review of Multilateralism and International Organizations*, *16*(3), 397-414.

Martine, G., & Schensul, D. (2013). *The demography of adaptation to climate change*. United Nations Fund for Population Activities.

Mberu, B. U. (2005). Who moves and who stays? Rural out-migration in Nigeria. *Journal of Population Research, 22*(2), 141-161.

McGranahan, g., & Satterthwaite, D. (20033). Urban centers: an assessment of sustainability. *Annual Review of Environment and Resources, 28*(1), 243-274.

Moore, N., Alagarswamy, G., Pijanowski, B., Thornton, P., Lofgren, B., Olson, J., ... & Qi, J. (2012). East African food security as influenced by future climate change and land use change at local to regional scales. *Climatic change*,*110*(3-4), 82

Msigwa, R. E., & Mbongo, J. E. (2013). Determinants of Internal Migration in Tanzania. *Journal of Economics and Sustainable Development*, *4*(9), 28-35.

Muthoni, J. W., & Wangui, E. E. (2013). Women and climate change: strategies for adaptive capacity in Mwanga District, Tanzania. *African Geographical Review*, *32*(1), 59-71.

National Bureau of Statistics, United Republic of Tanzania. (2002). 2002 Tanzanian Census.

National Bureau of Statistics, United Republic of Tanzania. (2013). Tanzania in figures 2012.

National Bureau of Statistics, United Republic of Tanzania. (2013). Population distribution by age and sex.

National Bureau of Statistics, United Republic of Tanzania. (2015). Migration and urbanization report.

Naudé, W. (2004). The determinants of migration from sub-Saharan African Countries. *Journal of African Economies, 19*(3), 330-356. doi: 10.1093/jae/ejq004.

Njuki, J., Waithanji, E., Sakwa, B., Kariuki, J., Mukewa, E., & Ngige, J. (2013). Do women control what they grow? The gendered use of KickStart's pumps for irrigation in Kenya and Tanzania. http://www.ifpri.org/sites/default/files/publications/gaapnote08.pdf . Retrieved February 11, 2014.

New, M., Hewitson, B., Stephenson, D. B., Tsiga, A., Kruger, A., Manhique, A., … & Lajoie, R. (2006). Evidence of trends in daily climate extremes over southern and west Africa. *Journal of Geophysical Research: Atmospheres (1984–2012)*, *111*(D14).

Ocello, C., Petrucci, A., Testa, M. R., & Vignoli, D. (2014). Environmental aspects of internal migration in Tanzania. *Population and Environment*, 1-10.

Olson, J. M. (1990). *Impact of changing socioeconomic factors on migration patterns in Rwanda*.

Oucho, J. O. (1998). Recent internal migration processes in Sub-Saharan Africa: determinants consequences and data adequacy issues.

Paavola, J. (2008). Livelihoods, vulnerability and adaptation to climate change in Morogoro, Tanzania. *Environmental Science & Policy*, *11*(7), 642-654.

Parks, B. C., & Roberts, J. T. (2006). Globalization, vulnerability to climate change, and perceived injustice. *Society and Natural Resources*, *19*(4), 337-355.

Rao, N. (2005). Gender Equality, Land Rights and Household Food Security: Discussion of Rice Farming Systems. *Economic and Political Weekly*, 2513-2521.

Reinharz, S., & Davidman, L. (1992). *Feminist methods in social research*. Oxford University Press.

Renaud, F., Bogardi, J. J., Dun, O., & Warner, K. (2007). Control, adapt or flee. *How to face environmental migration*, *5*.

Renaud, F. G., Dun, O., Warner, K., & Bogardi, J. (2011). A decision framework for environmentally induced migration. *International Migration*, *49*(s1), e5-e29.

Reuveny, R. (2007). Climate change-induced migration and violent conflict. *Political Geography*, *26*(6), 656-673.

Sarris, A., Savastano, S., & Christiaensen, L. (2006). The role of agriculture in reducing poverty in Tanzania: A household perspective from rural Kilimanjaro and Ruvuma. *FAO Commodity and Trade Policy Research Working Paper*, (19).

Smit, J., & Nasr, J. (1992). Urban agriculture for sustainable cities: using wastes and idle land and water bodies as resources. *Environment and Urbanization, 4*(2), 141-152.

Smith, C. D., & Stevens, L. (1988). Farming and income-generation in the female-headed smallholder household: the case of a Haya village in Tanzania. *Canadian Journal of African Studies*, 552-566.

Smucker, T. A., Wisner, B., Mascarenhas, A., Munishi, P., Wangui, E. E., Sinha, G., ... & Lovell, E. (2015). Differentiated livelihoods, local institutions, and the adaptation imperative: assessing climate change adaptation policy in Tanzania. *Geoforum*, *59*, 39-50.

Tacoli, C. (2009). Crisis or adaptation? Migration and climate change in a context of high mobility. *Environment and Urbanization*, *21*(2), 513-525.

Tacoli, C., & Mabala, R. (2010). Exploring mobility and migration in the context of rural—urban linkages: why gender and generation matter. *Environment and Urbanization*, *22*(2), 389-395.

Thomas, D. S., & Twyman, C. (2005). Equity and justice in climate change adaptation amongst natural-resource-dependent societies. *Global Environmental Change*, *15*(2), 115-124.

Thornton, P. K., Jones, P. G., Alagarswamy, G., & Andresen, J. (2009). Spatial variation of crop yield response to climate change in East Africa. *Global Environmental Change*, *19*(1), 54-65.

Tumbo, S. D., Kahimba, F. C., Mbilinyi, B. P., Rwehumbiza, F. B., Mahoo, H. F., Mbungu, W. B., & Enfors, E. (2012). Impact of projected climate change on agricultural production in semi-arid areas of Tanzania: a case of same district.*African Crop Science Journal*, *20*(2), 453-463.

Turner, B. L., & Robbins, P. (2008). Land-change science and political ecology: Similarities, differences, and implications for sustainability science. *Annual review of environment and resources, 33*(100)*,* 295-316.

UN Human Development Program. (UNDP) (2014). Human Development Reports. http://hdr.undp.org/en/countries Retrieved September 27, 2014

UNICEF (2012). Cities and children: the challenge of urbanization in Tanzania. Retrieved from http://www.unicef.org/infobycountry/files/Cities_and_Children_-_FINAL.pdf

UNICEF (2013). Tanzania Statistics. http://www.unicef.org/infobycountry/tanzania_statistics.html Retrieved September 21, 2014.

United Republic of Tanzania, Ministry of State Planning. (1997). Tanga region socio-economic profile.

United Republic of Tanzania, Division of Environment. (2007). National adaptation programme of action (NAPA).

United Republic of Tanzania, Division of Environment. (2012). National climate change communication strategy.

United Republic of Tanzania, Division of Environment. (2012). National report for the United Nations conference on sustainable development, Rio+20.

United Republic of Tanzania. (2013). Population Distribution by Administrative Units.

Verdin, J., Funk, C., Senay, G., & Choularton, R. (2005). Climate science and famine early warning. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*(1463), 2155-2168.

Warner, K., Ehrhart, C., de Sherbinin, A., Adamo, S., & Chai-Onn, T. (2009). In search of shelter. *Mapping the Effects of Climate Change on Human Migration and Displacement. Chatelaine, CARE International.*

Watkiss, P. Downing, T., Dyszynski, J., Pye, S. et al. (2011). The economics of climate change in the United Republic of Tanzania. Report to Development Partners Group and the UK Department for International Development. Available at: http://economics-of-cc-in-tanzania.org/

Webb, P. (2010). Medium to long-run implications of high food prices for global nutrition. *The Journal of nutrition, 140*(1), 143S-147S.

Wittig, R., König, K., Schmidt, M., & Szarzynski, J. (2007). A study of climate change and anthropogenic impacts in West Africa. *Environmental Science and Pollution Research-International*, *14*(3), 182-189.

World Bank (2013). Tanzania Data. http://data.worldbank.org/country/tanzania Retrieved September 21, 2014.

World Food Program (WFP). (2013) Comprehensive food security and vulnerability analysis, Tanzania, 2012. http://documents.wfp.org/stellent/groups/public/documents/ena/wfp259829.pdf . Retrieved February 11, 2014.

Zuberi, T., Sibanda, A., Bawah, A., & Noumbissi, A. (2003). Population and African society. *Annual review of sociology*, 465-486.