SUSTAINABLE DEVELOPMENT AND THE ISSUE OF WATER IN THE KAGERA REGION OF TANZANIA

by

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DEDICATION

My inspiration for beginning my journey towards advanced education was my late husband Danny Salinas. In heaven, he is proud of my achievement. I dedicate this research study to my son Jason Dresner, mother Teresita Martin, and sister Lilia Martin. I thank you for your love and for motivating my sense of adventure.

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SUSTAINABLE DEVELOPMENT AND THE ISSUE OF WATER IN THE KAGERA REGION OF TANZANIA

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University of the Incarnate Word, 2013

Over the last five decades, an abundance of research on sustainable development has emerged in multiple disciplinary areas, but few studies on the economic, social, and environmental dimensions of sustainability have examined water issues for rural communities. Consequently, the purpose of this case study was to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water. The following central questions of the study sought to explore the local meanings of sustainable development and improved water sources: (a) How was life of rural women from the Kagera region in Tanzania before the rainwater harvester project, and how did it change as a result of it?; (b) How did the rural women from the Kagera region in Tanzania perceive and experience the economic, social, and environmental impact as a result of easier access to water?; and (c) As a consequence of the rainwater harvester project, what did they seek to sustain, and what did they seek to develop?

Using a qualitative case study approach, I traveled to Bukoba, Tanzania, to interview members of the Bukoba Women's Empowerment Association (BUWEA) who were associated with the water project. The findings of the study revealed the hardships of living without easy access to water. The rural women of the Kagera region spent countless hours trekking through harsh terrain in search of water, at times fearing for their safety, while enduring fatigue, illness,

punishment, and having to deal with contaminated water. With support from nonprofit organizations, the rural women built rainwater harvesters in four villages. Economic, social, and environmental improvements were reported as a product of easier access to water. Moreover, their reflections provided their own framework and understanding of sustainable development based on four themes: membership, partnerships, group projects, and empowerment.

The BUWEA women understand sustainable development as an action constructed under their own framework with outside support. The concept of sustainable development calls for strong membership, supportive partnerships, meaningful group projects, and ultimate feelings of empowerment, all leading to the expansion of their capabilities and enhancement of freedom. Institutions, policymakers, and NGOs should support local initiatives in a collaborative manner with mutual agreement on results as a strategy to secure commitment and sustainability from all.

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LIST OF ABBREVIATIONS

BUWEA	Bukoba Women's Empowerment Association
GNI	Gross National Income
GDP	Gross domestic product
GII	Gender Inequality Index
GWWI	Global Women's Water Initiative
HDI	Human Development Index
ISSB	Interlocking Stabilized Soil Brick
JMP	Joint Monitoring Programme
MDGs	Millennium Development Goals
NGOs	Nongovernmental Organizations
PPP	Purchasing Power Parity
SDGs	Sustainable Development Goals
UN	United Nations
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
UNCSD or Rio+20	United Nations Conference on Sustainable Development
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNIFEM	United Nations Development Fund for Women
WASH	Water, Sanitation, and Hygiene
WGC	Women's Global Connection
WHO	World Health Organization

Chapter 1: Sustainable Development and the Issue of Water in the Kagera Region of Tanzania

Context of the Study

Sustainable development is a concept that unites developmental and environmental needs in the present without harming the future. Water is one of the pressing issues in sustainability, but access to safe drinking water remains scarce in many households. Despite tremendous advances in human development, over 768 million people on the planet lack access to safe drinking water, and 2.5 billion lack access to sanitation facilities (United Nations Children's Fund [UNICEF], 2013b). Efforts to secure this essential element for basic survival needs require tremendous energy from the poor. If people, mostly women, are not able to get easy access to water, they remain impoverished as a result of the all-consuming time and effort of obtaining it, which often occupies the majority of the day. Women's empowerment intertwines with development and environmental problems, as stated by Secretary General Ban Ki-moon: "We must connect the dots between climate change, water scarcity, energy shortages, global health, food security and women's empowerment" (United Nations General Assembly, 2011).

Concerns of a world confronted with inequities, marginalization, and continuing deterioration of the ecosystems have fueled a global movement to eradicate poverty by integrating development and environment initiatives. The United Nations member states sought to free humanity from extreme poverty and ecological deterioration in the form of targeted interventions expressed as the Millennium Development Goals (MDGs), which are set to conclude in the year 2015. The MDGs offered a set of interventional strategies to combat a history of exclusion caused by poverty and lack of access to health care, education, gender parity, and adequate infrastructure.

Notwithstanding targeted interventions, opportunities remain elusive, particularly for women living in rural areas (Chen& Ravallion, 2007; United Nations [UN], 2011). Rural people constitute "about three-quarters of the developing world's poor" (Ravallion, Chen, & Sangraula, 2007, p. 693). Socioeconomic status and cultural traditions have placed rural women and girls at a disadvantage. They are normally the caregivers and caretakers, roles that impact their ability to attend school, obtain paying jobs, and keep healthy. Normally rural women are responsible for growing food crops and caring for animals, time-consuming tasks that are performed using rudimentary tools and with limited access to water and technology. In 2012, the United Nations Conference on Sustainable Development (UNCSD or Rio+20) made a commitment to find solutions beyond the MDGs not yet achieved. As a result, the post 2015 development agenda became the outcome from the conference with a mandate to respond to people's needs and to identify a set of Sustainable Development Goals (SDGs) after the year 2015.

> We recognize that people are at the centre of sustainable development and, in this regard, we strive for a world that is just, equitable and inclusive, and we commit to work together to promote sustained and inclusive economic growth, social development and environmental protection and thereby to benefit all. (UN, 2012b, p. 2)

Discussions on the successes and shortfalls of the MDGs led to the realization of the missed opportunity to engage local voices in policy-making. Consequently, the Rio+20 sought an agreement from UN member states to recognize the importance of including the voices of all stakeholders while following an inclusive intergovernmental process to define the new SDGs for the General Assembly (UN, 2012b). The notion of sustainable development assumes that people possess the ability to impact and guide social and environmental factors (Charlton, 1984).

Water sustainability is at the heart of each endeavor within economic, social, and environmental realms. In regard to the post 2015 development agenda, the UN System Task Team (2012) stated the following:

> Member States have also identified a number of priority areas for sustainable development. Among these are poverty eradication; food security and sustainable agriculture; water and sanitation; energy; sustainable tourism; sustainable transport; sustainable cities and human settlements; health and population; full and productive employment, decent work and social protection; oceans and seas; disaster risk reduction and resilience; sustainable production and consumption; gender equality and women's empowerment, among others. (p. 41)

The UN has acknowledged that women who contribute and participate in creating sustainable solutions are empowered. Sha Zukang, Under-Secretary-General for Economic and Social Affairs in the UN recognized the role of women and the importance of gender equality by affirming that women's empowerment and the achievement of the MDGs were interrelated (UN, 2011).

Cheston and Kuhn (2002) defined empowerment as "gaining the ability to generate choices and exercise bargaining power" (p. 12). The need for empowerment arises from the people's desire to actualize their dreams or reach their greatest potential regardless of barriers created within society. The United Nations Development Fund for Women (UNIFEM, 2000) identified important elements of women's empowerment as "developing a sense of self-worth, a belief in one's ability to secure desired changes, and the right to control one's life" (p. 7). Datta and Kornberg (2002) stated that empowerment in the present century must have a better comprehension of the issues of women at all levels, including political, social, and economic issues. In many areas of the world, women have been excluded from active participation at these levels as a result of cultural customs. Generally, local customs mandate that women focus at their personal expenses on their families. This lost opportunity for women to expand beyond their own families into their communities, within their own countries, has hindered women from effective change.

Lifting people out of poverty and marginalization, particularly rural women, demands a holistic approach rooted in sustainability with capacity building and local ownership as empowering prerequisites (Ettling, Buck, & Caffer, 2010). According to UN Women (n.d.), women represent 70% of the world's poorest people. In 2009, of the 793 million illiterate adults in the world two thirds were women (UN, 2011). Illiteracy contributes to the cycles of poverty, disease, and deprivation. Concerns about women who have less access to education and are overworked (Datta & Kornberg, 2002) remain true for more than a decade since the time-bound MDG to achieve gender equality that was published by the UN.

Sustainable development approaches toward poverty eradication efforts remain focused on developing countries, including Tanzania in sub-Saharan Africa. Despite steady economic growth, Tanzania remains one of the poorest countries in the world. Women of Tanzania, like millions of other African women, are responsible for over 80% of the labor force in the production of food and exported crops, but they continue to encounter numerous obstacles (Boakari, 2004). Women who reside in rural areas in developing countries, such as Tanzania, are disadvantaged by gender roles. Opportunities to obtain education that lead to remunerated employment are not accessible to many women and girls because they need to help with child-rearing responsibilities and household chores, such as fetching water. Nussbaum (1995) asserted that "customs, in short, are important causes of women's misery and death" (p. 3).

Lack of easy access to water precludes women from starting and growing their business, keeping themselves healthy, and attending school. With nearly one billion people living without access to safe drinking water, it is an unfortunate fact that women and girls are mostly responsible for obtaining it. Poverty eradication and environmental health cannot be achieved

without basic elements such as water. On World Water Day 2013, Margareta Wahlström, the UN Secretary-General's special representative for Disaster Risk Reduction, stated:

> Today, if you are fortunate enough to leave your tap running as you shave, brush your teeth or even wash the dishes perhaps take a moment to reflect on what life is like for the one billion people on this planet who cannot take water for granted: our fellow humans who have no access to water at all or no access to clean drinking water. Then consider those who spend an estimated 200 million hours each day globally collecting water—usually women and girls—leaving them no time to develop or actualize their precious human potential.
>
> As we focus on the issue of water today on World Water Day, it is perhaps opportune to remind ourselves that there can be no sustainable development without sustainable water. Water is one of the two essences of life. (United Nations Office for Disaster Risk Reduction [UNISDR]. 2013, para. 1–2)

Outside interventions to break poverty and marginalization cycles will have greater success when local people participate in long-term solutions. The importance of local ownership and local contexts are recognized to be catalysts for poverty eradication and preservation of the environment (Crate, 2006; Stiglitz, 2002). Smith (2005) proposed that "first and foremost we must listen to the poor on their own terms" (p. 18).

Currently, in Bukoba Tanzania, a nonprofit organization named the Bukoba Women's Empowerment Association (BUWEA) has embraced empowering activities, capacity building, and local ownership initiatives using participatory approaches for its mostly rural women members. The organization aims to alleviate poverty and marginalization of disadvantaged women in the Kagera region (Caffer, 2006; Nkuba, 2007; Sseruwagi, 2012). Aligned with the MDGs and the post 2015 development agenda, the women of BUWEA seek to eradicate poverty, access education, reach gender parity, and preserve the environment. A holistic approach towards poverty alleviation by BUWEA includes raising economic status through microenterprises, reaching social agency through social support, and providing access to environmental resources.

In 2003, the BUWEA women partnered with Women's Global Connection (WGC), another nonprofit organization based in the United States. Since 2008, both have investigated improved sources of water for less advantaged members living in remote villages in Bukoba, Tanzania, and other parts of the Kagera region. Evaluating better water source alternatives has led to training opportunities on how to build rainwater harvesters. On two separate occasions in 2011–2012, two BUWEA leaders—with funding from WGC donors—traveled to Kampala, Uganda, for two-week workshops to learn about water issues and rain harvester construction from a nonprofit organization named Global Women's Water Initiative (GWWI). As of June 2013 the BUWEA women have built eight rainwater harvesters to provide water benefits to more than 450 people living in four different villages: Kishanje, Kabale, Bilongo, and Nsisha. Today, BUWEA leaders strive to build rainwater harvesters in every rural area where members reside to allow more of their time to engage in income-generating activities and to secure other social and environmental benefits associated with improved access to water.

Research Site

The research site is the Kagera region in the United Republic of Tanzania, a sub-Saharan country of Africa (see Figure 1). Africa is a continent physically and culturally divided into two different and distinct regions. The northern region, which is close to the European Mediterranean and the Middle East, became known as the Arab Africa. Sub-Saharan Africa, which sits south of the Sahara desert, became known as Black Africa, referencing its majority black population. It is composed of 52 nations (Gannon, 2004).

Figure 1. Map of Africa. From The World Factbook. Tanzania, by Central Intelligence Agency, (2013).

African countries followed different pathways to gain their independence, some through armed conflicts and others through peaceful withdrawals. Africa's independence fueled debate as some argued that the colonial period brought new ideas, education, and customs from nonnationals (Calderisi, 2006), while others asserted that most nations were left without basic structure and infrastructure. Richmond & Gestrin (1998) stated that Europeans arbitrarily set country boundaries "without regard for the ethnic, cultural, religious, and linguistic homogeneity that existed in Africa before their arrival" (p. 17). Furthermore, post independent African states developed or inherited substantial foreign debts, cultural conflicts, inexperienced political institutions, and social challenges (Boakari, 2004).

In 1964, the United Republic of Tanzania was born out of a union of Tanganyika, after gaining independence from Great Britain, with the Muslim island state of Zanzibar. Referred to as Tanzania, it is a developing country in sub-Saharan Africa with a population of approximately 45 million (National Bureau of Statistics [NBS] & Office of Chief Government Statistician [OCGS], 2013) and with a territory of 947,300 km^2 (CIA, n.d.). Tanzania is bordered by the Indian Ocean and eight countries: Burundi, Democratic Republic of the Congo, Kenya, Malawi, Mozambique, Rwanda, Uganda, and Zambia (see Figure 2). The official language is Kiswahili, the mother tongue of the Bantu people.

Classified as a least developed country, Tanzania was positioned at 153 out of 187 countries in the Human Development Index (HDI) for 2011 (UN-Water, 2013). The HDI is a summary of three dimensions of human development, which measures progress on life expectancy at birth, education, and living standards. The 2012 HDI data for Tanzania indicates life expectancy at birth to be 58.9, expected years of schooling at 9.1, and purchasing power parity (PPP) in gross national income (GNI) per capita at 1,383 U.S. dollars (United Nations Development Programme [UNDP], 2013).

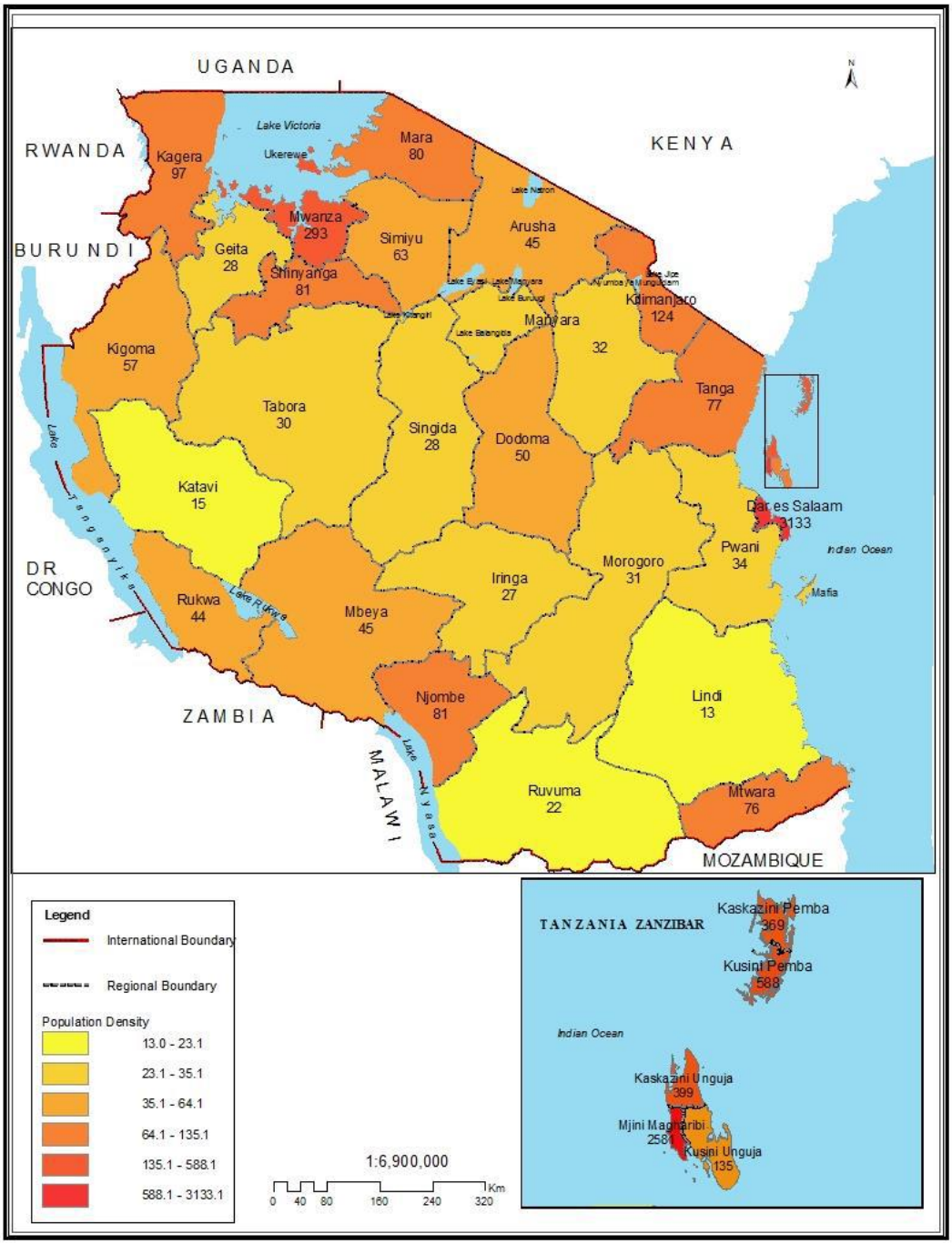

Figure 2. Map of Tanzania. From *2012 Population and Housing Census. Population Distribution by Administrative Units: Key Findings* (p. 7), by National Bureau of Statistics and Office of Chief Government Statistician, (2013).

Table 1 shows an overview of Tanzania and its economic, social, and environmental indicators.

Table 1

Tanzania Indicators

Category	Indicator
Capital city	Dar Es Salaam
Population	48,261,942 (July 2013 est.)
Age structure	0–14 years: 44.8% 15–24 years: 19.4% 25–54 years: 29.3% 55–64 years: 3.5% 65 years and over: 2.9% (2013 est.)
Median age	Total: 17.3 years (2013 est.)
Population growth rate	2.82% (2013 est.)
Birth rate	37.25 births/1,000 population (2013 est.)
Language	Kiswahili or Swahili (official), English, Arabic
Religion	Christian 30%, Muslim 35%, Indigenous beliefs 35%
Economic Stats: GDP	$75.07 billion (2012 est.)
GDP: composition, by sector of origin	Agriculture: 27.7% Industry: 25.1% Services: 47.2% (2012 est.)
Population below the poverty line	36% (2002 est.)
Infrastructure stats: Drinking water source	Improved Urban: 79% of population Rural: 44% of population Total: 53% of population Unimproved Urban: 21% of population Rural: 56% of population Total: 47% of population (2010 est.)
Infrastructure stats: Sanitation facility access	Improved Urban: 20% of population Rural: 7% of population Total: 10% of population Unimproved Urban: 80% of population Rural: 93% of population Total: 90% of population (2010 est.)
Education Stats: Literacy, defined as children age 15 and over can read and write Kiswahili (Swahili), English, or Arabic	Total population: 67.8% (2010 est.)
Education expenditure	6.2% of GDP (2009)

Note. GDP = gross domestic product. Information obtained from CIA (n.d.).

In the 1970s, Tanzania was considered an African socialist state under the leadership of its President Julius Nyerere. In the Arusha Declaration of 1967, which he wrote, he encouraged people to be self-reliant and not to depend on foreign aid. Furthermore, Nyerere said that "there are so many needy countries in the world. And even if all the prosperous nations were willing to help the needy countries, the assistance would still not suffice" (Calderisi, 2006, p. 105). Nyerere promoted self-reliant investment in education, healthcare, and water and sanitation services but in reality foreign aid was needed and prevalent. In 2013, development and environmental focus initiatives, such as the Tanzania Development Vision of 2025, were grounded in the Arusha Declaration.

The vision articulated by the President of the United Republic of Tanzania, Benjamin William Mkapa in 2012, emphasized the nation's commitment to enter a competitive global economy by overcoming poverty and disease (United Republic of Tanzania Planning Commission, 1999). Like the Arusha Declaration, it encourages the population to become more self-reliant and to decrease their dependence on donor organizations. Attainment of the Tanzania Development Vision 2025 includes an ambitious plan to eradicate poverty by the year 2025. It is an inspiring plan for a country that has suffered from the devastation of the HIV/AIDS virus.

The HIV/AID illness is a shared misfortune with African countries, which accounted for 70% of new HIV infections in 2010 (UN, 2012a). Tanzania's 5.6% prevalence rate places 12th out of 166 countries in a study of adults living with HIV/AIDS (Central Intelligence Agency). The Kagera region experienced one of the early cases of HIV/AIDS in the Ndolage Hospital in 1983, making it the first region in Tanzania to be affected by the epidemic (Lugalla et al., 2004).

From 1978 to 1979, Tanzania fought its first and only war with neighboring Uganda to defend a portion of the Kagera region. The Kagera region is located south of the equator in the

northwest part of Tanzania bordering the countries of Uganda, Rwanda, Burundi, and the waters of Lake Victoria (Bukoba-Kagera-Tanzania—The Official Webguide, n.d.). The Kagera region has 28,953 square kilometers of land and 11,885 square kilometers of water from lakes and rivers. Its population was estimated at 2.5 million in 2012 (NBS & OCGS, 2013).

Economic activities include fishing, livestock breeding, mining, tourism, farming, and agriculture of coffee, bananas, and other produce. Rural farmers engage in subsistence farming with low levels of investment in their production of food crops. Conversely, regular rainfalls, its proximity to Lake Victoria, and the equator seem conducive to building a stronger agricultural sector.

Agriculture and trade offer the main economic routes out of poverty in the Kagera region, as De Weerdt (2010) pointed out in his study about rural people in the area. Administratively, the Kagera region is composed of eight councils, including the Bukoba Municipal Council where the study took place. Table 2 shows the districts/regions and population of the Kagera region as of the 2012 Population Census Data (NBS & OCGS, 2013).

Setting of the Study

The Kagera region is situated in the northwestern part of Tanzania. The research study took place in Bukoba, the capital of the Kagera region. The population of Bukoba is approximately one hundred and eighty-four thousand. The research study included four additional villages in the Kagera region where the rainwater harvesters were built: Kishanje, Kabale, Bilongo, and Nsisha. Refer to Figure 3.

Table 2

Districts of Kagera Region

	District/Council	Population
1	Karagwe District	332,020
2	Bukoba District	289,697
3	Muleba District	540,310
4	Biharamulo District	323,486
5	Ngara District	320,056
6	Bukoba Municipal	128,796
7	Missenyi District	202,632
8	Kyerwa District	321,026

Note. Adapted from *2012 Population and Housing Census. Population Distribution by Administrative Areas.* Table 18.0: Population of Kagera Region by Sex, Average Household Size and Sex Ratio (p. 183), by National Bureau of Statistics and Office of Chief Government Statistician, (2013).

This study included the voices of the women of the Bukoba Women's Empowerment Association (BUWEA) regarding sustainable development, and it explored how the women perceived and experienced sustainable development as a result of their improved access to water. In 1996, the organization began as a small prayer group of ten women, under the name of St. Cecilia, to motivate and to support each other amidst poverty and HIV/AIDS suffering. Initially, the group would contribute less than two U.S. dollars per month for a small microloan fund called the Mary-Go-Round, in honor of the Virgin Mary. One member would then borrow the entire sum of money to start or improve an economic project. Once a month, their collective contribution would rotate to help each member start an income-generating project, such as poultry, piggery, small scale farming, and handicrafts (Buck & Holbrook, 2013).

Figure 3. Adapted from Map of Kagera region. From "Location Kagera Region," by Bukoba-Kagera-Tanzania—The Official Webguide, (n.d.).

A decade later, the group officially registered under Tanzanian law as a nonprofit organization seeking to empower its members by promoting education and economic development. The long-term goal of BUWEA is to raise the economic status of women in the area of Bukoba District of Kagera Region, Tanzania (Sseruwagi, 2013). BUWEA hopes to eradicate poverty for rural Tanzanian women who have been marginalized as a result of lack of education, job opportunities, health and wellness, and infrastructure support systems.

As of June 2013, there were 394 BUWEA members belonging to 68 groups in villages in the Kagera region. The BUWEA organization has experienced steady growth in group

membership and has expanded beyond the initial activity of microlending. Specifically, the organization has developed capacity-building initiatives and has built a learning center. In addition, BUWEA has initiated other important group projects, such as soy cultivation and manufacturing, milling station operations, and rainwater harvesters. Similar to other women's groups en route to overcoming their marginalization, BUWEA's initiatives have placed them on a promising pathway.

Statement of the Problem

Over the last five decades, an abundance of research on sustainable development has emerged in multiple disciplinary areas. But at the time of this study, few studies of the economic, social, and environmental dimensions of sustainability examined water issues for rural communities. Many governments, institutions, and donors—encouraged by the MDGs and the post 2015 development agenda to provide support to impoverished people—describe efforts to lift aid recipients out of poverty through sustainable development programs (Sachs, 2005; Smith & Thurman, 2007). Despite such endeavors, many admit that they have little connection with aid recipients and a lack of understanding of the way that sustainable development can be achieved in different cultural contexts (Crate, 2006).

When well-meaning policymakers recommend long-term solutions using a top-down approach without considering local realities, this type of strategy impedes the tactics associated with sustainable development and poverty eradication. Top-down approaches to poverty reduction do not work long-term because cultural ways of knowing, living, and performing are absent from consideration (Riutta, 2007). Policymakers strive to solve complex economic, social, and environmental problems without input from the targeted population. Decisions on their behalf further marginalize women and girls who have been traditionally disadvantaged by their

local cultures' assigned gender roles that prevent them from full participation in problem solving (Chambers & Conway, 1992; Escobar, 1995; Jull, 2003). Awori (2008) asserted that "rural women leadership values their capacity to manage their own lives, not having to wait for others in order to carry out their plans" (p. 4). Notwithstanding gender, nationality, or ethnicity, poor people are aware of their reality and have created their ways of knowing.

Yunus and Jolis (1999), in response to implementing capacity training initiatives before granting credit to poor people, asserted that poor people have innate skills just by surviving. Thus, it is important to trust poor people's opinions in the decision-making process to create their own solutions. When local voices are missing from conversations on ways to promote sustainable development to transform their lives, the experience of the stakeholders is lost because people living in poverty are most interested in changing their present situation. Nkuba (2007) wrote, "from the women's comments, it is true that these women no longer embraced self-depreciation—a characteristic that convinces them of their own unfitness to perpetuate dependence" (p. 227).

Another problem is the scarcity of academic literature on how rural women perceive or experience sustainable development. A conceptual theoretical framework to understand the multidisciplinary and complex concept of sustainable development is vague at best, and it remains a perplexing topic. Jabareen (2008) cited that "a critical review of the multidisciplinary literature on sustainable development reveals a lack of a comprehensive theoretical framework for understanding sustainable development and its complexities" (p. 1). In addition, Ciegis, Ramanauskiene, and Startiene (2009) argued for the need of indicators and quantitative frameworks to advance in the field.

Purpose of the Study

The purpose of this case study was to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water.

Research Questions

The following central questions of the study sought to explore the local meanings of sustainable development and improved water sources.

1. How was life of rural women from the Kagera region in Tanzania before the rainwater harvester project, and how did it change as a result of it?
2. How did the rural women from the Kagera region in Tanzania perceive and experience the economic, social, and environmental impact as a result of easier access to water?
3. As a consequence of the rainwater harvester project, what did they seek to sustain, and what did they seek to develop?

Theoretical Framework

A theoretical framework allows the researcher to place the research study in a larger context by linking the research type and goals of the study with the results (Radhakrishna, Yoder, & Ewing, 2007). If a theoretical framework is absent, a second strategy may rely on a descriptive framework or approach. This study used the capability approach, an economic theory pioneered by Amartya Sen (1973; see Figure 4). Sen is a leading economist and philosopher from India who was awarded the Nobel Prize in Economic Sciences in 1998. Despite being trained in the field of economics, much of Sen's work has focused on inequality and poverty influenced by agency, quality of life, and empowerment (Mitra, 2003; Tungodden, 2001). Sen's approach provided a framework to study the expansion of the "capabilities of persons to lead the

kind of lives they value—and have reason to value" (Sen, 1999, p. 18). It aligned with the purpose of this study to unearth local perspectives, lack of resources, and experiences of BUWEA women as they relate to sustainable development and water.

The capability approach is a normative theory, rather than an explanatory one, that does not seek to explain but to aid in conceptualizing the notions of functionings and capabilities (Yohannes, 2008). A dual assessment of quality of life was presented by Sen within two core concepts: "*functionings* and *capability.* Functionings relate to *being and doing* such as nourishment, health, and shelter, while capability refers to *access to*" (Alkire, 2005, p. 120). Both concepts parallel the proposed study in that they considered the BUWEA women's capability to live a life that they have reason to value and to achieve utilities or subjective well-being. Figure 4 demonstrates the relationships of the concepts (Wells, 2013).

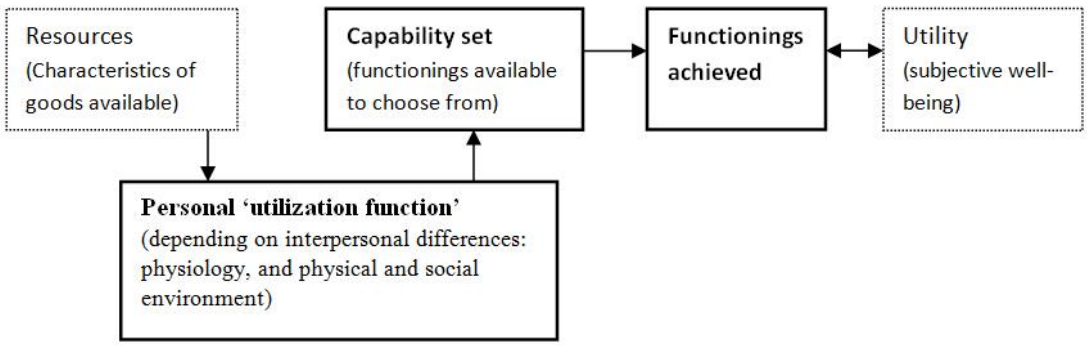

Figure 4. Outline of the core relationships in the Capability Approach

Sen provided a theoretical framework to investigate real life unjust situations and the possibilities of turning them into more just situations (as cited in Vizard, 2005). Sen (1999) proposed "five distinct types of freedom" (p. 10) to help advance the capabilities of people: (a) political freedoms, (b) economic facilities, (c) social opportunities, (d) transparency guarantees, and (e) protective security. Nussbaum (2006) expanded on Sen's work by advocating a list of ten

central capabilities in social justice. Sen (2004) response to critics was "to have such a fixed list, emanating entirely from pure theory, is to deny the possibility of fruitful public participation on what should be included and why" (p. 158).

Questions about the capability approach framework and its operational application have been raised over the years with claims that it is vague (Muffels & Headey, 2013). However, studies on the operational applications and challenges using the capabilities approach found strength in "facilitating reflective participation" (Schischka, Dalziel, & Saunders, 2008, p. 244).

Sen (1999) believed that economic and social development facilitated the process of expanding choices described as freedoms. Increased *freedoms* relied on societal and economic determinants, such as health care, education, and economic opportunities. Absence of opportunities or resources assumed an *unfreedom*, which in this study was the negative process of obtaining water that produced negative health, education, and economic effects. Access to an improved source of water provided BUWEA women freedom or utilities in their socioeconomic development.

In addition, this study was guided by Parris and Kates' (2003) taxonomy of sustainable development goals, which seek a balance between nature and people. Parris and Kates' (2003) intragenerational concerns, as expressed in the MDGs, inspire efforts to cease inequities in the present while promoting conservation of the planet for future generations. Their taxonomy served as a guide in this study's Interview Protocol when I conducted open-ended interviews regarding the impact of having easier access to water in its three dimensions: economic, social, and environmental. In addition, it enriched the subject of sustainability with reflections of *what to sustain* and *what to develop*. Table 3 shows the goals of sustainability and development.

Table 3

Taxonomy of Sustainable Development Goals (4)

What is to be sustained	What is to be developed
Nature Earth Biodiversity Ecosystems	People Child survival Life expectancy Education Equity Equal opportunity
Life support Ecosystem services Resources Environment	Economy Wealth Productive sectors Consumption
Community Cultures Groups Places	Society Institutions Social capital States Regions

Note. Adapted from "Characterizing and Measuring Sustainable Development," by T. M. Parris and R.W. Kates, 2003, *Annual Review of Environment and Resources*, *28* (1), p. 561. Reprinted with permission (see Appendix E). Copyright 2003 by Thomas M. Parris and Robert W. Kates.

Significance of the Study

The research study sought to accomplish the following four goals. First, this study aimed to contribute to the body of knowledge of sustainable development and water issues. Second, it intended to illuminate the perceptions of traditionally poor and marginalized rural women. Third, the study hoped to explain the women's experiences accessing improved water in their villages. And fourth, the study proposed to uncover the women's views on sustainable development in its economic, social, and environmental dimensions.

In addition, knowledge of what the women wanted to sustain and what they wanted to develop may potentially add to the sustainability dialogue. Specifically, policymakers, local government, nongovernmental organizations (NGOs), and other women organizations may benefit from this study given the importance of SDGs in the post 2015 development agenda and the absence of participatory approaches from indigenous stakeholders (Freire, 1998; Mertens, 2009; Scoones, 2009). Furthermore, the rural women who are creating their own pathway into sustainability may enlighten the local and global dialogue on poverty eradication strategies. Observations into the women's journey to alleviate poverty and to achieve empowerment by accessing water may provide critical local knowledge and insight into critical needs.

Limitations of the Study

This case study involved a group of rural women who have participated in the rainwater harvester project to improve access to water in the Kagera region of Tanzania. The participants were all members of BUWEA, a local nonprofit organization that supports women's empowerment projects. As a result of their experiences with improved access to water, their unique stories represented a snapshot in time, a glimpse into their lives captured by a single researcher. The results of the case study, obtained by using a qualitative paradigm, are subjective and cannot be generalized to other women's groups.

Moreover, I served as executive director of the WGC for about three and a half years prior to conducting the research study. Immersion trips to Bukoba led to a relationship between me and the women of BUWEA, which allowed kinship and a sense of familiarity. To minimize biases, I relied on the analytical processes and tools explained in Chapter 3, the high ethical standards from the Collaborative Institutional Training Initiative (CITI) coursework, and the Institutional Review Board (IRB) of the University of the Incarnate Word (UIW). In addition, I

used other research studies about BUWEA and two translating services, one in the field and the other as a virtual transcriber and translator.

Cross-cultural limitations included the language and interpretations made by the researcher. The participants' native language was Kiswahili and the dialect of Kihaya. To minimize the limitations of the study, English, Kiswahili, and Kihaya were used by engaging the services of an experienced translator. The same translator accompanied me to the BUWEA office interviews with the Kiswahili speakers and traveled to the villages to translate group interviews. According to Liamputtong (2008), the researcher and the translator should debrief after each interview to examine the information. Therefore, the translator and I met at the end of each day and on weekends to review the tape-recorded interviews. The tape-recorded Kiswahili interviews were later transcribed and translated into English by a virtual translator.

Overview of the Methodology

I used a case study approach to conduct an intensive investigation of local stakeholders' perceptions and experiences of sustainable development as a result of their improved access to water. The case study design is recognized as a qualitative research method that uses multiple sources of data to illuminate local perspectives and experiences.

Yin (2013) offered a twofold definition of case study:

1. A case study is an empirical inquiry that
    - investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when
    - the boundaries between phenomenon and context may not be clearly evident. (p. 16)
2. A case study inquiry
    - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
    - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
    - benefits from the prior development of theoretical propositions to guide data collection and analysis. (p. 17)

Schram described a case study as one that illuminates a decision or set of decisions, the rationale behind them, their implementation, and their results (as cited in Yin, 1994). This case study aimed to explore the deliberate choice of the participants to embrace capacity building by learning how to (a) build rainwater harvesters, (b) use local resources and materials to make the water tanks, (c) probe feelings derived from the project, and (d) investigate their plans to sustain the improved access to the water project.

According to Creswell (2009), a case study provides "an in-depth exploration of a bounded system based on excessive data collection" (p. 439). I utilized sources of data that included observations, in-depth interviews, fieldwork, and documents pertaining to the BUWEA organization and the water project. An inductive and systematic approach illuminated the evidence in its natural setting. Themes emerged based on the experiences and stories of this single case study involving the women of Bukoba.

Chapter 2: Review of Related Literature

This review of related literature contributes to the understanding of the complex and multidisciplinary nature of sustainable development and its connections to rural women and water. This chapter is divided into four sections. The first section explains the issues of water, particularly in Tanzania. The next three sections discuss sustainable development, with section two defining it, section three relating its history, and section four describing its three dimensions.

Sustainable development gained global popularity in the latter part of the 20th century as a pathway that unites economic and social advancements with environmental needs. Inequities suffered by the world's poor and changes in natural resources guided discussions of human development and conservation of the environment by policymakers and scholars alike. In this light, the Millennium Declaration, aiming to "improve the human condition" (Sachs, 2005, p. 211), inspired the hopes and dreams for a world free of war, poverty, inequity, disease, and depravation. Despite efforts to achieve the MDGs, many donors and institutions lacked the understanding of how sustainable development builds in different cultural contexts.

Evidence of this global movement and its popularity appeared in publications, studies, reports, and measurements on progress by the United Nations, the World Bank, and other institutions. Knowledge that the underprivileged were disadvantaged in their access and use of natural resources linked development efforts with the plight of the poor. However, discourse over what it means to transform the lives of the poor and how to transform them has fueled debates. One of the criticisms is that the dialogue on poverty eradication has not included the voices of the very people whose lives have been negatively touched by this phenomenon (Crate, 2006; Smith, 2005). Top-down approaches to address problems and the absence of local

meanings remain a constant barrier to the sustainability of the programs (Easterly, 2006; Scoones, 2009).

Issues of Water

Water is indispensable for living. Indeed, the global community recognized this necessary element as a human right in the International Decade for Action Water for Life 2005–2015 campaign. The year 2013 was declared the International Year of Water Cooperation by the UN General Assembly to encourage mutual aid among constituents. In addition, "water management can help overcome cultural, political, and social tensions, and can build trust between different groups, regions, or states" (UNDP, 2013).

The proclamations coordinated by the UN aimed to fulfill prior resolutions, acknowledgements, and reaffirmations of equitable access to safe drinking water and sanitation (UN, 2013b). A fundamental commitment was made in the UN Millennium Declaration, wherein 189 countries agreed to achieve eight goals, 21 targets, and 60 indicators by the year 2015. The MDGs represented developmental and environmental ideas related to poverty, disease, ecosystems, and human rights. The most commonly known eight goals and targets are the following:

1. Eradicate extreme poverty and hunger
   a. Halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day;
   b. Achieve full and productive employment and decent work for all, including women and young people;
   c. Halve, between 1990 and 2015, the proportion of people who suffer from hunger
2. Achieve universal primary education
   a. Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling
3. Promote gender equality and empower women
   a. Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015
4. Reduce child mortality
   a. Reduce by two thirds, between 1990 and 2015, the under-five mortality rate

5. Improve maternal health
   a. Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio;
   b. Achieve by 2015 universal access to reproductive health
6. Combat HIV/AIDS, malaria and other diseases
   a. Have halted by 2015 and begun to reverse the spread of HIV/AIDS;
   b. Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it;
   c. Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
7. Ensure environmental sustainability
   a. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources;
   b. Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss;
   c. Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation;
   d. Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers
8. Develop a global partnership for development
   a. Address the special needs of least developed countries; landlocked countries and small island developing states;
   b. Develop further an open, rule-based, predictable, non-discriminatory trading and financial system;
   c. Deal comprehensively with developing countries' debt;
   d. In cooperation with the private sector, make available the benefits of new technologies, especially information and communications. (UN, 2011, pp. 6–63)

The environmental MDG Number 7 sought to ensure environmental sustainability, including a target to halve the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015 (UNICEF &World Health Organization [WHO], 2009). The 2010 UN Environmental Programme report stated that "over half of the world's hospital beds are occupied with people suffering from illnesses linked with contaminated water and more people die as a result of polluted water than are killed by all forms of violence including wars" (as cited in Pink, 2012, p. 83). Approximately 1.5 million children under five years old die as a result of diarrhea, a water and sanitation related illness prevalent in developing countries (UNICEF & WHO, 2009).

The MDG drinking water target was met in 2010 amidst recognition that sub-Saharan Africa was at 61% coverage versus the 89% global population with improved water sources. In 2013, the Millennium Report announced that the world had achieved "halving the proportion of people without access to improved sources of water, five years ahead of schedule" (UN, 2013a, Target 7.C). Nonetheless, the same report acknowledged that reaching the target escaped many people living in sub-Saharan Africa who accounted for almost 40% of all people lacking improved drinking water. The WHO and UNICEF Joint Monitoring Programme for Water Supply and Sanitation defined basic drinking-water supply post 2015 as one that protects the source from outside contaminants, and the "use of an improved drinking-water source" is to be "≤ 30 minute water collection round trip" (WHO & UNICEF, 2013, p. 11).

In September 2000, Tanzania was one of the 189 nations to sign the UN Millennium Declaration committing to the time-bound, quantified goals and targets. In 2013, Tanzania revealed that it was failing to reach the MDG for water and sanitation by the year 2015. Endowed with a vast body of water sources that include lakes, dams and rivers, and wetlands, Tanzania has the potential to satisfy its water needs but lacks the infrastructure, management, and financial resources. Specifically, Tanzania has seven lakes: Lake Victoria, Tanganyika, Nyasa, Rukwa, Eyasi, Manyara, Chala, and Jipe. The country also has seven dams and rivers: Pangani, Wami, Ruvu, Rufiji, Mbwenkuru, Matandu, and Ruvuma. The wetlands in the country encompass 5,439,000 hectares of lakes and swamps representing 5.8% of the total land surface. The 2013 *United Republic of Tanzania: UN-Water Country Brief* showed a long-term average annual precipitation of 1,071 mm or approximately 42.2 inches of rain. Though there were no reliable data on natural disasters, it was estimated that 5.4 million people in Tanzania were

affected by floods between 1989 and 2011 (UN-Water, 2013). In addition, variances in rainfall affect water flow during long dry seasons, which extend from June to October.

Kates (1971) offered an historical insight into the complexity of water management in Tanzania when he observed a lack of consistency and coordination between agencies and policymakers ten years after the country's independence. The water supply and sanitation in Tanzania, from the colonial period to the current time, changed from centralized to decentralized governance. Decentralization may be characterized as giving responsibility for water and sanitation service provision to local government authorities. Giné-Garriga, de Palencia, and Pérez-Foguet (2013) stated that studies show local governments possess a communication advantage over central government when methods of collecting data for evidence-based decisions are proposed based on local priorities. The Ministry of Water was tasked with overseeing the management of water resources institutions at the national, regional, and village levels in Tanzania. Two organizations currently support water supply and sanitation policies in urban and rural areas. The urban water supply and sanitation authorities and the community-owned water supply organizations support policies that promote the active participation of the private sector and the beneficiaries of the service (Tanzania National Website, n.d.b).

Water, as a sector in the Tanzanian economy, contributed a small percentage of the gross domestic product (GDP) at 0.2% for some years (Tanzania National Website, n.d.c). However, as a resource, it played an important role in the socioeconomic development of the country. In 2012, approximately 79% of Tanzanians participated in the agriculture sector, which produced maize, millet, rice, wheat, cassava, banana, plantain, and coffee. Agriculture, a mainstay of the country's economy, is largely dependent on the quality and quantity of water resources. Unpredictable climate conditions and poor technology affect the sector's productivity. Labor and

land productivity remain low, perhaps because "about 70 percent of Tanzania's crop area is cultivated by hand hoe, 20 percent by ox plough, and 10 percent by tractor" (Tanzania National Website, n.d.a, para. 2). Yet, agriculture contributes more than 50% to Tanzania's national income and employs approximately 80% of the rural population (Siyao, 2012). Women provide almost half of the agricultural labor. Tanzania ranked 119 out of 148 countries in 2012 on the Gender Inequality Index (GII), a Human Development measure that evaluates gender-based inequalities in three dimensions: reproductive health, empowerment, and economic activity (UNDP, 2013).

In a study of small-scale sugar growers, rural women were mostly overworked, had no time to seek information, and were not involved in important decision-making (Siyao, 2012). Rural women in agriculture traditionally do not negotiate or reap the results of their harvest in a culture where men represent the household in economic transactions (Nelson et al., 2012). Although generalizations cannot be made because of small changes that have slowly occurred, the gender gap and issues in agriculture remain a topic of contention.

Most people living without a clean drinking-water source in Tanzania reside in rural areas. By the end of 2011, for example, 83% of the rural population lived without access to an improved-water source (WHO & UNICEF, 2013). Unsafe water sources may be categorized as surface water and other unimproved sources. Surface water is collected directly from rivers, lakes, ponds, and irrigational channels. Unimproved sources include unprotected dug wells and unprotected springs and water delivered by cart or tanker.

A landmark study about domestic water use and environmental health in three African countries—Uganda, Tanzania, and Kenya—made the connections between poverty, gender, and the environment with water access (White, Bradley, & White, 1972). The study, *Drawers of*

Water: Domestic Water Use in East Africa, investigated a major problem of water that continues to haunt humanity in many parts of the world. G. F. White, one of the authors, described their experience during an interview with Reuss:

> We went into about 35 different sites and inquired about how people decide to use water. . . . We did something which is rudimentary but nobody had done before. We found out where they got their water, how much they used, and what it cost them to use in terms of time, energy, and health. . . . In almost all cases people have alternative sources from which they can draw water. Thus, they make two decisions everyday: how much water they draw, and where they will go to get it, which involves who will go to get it, generally it was a *she.* Reuss quoted (as cited in Kates, 2011, p. 6).

The study was later duplicated by a Drawers of Water II Team that included senior African researchers led by Thompson (Thompson & Cairncross, 2002). The longitudinal study investigated whether or not there were any changes in domestic water use compared to the original data gathered by White et al. (1972). Water quality and quantity, domestic use, and other variables indicated changes, yet the role of women, as the main supplier of water resources, had not changed.

An analysis of 25 countries in sub-Saharan Africa "estimated that women spend a combined total of at least 16 million hours each day collecting drinking water; men spend 6 million hours; and children, 4 million hours" (UNICEF & WHO, 2012, p. 31). The burden of time and energy is unevenly distributed by gender roles as dictated by customary norms. Children and women in rural areas collect water on average four times per day requiring 25 minutes for each trip (Nelson et al., 2012). As a matter of fact, a global trend is that women are mostly responsible for securing and managing water resources (see Figure 5). Consequently, the task of collecting water prevents young girls from attending school and women from engaging in other productive activities (WaterAid America, 2013).

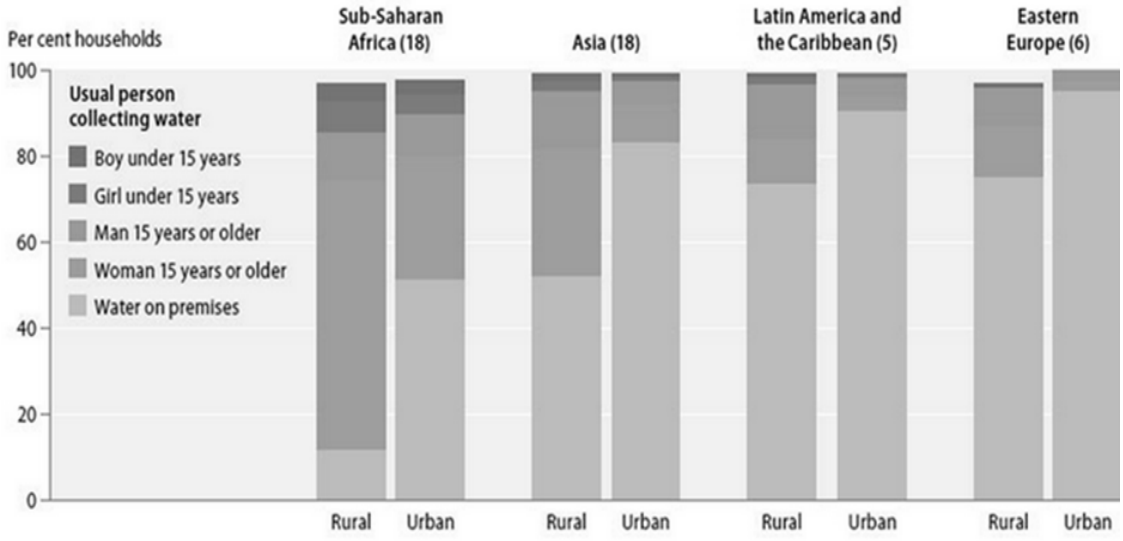

Figure 5. Distribution of households by person responsible for collecting water. From *The World's Women 2010: Trends and Statistics* (p. 143), by United Nations Department of Economic and Social Affairs, 2010. Reprinted with the permission of the United Nations.

Definition of Sustainable Development

A review of the literature related to the concept of sustainable development reveals that there is an abundant amount of research in sustainability science with distinctive but overlapping disciplines. Kates (2001) identified four distinct research-based programs dedicated to the science and theory, the practice, and the action of sustainability. These four research-based programs are (a) biological, (b) geophysical, (c) social, and (d) technological. This study focused on social research, which is centered on the people and the planet. Kates (2001) described it as "how human institutions, economic systems and beliefs shape the interactions between societies and the environment" (p. 20).

In 1987, the World Commission on Environment and Development (WCED)—also known as the Brundtland Commission—presented *Our Common Future*, a report that united development initiatives with the environment and equity. Since the introduction of this report,

sustainable development has remained at the forefront of the global agenda. In *Our Common Future,* sustainable development was defined as follows:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two concepts: The concept of "needs," in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. (WCED, 1987, p. 37)

Since the Brundtland Commission offered this definition, others have evolved over the years. However, this definition still remains the most cited and commonly used in multidisciplinary fields. The use of the concept derives from an array of motivations by the stakeholders, including advocacy, research, and policy-making. Stakeholders representing various fields, institutions, nations, and localities have included sustainable development as part of their mission and vision statements associated within their purpose area. The Brundtland definition is embraced as the one that allows stakeholders from various fields to interpret it to fit their aspirations and goals. However, many also describe it as vague and elusive. Critics of sustainable development argue that the term is complex, ambiguous, fluid, unspecific, and open to interpretation (Ciegis, Ramanauskiene, & Martinkus, 2009).

In 1992, the Declaration on Environment and Development described sustainable development "as long-term continuous development of the society aimed at satisfaction of humanity's needs at present and in the future via rational usage and replenishment of natural resources, preserving the Earth for future generations" (UN, 1992). The special significance was the inclusion of environmental concerns to equitably meet the development issues and to protect the present and future generations. Dernbach described the notion of development as four related concepts: (a) peace and security, (b) economic development, (c) social development, and (d)

national governance (as cited in Ashford & Hall, 2011, p. 9). These four concepts reflect the outcomes of treaties and international agreements.

All definitions of sustainable development agree on implications related to basic beliefs of social justice and equity; concepts of needs and limitations; questions of what to sustain and what to develop; three dimensions involving economic, social, and environmental factors; and time orientations of present and future generations. The definition from the Brundtland Commission proposed the concept of *needs* and the idea of *limitations*. The concept of needs intertwine with development initiatives targeting the suffering of the underprivileged, suffering that is caused by poverty, disease, illiteracy, and marginalization. Similarly, the idea of limitations emphasizes the needs of the planet and the deterioration of the environment while considering the needs of the present and the future.

In regard to sustainable development, time orientation underscores the ethical considerations and issues of social justice and equity in the present time, referred to as intragenerational, and in the future, referred to as intergenerational (Soubbotina, 2004). Parris and Kates (2003) observed that "sustainable development has broad appeal and little specificity, but some combination of development and environment as well as equity is found in many attempts to describe it" (p. 559). Discourse on what is to be sustained, what is to be developed, how to link environment and development, and for how long a time emanate from studies that attempt to give context to time orientation (Goodland, 1995; Kates, 2010; Redclift, 1987). In 2013, global conversations about future development and environmental efforts remained grounded on the concept of sustainable development, which continued to advance through UN conferences, agendas, and declarations.

History of Sustainable Development

There are several developmental and environmental initiatives from policymakers, scholars, and private industries that promote the evolution of sustainable development, many of which are rooted in global initiatives led by the United Nations. Much of the literature on sustainable development is referenced in the context of a UN conference, declaration, or report. As a result, this section on the history of sustainable development focuses on significant milestone events led by the UN. Some of the major highlights are shown in Table 4.

Academic researchers and policy analysts have studied sustainable development since the 1960s. Yet, it was not until 1972, in the UN Conference on the Human Environment in Stockholm, Sweden, that the concept gained international awareness. The conference highlighted two important points: (a) the issue of degradation and the abuse of natural resources and (b) the understanding that Earth has limited resources (United Nations Environment Programme [UNEP], 1972). The resulting Stockholm Declaration marked a milestone in transferring local and national environmental concerns into an international dialogue on global ecological issues (Brunnee, 2009).

According to the WCED (1987), "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 15). This concept of sustainable development is grounded in the belief that inequities of the poor in the present generation should not be a legacy to pass on to future generations. Thus, there is a need to balance aiding the poor and protecting the world's natural resources (Kates, Parris, & Leiserowitz, 2005; Stoner & Wankel, 2008). The green revolution movement, which focuses on protecting environmental resources while building sustainable communities, changed the relationship between people and the planet (Clark, 2010).

Table 4

Significant Milestones in Sustainable Development From the UN

YEAR	LOCATION	CONFERENCE	KNOWN AS	DECLARATIONS & RESOLUTIONS
1972	Stockholm, Sweden	UN Conference on the Human Environment (UNCHE)	The Stockholm Conference	Declaration of the UN Conference on the Human Environment
1987	Oslo, Norway	World Commission on Environment and Development (WCED)	The Brundtland Commission	*Our Common Future* (also known as the Brundtland Report)
1992	Rio de Janeiro, Brazil	UN Conference on Environment and Development (UNCED)	The Earth Summit	*Agenda 21*
2000	New York, NY	UN Millennium Development Goals (MDG)	The Millennium Summit	The Millennium Declaration
2002	Johannesburg, South Africa	World Summit on Sustainable Development (WSSD)	Earth Summit 2002, World Summit, or Rio+10	The Johannesburg Declaration
2012	Rio de Janeiro, Brazil	UN Conference on Sustainable Development (UNCSD)	Earth Summit 2012 or Rio+20	*The Future We Want for All*

Anand and Sen (2000) asserted that "the growing concern with *sustainable development* reflects the basic belief that the interest of the future should receive the kind of attention that those in the present generation get" (p. 2030). The need for development interventions was reinforced in the

late 1980s when many African countries were suffering from a variety of calamities. Poverty, hunger, droughts, and the HIV/AIDS pandemic, among other crises, created a profound impact on many sub-Saharan African countries. These interconnected events reinforced the concept of a sustainable development approach towards eradicating poverty.

In 1992, the UN held a Conference on Environment and Development in Rio de Janeiro, Brazil. The resulting document, known as *Agenda 21*, was a collaborative agreement adopted by participating nations calling for an action plan to address some of the more pressing issues of that time period. It reaffirmed the commitment from wealthier nations to help disadvantaged ones, such as those in sub-Saharan Africa. Many African countries were besieged by debt and indebtedness was one of the problems that prevented some developing countries from achieving progress in their development efforts. As a result, wealthier nations were encouraged to take an active role in addressing the problems of external debt burdens (UN, 1992). A global partnership for sustainable development to address the ills of poverty, marginalization, and environmental degradation, shaped strategies related to debt burden, equity issues, education, health care, and the rights of women. Initiatives were born out of a shared belief that the integration of environment and development would provide for a better future as long as all nations worked together to meet measurable goals (UN, 1992).

Beyond statements or dreams, world leaders pushed for a set of key indicators to help identify, monitor, and measure progress across disciplines. The ultimate goal of setting measures was to achieve sustainable development within its three dimensions: economic, social, and environmental. During the same time period, African leaders were challenged to address a combination of social and economic degradations due to poverty, hunger, and disease. Two of

those socioeconomic issues were water and disease. In 1992, 1.3 billion people in the world lacked access to safe water, and 2.3 billion people lacked access to sanitation.

The ideals of development and protecting the environment progressed when the Millennium Declaration was unanimously approved by UN member nations and 23 organizations on September 8, 2000. The Millennium Declaration became an international pledge to achieve time-bound MDGs by the year 2015. The UN adopted the Millennium Declaration and implemented MDGs in several disciplines, which were widely communicated and embraced by global and local communities. Being different from other promises to eradicate poverty, the MDGs were systematically and comprehensively established with resources to finance, implement, measure, and advocate them. International and local governments allocated funds, identified indices, and published reports to monitor progress. These MDGs sought to address daunting inequities and environmental concerns that hindered improvement of social and economic conditions of the poorest nations.

In 2002, the UN hosted the World Summit on Sustainable Development in Johannesburg, South Africa, also referred to as Rio+10 or Earth Summit 2002. This summit provided a forum for global leaders to recommit and reaffirm prior UN declarations 30 years after the Stockholm Declaration of 1972 and ten years after *Agenda 21* of 1992. There was a realization that the planet's natural resources and the needs of the poorer nations had to be balanced with those needs of the more developed countries. World leaders recognized that poor and rich countries had to work together to achieve sustainable solutions to economic, social, and potential environmental catastrophes. Furthermore, developed nations agreed to participate in a solidarity fund to eradicate poverty by donating 0.7% of their national income to the fund (UN Millennium Project, 2002-2006). Of special interest in the literature of that time period are the references to

the different priorities of the developed and developing countries; these same countries were sometimes referred to as the North versus the South or rich countries versus poor countries. Conflicting agendas to advance development efforts sometimes clashed with those of the environment. Despite the controversies, the Earth Summit 2002 directed a pathway to improve lives and ecosystems while considering population growth and natural resource degradation. Although dialogues among nations reflect the opposing priorities of the North and South, conversations remained grounded in the belief that development and environment are problems of humankind.

Ban Ki-moon, Secretary-General of the UN, proclaimed:

> Eradicating extreme poverty continues to be one of the main challenges of our time, and is a major concern of the international community. . . . The goals are ambitious but feasible and, together with the comprehensive UN development agenda, set the course for the world's efforts to alleviate extreme poverty by 2015 (UN Millennium Campaign, n.d.).

Lack of access to water, gender inequalities, disease, and a disproportionate array of problems in Africa attracted the attention of international policymakers. The 2001 International Conference on Fresh Water in Bonn, Germany, brought to light that 1.2 billion people in the planet still lived in poverty without access to safe drinking water, and that approximately 2.5 billion people did not have access to proper sanitation (Rogers, Jalal, & Boyd, 2006). Similarly, 58% of those infected with the HIV virus in 2002 were African women. Kofi A. Annan, the former Secretary-General of the UN, reported on the ravaging effects of the HIV pandemic on African women and girls. He said:

> When she dies, the household will risk collapsing completely, leaving children to fend for themselves. The older ones, especially girls, will be taken out of school to work in the home or the farm. These girls, deprived of education and opportunities, will be even less able to protect themselves against AIDS. (Annan, 2002, para. 7)

In 2012, world leaders met again in Rio de Janeiro, Brazil to attend the UN Conference on Sustainable Development, also known as Rio+20. World leaders discussed development and environmental issues, the status of the MDGs, and potential follow-up initiatives after the MDGs deadline in 2015. The major outcome of the Rio+20 conference was the agreement to initiate a post 2015 development agenda that would continue beyond the MDGs by identifying a set of Sustainable Development Goals (SDGs). Major successes of the MDGs included global awareness, agreement on measurements, and producing good reports for better communication. Yet, a main criticism was the lack of inclusion of major stakeholders in their development and measures. The proposed post 2015 development agenda seeks to remedy the process by engaging academia, civil society, and additional stakeholders in the creation of a set of SDGs to be founded on prior efforts from UN initiatives. The SDGs propose a vision to be shared by UN member states in which human development advances are attained while honoring the ecological limits of the planet (UN System Task Team, 2012).

Three Dimensions of Sustainable Development

According to Jiliberto, sustainable development is not based on the economic, social, ecological, or institutional dimension, but rather on "their *system* as an *integrated whole*" (as cited in Ciegis, Ramanauskiene, & Martinkus, 2009, p. 33). Sustainable development integrates three dimensions: economic, social, and environmental as a holistic, shared belief that prosperity, justice, and security can be achievable as global priorities. These dimensions are consistently present in a multitude of disciplines, and they are considered part of the decision-making process. The three dimensions have evolved in their depiction, representation, and significance over time. But, they are still recognized as necessary to eradicate poverty and protect the human environment.

Descriptions and representations range from a pillar approach, to three overlapping spheres, to a nested approach with general sustainability based on all three (Goodland, 1995). Studies exploring the three dimensions consider each dimension in itself and its relationship with the other dimensions to achieve sustainability. Rogers et al. (2006) asserted that sustainability is a term used to interconnect with development and environment. Griggs (2013) nested concept demonstrates the changes in the population, the society, and the earth since the early 20th century. Figure 6 illustrates the accelerated growth of the economy and society beginning in the 1950s but the planet remains with finite resources. Human activities may have a negative impact on the earth's ecosystems.

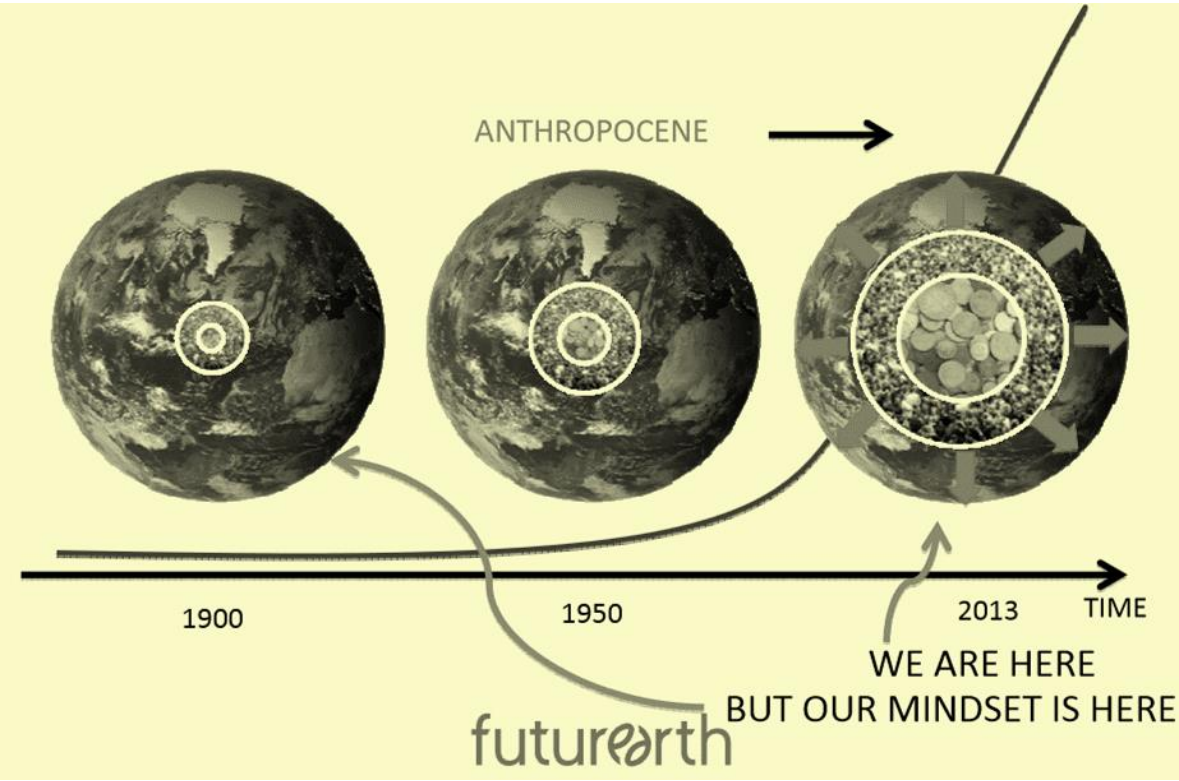

Figure 6. Rethinking Sustainable Development in the Athropocene. From "From MDGs to SDGs: Key Challenges and Opportunities" by D. Griggs. 2013, *Future Earth*, p. 19. Reprinted with permission (see Appendix F).

Economic dimension. The economic dimension is usually linked to economic growth, access to financial markets or services, and entrepreneurial opportunities. Economic rationality is a premise that goods are produced efficiently enough so that they can be sold at a competitive cost (Ayala-Carcedo & González-Barros, 2005). Measures dominating the literature on economics include consumption and spending patterns, supply and demand of goods and services, and the impacts on global, national, and local economies across sectors. Economic growth is represented in the gross national product (GNP) per capita, which increases over time.

Despite the efforts of international programs, such as the UN Development Decade for Women from 1975 to 1985, and other organizations to promote gender equity, women in several sub-Saharan African countries still suffer exclusion and discrimination (Dibie & Dibie, 2012). African women's access to economic resources has been slow due to gender roles and unequal opportunities in formal education, including science and mathematics (Beoku-Betts, 1998). Traditionally, the role of women has been focused in agriculture, which provides a glimpse into their substandard economic progress for subsistence. Tanzanian women provide 80% of the labor force in agriculture and generate 60% of the food (Boakari, 2004), which shows that rural women are critical agents for enhancing the food supply, food security, and nutrition. The concept of *livelihood*s conceptualizes the "economic activities poor people undertake in their totalities" (Adato & Meinzen-Dick, 2002, p. 2). Charman (2008) studied the impact of democratization and liberalization of agricultural services on gender gains by women of Southern Africa. A bottom-up approach, training in crop production, and access to finance and loan services promoted the position of women and their subsequent feelings of empowerment. Yet, an array of socioeconomic issues prevents women not only from participating fully in society but also from reaching their potential. In addition, a chiefly patriarchal society prevents

women from attaining equitable access to education and employment opportunities (Nkuba, 2007).

The role of African women might be better understood by examining the historical perspectives (Boakari, 2004) and tacit assumptions. Land ownership is critical for economic development and subsistence in many African societies. According to formal civil law, women may own property but the customary law prevails over civil law in some cases. For example, old customs and tribal laws have denied African women land ownership, with a devastating economic impact on entire female-led families. Cohen (2006) observed that women, particularly widows, would be destitute of their land after their husband's death. It is customary law that they gain access to their husbands' land while married, but women's property rights end if their entitlement of land was based on their marriage. However, with the assistance of changing government, institutions, and NGOs, African women have slowly gained rights in land ownership and have slowly entered the economic development process (Dibie & Dibie, 2012).

The economic status of women who reside in rural areas is disadvantaged by additional factors, such as lack of access to health care, scarce educational opportunities, assigned gender roles, and poor water availability. Difficult access to water precludes women from growing their business, attending school, and keeping healthy. It is estimated that more than "fifty percent of Tanzanians in rural areas have no access to safe drinking water, and in some areas the proportion of people with access to clean potable water is lower than twelve percent" (Yohannes, 2008, p. 117). The process of supplying water keeps women from engaging in income-generating activities because of the enormous amount of time and effort invested in obtaining water on a daily basis. Outside interventions have not been sustainable as a result of economic, financial, and technological constraints. For instance, Huby and Stevenson (2003) studied intervention

models that were meant to improve the water supplies of the rural people in Tanzania. However, these "dig-install-depart" models, implemented by well-meaning organizations, failed to succeed (Huby & Stevenson, 2003, p. 196). Their findings showed that short-term interventions and early withdrawals without community participation, and more importantly, the lack of input from women led to the failure of these water projects (Huby & Stevenson, 2003).

In contrast, the microcredit revolution inspired by Yunus (2007) has been quite successful. Microlending changed the economic paradigm for millions of people who did not have access to financial services in the past. Rural women of Tanzania, for example, have improved their economic situation as a result of obtaining small loans to seed microenterprises. Access to economic resources to improve livelihoods as a means to address social problems aligns with the ultimate goal of Yunus "to relegate poverty, once and for all, to poverty museums" (Yunus, 2007, p. 231).

Social dimension. The social dimension encompasses several topics: health, education, governance infrastructure, women and children's issues, and population growth. Health and education concerns continue to expand as a result of accelerated population growth. Much has been written about population growth and the pressures on economic, social, and environmental dimensions (Chambers & Conway, 1992; Goodland, 1995). However, this study limits the social dimension to the lives of rural women pursuing social opportunities and seeking empowerment through social networks. Social sustainability is essential in development because poverty has both a cause and effect association to economic resources and environmental degradation. Moreover, the idea of freedom and choosing a life that people value is at the heart of social justice and personal empowerment (Sen, 1999). One such freedom is the issue of water, which is essential to life. As Feldman (2007) stated, "water is the economic, social, and cultural lifeblood

of humanity" (p. 1). Lack of access to clean water prevents women from attending school, accessing economic activities, and participating fully in society. Furthermore, studies on domestic water supply indicate that an adequate supply of clean water could reduce waterborne infections and improve hygiene (Thompson & Cairncross, 2002; White et al., 1972). In a study of 120 women in Ogun, Nigeria, researchers found that the water scarcity and drudgery of water collection caused 15.94% of women who collected the water to be tired. In addition, they suffered through an array of waterborne illnesses, educational constraints, and farm productivity issues (Otufale & Coster, 2012). As long as rural women have to travel several times each day to transport water, it will be impossible to fulfill the promise of poverty eradication and the achievement of the MDGs. As reported by several agencies and institutions, decades of global campaigns to bring water into every home have not reached enough households.

Capacity-building initiatives that were offered to disadvantaged rural people, like the women in Tanzania, reportedly led to expressed feelings of empowerment (Ettling & Gonzalez, 2011; Riutta, 2007). Women, including those women of BUWEA, have taken steps to address the issue of water by accessing training on how to build rainwater harvesters. Improved access to water has been recognized as a catalyst to increase women's participation in social agencies through training opportunities and to increase women's health and nutrition (WGC, n.d.b). Boakari (2003) stated that "social justice is an umbrella concept that tries to explain and describe the basic principles of equality, equity, respect for the dignity of other people, and respect for the environment" (p. 5).

Environmental dimension. The environmental dimension refers to preserving the genetic diversity of life-support systems: water, land, forestry, fisheries, livestock, and healthy ecosystems (Rogers et al., 2006). The environmental dimension seeks to preserve the natural

environment for present and future generations. The promise of people living in harmony with the planet promotes the awareness of human activities so that they do not create man-made catastrophes or threaten ecological systems. Harris (2007) stated, “the global stock of water is finite” (p. 11). His statement suggests that natural resources are limited, not growing nor expanding like society and the economy. Although environmental catastrophes are a shared global concern, the magnitude of environmental impacts may be more severe in developing countries that are already disadvantaged. Deforestation, water scarcity, air pollution, and climate changes pose a shared threat to livelihoods with poor people bearing a higher risk (UNDP, 2013).

With this perspective, this study focused on environmental issues as they relate to rural women and water. Women must be recognized as equal partners in finding solutions to sustainable initiatives by using a community-based participatory approach (Chambers & Conway, 1992). Indigenous people are more astute to climate changes and can serve as human sentinels because they understand evolving environmental conditions. Scientists are recognizing the traditional ecological knowledge as “the cumulative body of knowledge and beliefs that has been handed down through generations by cultural transmission” (Berkes & Folke, 2000, p. 5).

For example, local and noteworthy participatory contributions are credited to the late Dr. Wangari Muta Maathai. Dr. Maathai was a Kenyan environmental and political activist and recipient of a Nobel Peace Prize in 2004 for her contribution to sustainable development and peace activities (The Nobel Foundation, 2004). Development initiatives were enhanced by Maathai’s vision to plant trees as a green movement to conserve the earth. Inspired by Maathai, groups of women joined in her efforts to become active participants to conserve the environment and to address other social and economic issues, such as water scarcity. In fact, easier access to

water, in many cases, means that water still needs to be boiled for safe consumption. In addition, water collection initiatives require regular checking to ensure the water is free of environmental contaminants.

For many rural women, like those women in Tanzania, the hard work of transporting water goes beyond physical hardships. Environmental variations are putting strains on the ecosystems and people. Changes in weather patterns, for example, have affected the productivity of farm work for women. Otufale & Costner (2012) observed that such changes "manifested as pressures on women's time, income, nutrition, and health, social support network and knowledge" (p. 42).

The contaminated sources of domestic water are associated with high rates of waterborne illnesses, such as malaria, typhoid fever, diarrhea, and stomach problems. Poor populations suffer disproportionately from these waterborne illnesses, which are the leading cause of death in children less than five years old (Hutchings et al., 2012).

Summary

This study is centered on the Tanzanian rural women and their experiences with improved access to clean water. Hence, the study focused on the social research within the science of sustainability. This review of related literature first discussed the issues of water, especially in Tanzania, and how these issues keep rural women from participating in economic growth, from seeking educational opportunities, and from living in a healthy environment. Furthermore, this review discussed the definition, the history, and the three dimensions of sustainable development.

As demonstrated by the literature from the UN, institutions, and academia, global efforts to achieve equitable goals beyond the MDGs reflect the importance of sustainable development.

Although the MDG Number 7—to halve the proportion of the population without safe drinking water by 2015—was achieved, the problem remains with 768 million people who continue to suffer from lack of easy access to water (UNICEF, 2013b). In short, the issue of justice is at the heart of sustainable development. And water is essential to achieving economic, social, and environmental justice.

Chapter 3: Methodology

Inquiry System

The purpose of this qualitative case study was to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water. I chose the qualitative research paradigm for this study because it was the best method to answer the research questions (Creswell, 2009; Schram, 2006; Yin, 2011). In addition, the qualitative research allowed these rural women to share their views and experiences in their own voices in regard to sustainable development. Furthermore, I used Maxwell's five goals of qualitative studies as a guide for this study:

1. Understanding the meaning, for participants in the study, of the events, situations, and actions with which they are involved;
2. Understanding the particular context within which the participants act and the influence this context has on their actions;
3. Identifying unanticipated phenomena and influences and generating new "grounded" theories around the latter;
4. Understanding the processes by which the events and actions take place;
5. Developing causal explanations. (as cited in Bickman & Rog, 2009, p. 215)

In line with a case study methodology (Creswell, 2009), I visited four villages, collected data, and interviewed the participants in their natural setting. The natural approach supported the "understanding of humans as they engage in action and interaction within the context of situations and settings" (Merriam, 1998, p. 41). The participants invited me to join them in activities that provided insight into their experiences, such as a walking to the old water source in Kishanje, washing and cleaning with local laundry plants in Kabale, and washing and drying cassava for flour production. Other research inquiry strategies included an inductive analysis of documented data about the BUWEA, their strategic plans and goals, and their clean water project. All the different types of research procedures gave voices to the participants and gave meaning to their lived realities (Creswell, 2009; McMillan, 2004).

Research Questions

The following central questions of the study sought to explore the local meanings of sustainable development and improved water sources.

1. How was life of rural women from the Kagera region in Tanzania before the rainwater harvester project, and how did it change as a result of it?
2. How did the rural women from the Kagera region in Tanzania perceive and experience the economic, social, and environmental impact as a result of easier access to water?
3. As a consequence of the rainwater harvester project, what did they seek to sustain, and what did they seek to develop?

The Case Study Design

The case study design is recognized as a qualitative research method that uses multiple sources of data to understand local perspectives and experiences. Creswell (2009) defined a case study as "an in-depth exploration of a bounded system based on excessive data collection" (p. 439). According to Yin (2011), a case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 23). In this study, I used a case study design to investigate rural women's perceptions and experiences of sustainable development and water. Specifically, I examined the economic, social, and environmental impact of the BUWEA clean water project, which involved building rainwater harvesters, on the participants and their communities. This case study captured the BUWEA participants' own words as a method to understand their local perceptions and to capture deeper meanings of their experiences with the rainwater harvesters (Marshall & Rossman, 2006).

In May and June 2013, I traveled to Bukoba, Tanzania, for a two-week period to collect data. I stayed in Bukoba and visited the villages of Kishanje, Kabale, Bilongo, and Nsisha, all of which are part of the Kagera region, to interview the participants in their natural environment. Hence, the study was inductive in nature, grounded in *ontology*—the living experiences of the participants' natural world—and in *epistemology*—how those experiences were internalized and understood (Bogdan & Biklen, 2003; Trochim, 2001; Yin, 2013). Several themes emerged based on the experiences and stories of the bounded system, which in this study were the rural women from the Kagera region who participated in the water project.

Case Setting

Since its inception, BUWEA has strived to motivate and support rural women with microenterprise activities amidst poverty and HIV/AIDS. In 2006, the group officially registered under Tanzanian law as a nonprofit organization that empowers its members by promoting education and economic development. BUWEA raised the economic status of women through business training and participatory approaches to group projects (Nkuba, 2007; Sseruwagi, 2012). As of 2013, BUWEA comprised 394 members divided into 68 economic advisory groups, mostly indigenous women around the Kagera region in Tanzania. The small group format of the organization allows BUWEA to communicate more effectively, to make better decisions, and to resolve problems.

In 2003, BUWEA formed an important long-term partnership with Women's Global Connection (WGC), a U.S.-based nonprofit organization, to give its members business knowledge and other educational opportunities. Workshops and communication via immersion trips, the Internet, and a website allowed a strong relationship to emerge between the two nonprofit organizations. Their relationship has been guided by a threefold collaborative process

known as the principles of the empowerment model: local ownership, social empowerment, and sustainability (see Figure 7). Each of these terms is explained as the following:

1. *Local ownership* assures that women, in particular, gain access to resources, claim their power and shape their own lives. In-country participants are expected to be active partners in planning and implementing activities that are culturally sensitive.
2. *Social empowerment* requires that participants are able to replicate the capacity-building activities with others.
3. *Sustainability* insists that each of the initiated projects can be viable and sustainable into the future without WGC's presence. Emphasis is put on developing local and national networks that strengthen the project's long-term survival. (Ettling & Gonzalez, 2011, p. 5)

The principles of empowerment model was used by BUWEA to guide their own organization and inspire its members to follow those three principles. BUWEA strengthens the empowerment and socioeconomic capacity of its members by offering courses on local issues, such as agriculture, animal husbandry, computer technology, water, sanitation and hygiene (WASH), microbusiness, and self-development.

Figure 7. Principles of empowerment model. From "Research Capacity Building," by Women's Global Connection (n.d.). Reprinted with permission (see Appendix G).

Projects and various initiatives under BUWEA's leadership for all of its members include encouraging members to (a) open credit and savings accounts; (b) provide financial services, such as microloans; and (c) promote entrepreneurial activities. With outside assistance, the group built a soy manufacturing plant, a milling station, a learning center, and a kiosk where the members sell the products they produce, such as eggs, baskets, and batiks. Simultaneously, the learning center and kiosk serve as a gathering place when group members travel to Bukoba from their remote villages.

Background to the Case

The BUWEA women in Tanzania were selected for the research study because of their holistic approach to poverty reduction and my involvement as former executive director and volunteer of the WGC. In addition to microlending activities for small businesses, the group undertook other projects to improve the lives of its members and communities. These other projects consisted of hosting capacity-building workshops, building and operating a soy manufacturing plant and milling station, and building rainwater harvesters. The BUWEA women understood the suffering of the rural women living in remote areas because the founding members and current leaders were rural women themselves. The group used multiple approaches in their fight against poverty and lack of education by getting involved in activities meant to achieve sustainability: activities associated with microlending, computer training, the learning center, and the members' kiosk. BUWEA also embraced projects that were grounded on sustainability with their WGC partners. As a result, professors and doctoral students interested in BUWEA and the WGC have studied various themes, such as female leadership (Buck & Holbrook, 2013), the use of technology (Caffer, 2006), the understanding of social agency (Nkuba, 2007), and the participatory approach (Sseruwagi, 2012).

The WGC's circle of sustainable development model reflects WGCs systematic way of collaborating with partners when developing sustainable projects (see Figure 8). The WGC developed this model based on its partnerships with BUWEA and other women's groups in the United States, Zambia, and Peru. The education of children under seven years-old and girls, for example, involves collaborating with local educators to develop lesson plans. Workshops designed to build local capacities focus on a variety of topics in business, life-skills, and technology, and they are based on the expressed needs of BUWEA and other women's groups. The WGC engages in a community-based participatory approach to collaborate and engage with BUWEA, which continues to grow its microloan activities and its projects, such as the clean water project.

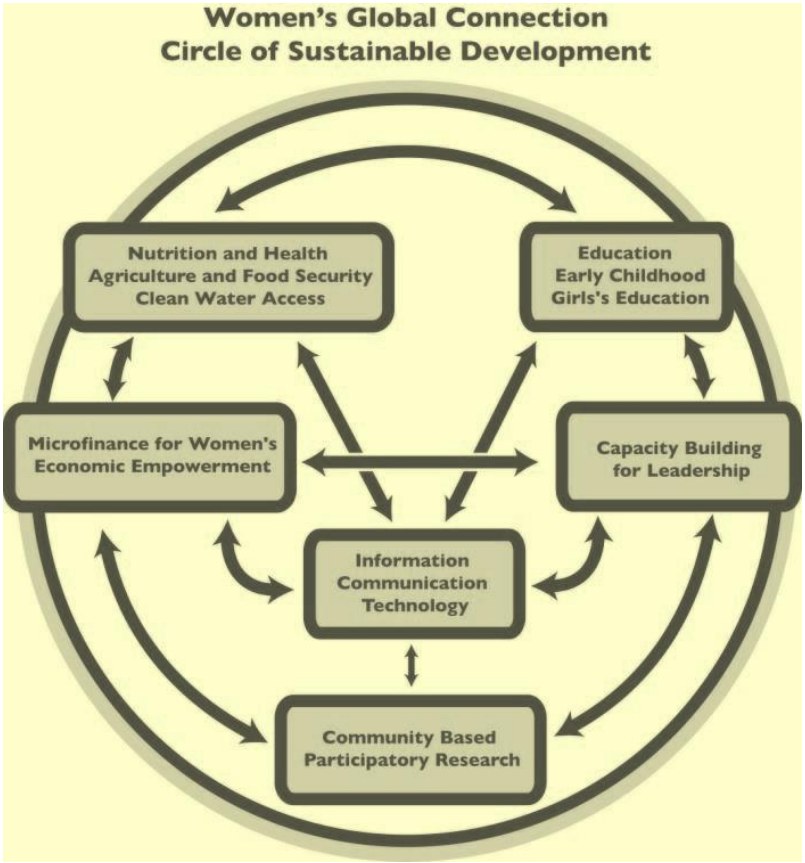

Figure 8. Circle of sustainable development. From "Research Overview," by Women's Global Connection (n.d.). Reprinted with permission (see Appendix G).

In 2008, the WGC surveyed 50 women from three villages in the Bukoba District—Kishanje, Itahwa, and Kabale—to assess the extent of water as a problem in their lives, their families, and their communities. The results showed that 80% of the women obtained water through carrying it from rivers and streams on an average of 30 minutes each day. Twelve of the respondents carried water over 45 minutes each way and sometimes walked up to four hours. The majority carried water containers, each holding 20 L, over 2 km or more. The respondents reported carrying 60 to 80 L approximately three to four times a day. The survey further reinforced the economic, social, health, sanitation, and hygiene concerns.

Various alternatives to transporting water were discussed and considered among BUWEA members, Bukoba water officials, and WGC volunteers. Two of the alternatives that were discussed were digging out wells and using Hippo water rollers, which are barrel-shaped containers that can transport 90 L of water per trip. Further research showed that the water wells and the Hippo water rollers offered unsustainable solutions because the water wells were found to dry up in the rocky ground of the hills, and the Hippo water rollers would have been impractical to use in the rocky upward terrain of Kishanje and other villages. Therefore, these ideas were not implemented. Then, BUWEA and the WGC shared the water concerns, the information, and the results of the water survey with the Bukoba Water and Sanitation Authority. The BUWEA and WGC consultations with local government leaders and water engineers served a threefold purpose: (a) to pay their respects to local officials, (b) to make sure they were not duplicating efforts, and (c) to encourage collaboration with them. These consultations confirmed that there were no immediate plans to support the water needs of the villages (personal communication, 2013).

In 2011, the WGC provided a grant to BUWEA to sponsor a two-week training opportunity sponsored by the Global Women's Water Initiative (GWWI) in Kampala, Uganda. The GWWI, a program of the Women's Earth Alliance, teaches women water and sanitation technologies, which include the construction of rainwater harvesters to collect and store water. The lush Kagera region experiences an average of two rainfalls per month as reported by the Geological Office; thus, BUWEA embraced the idea of building rainwater harvesters. Two BUWEA leaders attended the GWWI workshop where they learned about issues of water, sanitation, and the maintenance and construction of rainwater harvesters. With the help of the GWWI and the two BUWEA members who attended the training session in Kampala, the first rainwater harvester designed to collect 10,000 L was built in Kishanje in 2011. Rainwater would be harvested from the roofs into the tanks through metal gutters. A technician from the GWWI provided oversight for the construction of the tank while BUWEA and Kishanje trained local people on how to build the rainwater harvester and test the water. Kishanje was selected as the first village to have rainwater harvesters because of its dire need for improved access to water. Located on a plateau, the members suffered a daily struggle providing water for their families. Unlike most of the villages where access does not require people to walk down the hill for several kilometers, Kishanje suffered from its hilly location and difficult path to the water source. Local members contributed by providing local materials, labor, cleaning, and food for the builders. Ongoing contacts with the local authorities on the construction of the rainwater harvester secured support from the government authorities.

In 2013, BUWEA acquired an interlocking stabilized soil brick (ISSB) brick-making machine to produce rainwater harvesters. This technology is preferred over the traditional oven-fired bricks because it uses local materials at a lower cost and less cement. Additional training on

how to care for and to repair the tanks, to test the water, the sanitation, and the hygiene promoted the sustainability of the project (personal communication, July 2012). The resulting four rainwater harvesters and reviews of the water situation in all the member villages sparked the vision to respond to a critical need by continuing to build improved sources of water in the villages. By 2013, the BUWEA women had built eight rainwater harvesters in the villages of Kishanje, Kabale, Bilongo, and Nsisha, which were selected based on the most pressing need for improved access to water.

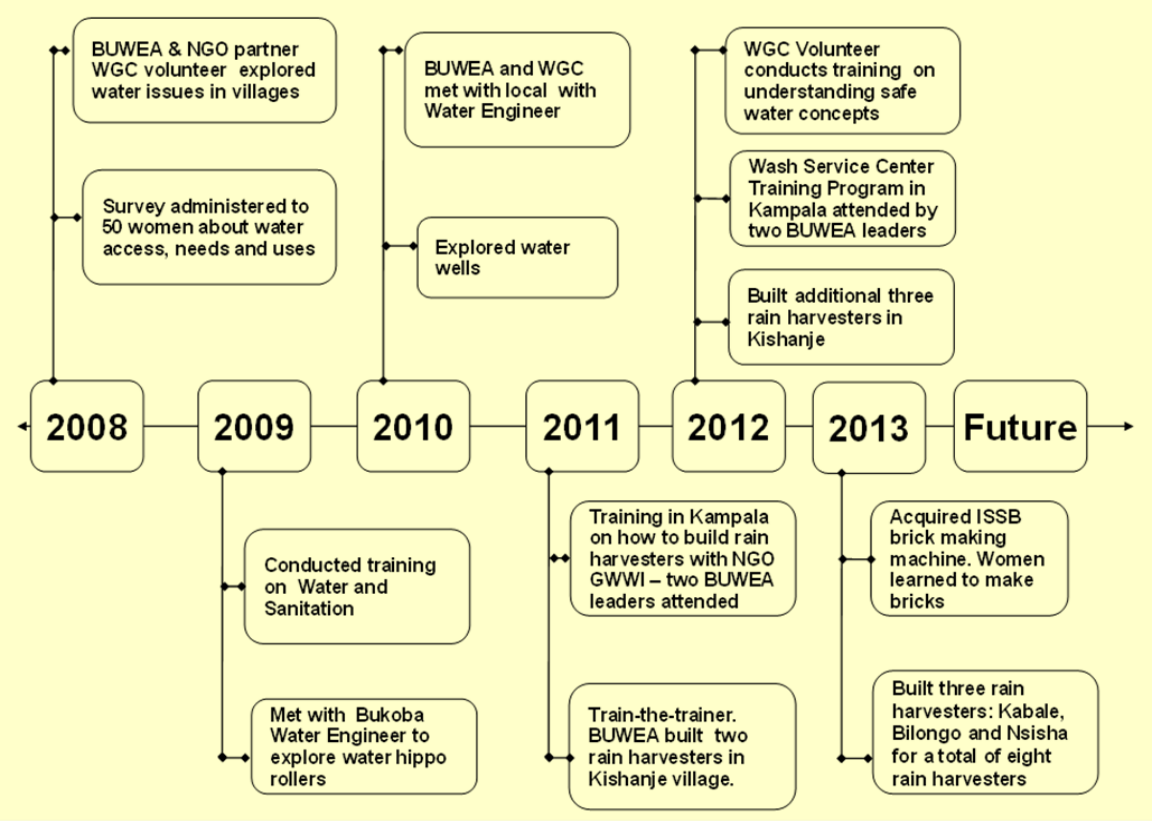

Figure 9. BUWEA water project.

Chronology of the BUWEA water project. Figure 9 and the following chronology of the BUWEA water project illustrates a snapshot and summarizes the information provided in this section.

2008 BUWEA meets with a WGC volunteer. A survey is administered to approximately 50 members to assess issues of access and safe water. Afterward, BUWEA meets with the Bukoba Water District Commission to discuss plans.

2009 The WGC volunteer conducts training on water and sanitation and meets with BUWEA members to discuss the Hippo water roller. BUWEA meets with the Bukoba Water District Commission once more with new employees.

2010 BUWEA and the WGC explore water wells with the Bukoba Water District Commission. But, the water wells in the area are not functional. The Bukoba Water Engineer says the government has no plans to build more wells.

2011 The WGC pays for two BUWEA members to participate in a water workshop sponsored by the GWWI in Kampala, Uganda. Using a train-the-trainer model, some BUWEA members receive training to build two rainwater harvesters in Kishanje.

2012 WGC volunteers conduct training on water, sanitation, and hygiene (WASH) with a focus on safe water concepts. Two BUWEA members attend additional water workshops, known as the Wash Service Center Training Program, sponsored by the GWWI in Kampala, Uganda. Three additional rainwater harvesters are built in Kishanje. And BUWEA continues to collaborate with the Bukoba Water District Commission.

2013 BUWEA acquires an ISSB brick-making machine from Kenya. BUWEA members make bricks to build rainwater harvesters in Kabale, Bilongo, and Nsisha. As of June 2013, eight rainwater harvesters have been built.

Selection of Participants

The participants for this study were BUWEA members who have been associated with the improved access to water project through the construction of rainwater harvesters. Participants consisted of three groups: the BUWEA leaders, the emerging leaders, and the village members. Their roles were the following: (a) the leaders set strategies and held positions within the organization, (b) the emerging leaders held administrative positions and were leaders of the villages, and (c) the village members were women in the villages who built the rainwater

harvesters. The inclusion of these three sources offered different points of view on sustainable development. A total of fifteen interviews were conducted, including eleven individual interviews and four group interviews. The eleven individuals that were interviewed were three BUWEA leaders, three emerging leaders, and five village members.

The BUWEA leader and the administrator, acting as gatekeepers, identified the village participants who met the criteria for the study. Therefore, only women involved in the clean water project were interviewed. I solicited support from the BUWEA leaders to interview members in their homes and close to the water sources. The participants' interviews began once the purpose of the study was explained. Additionally, the participants' consent was obtained, both verbally and in written format.

A lesson from the collectivist society of Tanzania was received when women of Kishanje, Kabale, and Bilongo participated in the group interviews to share their views and experiences. The original plan to interview ten participants associated with the water project was modified to include individual members who met the criteria and wanted to participate in the study as individuals or as part of a group. The interview process was further adapted when in the middle of the tape-recorded interviews the women of Kishanje stopped the process to invite me to travel to the old source of water. Walking the narrow pathway surrounded by high thorny shrubs offered an accurate view of the water collection routine.

In order to gain a better perspective of the rainwater project, the two leaders who had participated in the training of the rainwater harvesters and the ISSB brick-making machine were interviewed about the project. Interpretation was further enriched by "honoring local ways of relating and knowing" (Bogdan & Biklen, 2003, p. 85). Furthermore, cultural sensitivity was applied based on competence in cross-cultural values and on my relationship with the

participants. I had collaborated with BUWEA members in the past five years by virtue of my former position as executive director and volunteer of the WGC. As Liamputtong (2008) stated, "knowledge in social, familial, religious, historical, and political backgrounds considers the differences and similarities of culture and customs" (p. 4).

Role of the Researcher

A characteristic of a qualitative study is that the researcher is the key instrument for collecting data (Creswell, 2009). McMillan (2004) stated that "in qualitative studies the investigator usually acts as an observer in the setting that is being studied, either as the interviewer, or as the person who studies artifacts and documents" (p. 258). My academic journey was enhanced by first joining the WGC as a volunteer. Subsequently I became the executive director while pursuing a doctoral degree at the University of the Incarnate Word (UIW). I learned about the WGC, its work, and its partners during my first doctoral course in the fall of 2005. I have also participated in annual immersion trips to Tanzania, Zambia, and Peru.

My relationship with the BUWEA members began in 2007 and was strengthened by subsequent annual visits to Bukoba, Tanzania, with the WGC volunteers. During the first visit to evaluate a potential water project for rural BUWEA women there was a conversation with the Bukoba water engineer in which he declared that "the issue of water is the issue of women" (personal communication, July, 2009). Then, he further explained the harsh realities of local rural women's lives: "They have to carry water on their heads for several kilometers and work up to eighteen hours per day to provide for their families" (personal communication, July 2009). Both the experiences and the collaborations provided an opportunity to enter the participants' world and influence the decisions of the research study (Yin, 2011).

In addition, the idea to seek local meanings of sustainable development was motivated by global events—for example, the MDGs and the SDGs—and by the leadership, teamwork, and growth of the members of the BUWEA group. Collaboration with the local group remained grounded in respect for the culture, appreciation of local ownership endeavors, and results of group activities, all of which led to empowerment and sustainability of projects (Ettling et al., 2010). A feeling of respect and sense of kinship with the BUWEA women grew from working on projects and visiting during immersion trips. Although there are limitations that may impede the view or interpretation of data, Bickman and Rog (2009) suggested that "experiential knowledge and the researcher's identity may generate unexpected insights and connections" (p. 224).

Increased interest in the topic of water emerged after witnessing the efforts to alleviate the hardships of living without easy access to water and visiting the water officials who commiserated with the problem. I became familiar with the rainwater harvester project from its inception while other water collection alternatives were explored. BUWEA became the leader and owner of the water project with training and financial support from the WGC and other NGOs.

Fieldwork is not only a way to enter the participants' world, but also an opportunity to learn, to develop relationships, and to become involved in the participants' activities (Bogdan & Biklen, 2003). Strauss and Corbin (1990) stated:

> Choosing a research problem through the professional or personal experience route may seem more hazardous than through the suggested (by faculty) or literature routes. This is not necessarily true. The touchstone of your own experience may be more valuable an indicator for you of a potentially successful research endeavor. (pp. 35–36)

Most of the people I encountered in Tanzania welcomed me into their lives and culture to learn more about their water situation. There was curiosity about my background and it was not

unusual for participants to ask why I was there and ask personal questions. My familiarity with the hotel staff, the BUWEA team, and the Bukoba town facilitated the process of investing all of my efforts into the research study. The gatekeeper, who also arranged for transportation, scheduled the village visits. Walks to the BUWEA office, grocery store, or bookstore were convenient, and sometimes I was accompanied by one of the hostesses. The hotel chef, the waitress, and the room staff extended a hospitable welcome that felt like a real *Jamii,* a Swahili word for family.

I felt safe at home even though I was thousands of miles away from my permanent home and on a different continent. I admit to having positive feelings about the BUWEA group and Tanzania. Therefore, additional steps were taken to remain objective throughout the study. In the data collection analysis, I separated the data from the data source, guided the study on theoretical frameworks, reviewed documents related to the water project and the organization, and examined other research studies involving BUWEA.

Data Collection and Procedure

Multiple data collection methods were used to gather information from the BUWEA members. In June 2013, I traveled from the United States to Tanzania to conduct individual and group interviews and to make observations directly from the field (Trochim, 2001). Strauss argued that "no proposal should be written without preliminary data collection and analysis" (as cited in Trochim, 2001, p. 286). Although I did not collect data until approved by the established guidelines, my previous on-site experiences aided the conceptual analysis beyond theory, methods, and empirical studies. I had traveled to Bukoba, Tanzania on four different occasions while serving as the executive director of the WGC. During the fourth immersion trip to Bukoba in 2012, a three-week trip, I spent the final week evaluating potential topics and methods for the

research study. An intellectual curiosity about the issues of water and sustainability from the BUWEA efforts cemented the decision to pursue research about the rainwater harvester project. I had transitioned from executive director of the WGC into a role of full-time doctoral student. In my new role I was able to minimize potential bias from my prior role.

I received a warm welcome by two BUWEA founders who patiently waited outside the baggage area in the small Bukoba airport. One was the CEO of the organization acting as gatekeeper, and the second one was the BUWEA secretary and a member of the water team responsible for the construction of the rainwater harvesters. The ride to the hotel offered a view of Lake Victoria, the lush vegetation, and the bustling activities of Bukoba. It is a growing town sitting on the western shore of the second largest freshwater lake in the world. Ironically, the abundance of water in the region does not extend to the population, especially those people living in rural areas, who transport water manually as a result of poor infrastructure.

In preparation for the study I spent time in the BUWEA office to learn about the groups' plans and projects, including their goals and objectives on the clean water project. BUWEA shared information that had been submitted to funding organizations. The information included the lack of access to clean water as an important problem leading to disease and poor health. BUWEA identified the problem of water to be solved, provided the baseline documentation collected at the villages, gave input in the form of strategies to address the problem and output as progress indicators, requested necessary resources, and showed outcomes related to water.

I met with BUWEA's gatekeeper, translator, and secretary to review the following documents related to this study: the Interview Protocol, the Consent Form, and the IRB form. Interviews, logistics, and other activities were planned to enhance the interviews and the time in the field. The BUWEA leader and the administrative assistant confirmed the participation,

interview times and other logistics. A detailed schedule of each day maximized the outcomes of the study, but it was flexible enough so that I could explore the localities. Moreover, I took detailed notes in a field journal and gathered observations to capture the richness and in-depth meaning of the data (Creswell, 2009). The villages' natural surroundings with the corresponding rituals, such as the informal conversations at teatime, were part of the in-depth interviews and observation process.

Based on Schram's (2006) recommendations I followed his four key ethical considerations in establishing trustworthiness: (a) posturing and presentation of self, (b) disclose and exchange, (c) making public the private, and (d) disengaging and staying in touch. I learned the various forms of communication and rituals of the group through previous immersion trips and as a result of my past work with the women. Details ranged from sitting arrangements, to addressing visitors, to sharing meals, all of which are representative of a collectivist society. In addition, I was aware of nonverbal communication in the form of the participants' body language to include gestures, haptic (touch), and proxemics (distance).

Interviews with the group were held in a variety of settings. Some interviews took place in Bukoba: in the BUWEA office, the hotel, the soy manufacturing plant, and in BUWEA members' homes. Others took place in the villages of Kishanje, Kabale, and Bilongo. The in-depth interviews were conducted using a list of open-ended questions based on the purpose of the study and the research questions. The interviewing process was guided by an Interview Protocol, which included demographic data, past and present experiences with access to water, economic, social, and environmental impacts of the rainwater harvesters, and sustainability questions. Various types of communications were noted to include verbal communication,

observed nonverbal communication, and participants' stories, perceptions, and experiences related to the inquiry.

During the interviews, data were recorded using a digital tape recorder to facilitate the process of transcription. Similar to using interviews as a way to solve mysteries, I sought to capture the words, realities, relationships, and other empirical material, using creativity and idea-generation (Alvesson & Karreman, 2011). Additional observations were made when visiting Nsisha to witness the construction of the eighth rainwater harvester and to Bunena, the site of a soy manufacturing plant, a brick-making machine, and a cassava processing machine. Language barriers in the field were minimized through extra efforts from the participants to help me, especially during the workshops on how to produce soy milk and yogurt and the installation of the cassava processing machine.

Protection of Human Subjects

According to Marshall and Rossman (2006), "role, access, data collection, storage, and reporting serve as reminders" (p. 89) in reference to the role, the ethics, and the accountability of the researcher. Approval from UIW's Institutional Review Board (IRB) was obtained to conduct the study (see Appendix A). Then, I completed the required coursework from the Collaborative Institutional Training Initiative (CITI; see Appendix B). A Consent Form, written in English and Kiswahili, was reviewed at the beginning of each interview (see Appendix C), along with the purpose of the study and the IRB form. The Consent Form explained that (a) all information was confidential, (b) participation was voluntary, (c) participants had the choice to withdraw from the study at any time without harm or penalty, and (d) there were no physical risks related to participating in the study. Specifically, anonymity was maintained by giving a pseudonym to each participant. In addition, the names of the participants appeared neither in the data collected

nor in the demographic data. I obtained a signed copy of the Consent Form from each participant. All tape-recorded interviews and transcripts remained in my possession or were securely locked.

Data Analysis

Creswell's (2003) six-point method served as a guide for data analysis: (a) organizing and preparing the data for analysis, (b) reading through all the data, (c) beginning a detailed analysis using a coding process, (d) using a coding process to give a description of the setting or people as well as categories or themes for analysis, (e) advising on how the descriptions and themes will be represented in the qualitative narrative, and (f) interpreting the meaning of the data (pp. 218–222).

In order to prepare the data for analysis, the English recorded interviews were first transcribed and the Kiswahili tape-recorded interviews were translated and transcribed by a virtual translator. Second, the interviews were organized without the participants' names. After reading through all the transcripts, the key words, quotes, and sentences were coded. Documents and field journals containing verbal communication, observations, thoughts, records of nonverbal communication, and descriptions of the environment were similarly coded and included in the analysis of the data.

The two theoretical frameworks this study relied on were Sen's (1999) capability approach and Parris and Kates' (2003) taxonomy of sustainable development goals. Sen's (1999) capability approach described freedom in the following manner:

> Freedom is central to the process of development for two distinct reasons.
> 1. The evaluative reason: assessment of progress has to be done in terms of whether the freedoms that people have are enhanced;
> 2. The effectiveness reason: achievement of development is thoroughly dependent on the free agency of people. (p. 4)

The two theoretical frameworks served as a guide to identify and sort broad categories and to color code the data. Different colors and index cards were used to identify patterns to collapse into codes and categories, which were later merged into themes. Parris and Kates' (2003) taxonomy of sustainable development goals guided broad themes within the economic, social, and environmental domains when considering what needs to be sustained and what needs to be developed.

Yin (2013) cited five different techniques to analyze the data, such as pattern matching, explanation building, time-series analysis, and cross-case synthesis (pp. 142–168). These general strategies were considered to look for preliminary findings and general themes. Yin's (1994) recommendation of having a general analytic strategy was followed. If one strategy was absent, then a second strategy that relied on a descriptive approach was recommended. Yin's (1994) definition of analysis served as a guide: Analysis is the process of "examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study" (p. 102). Hence, the data from various sources and locations were examined, organized, and catalogued into different open categories. Concurrently with gathering data, I wrote reports that reflected, interpreted, and analyzed the data to identify patterns and themes. Maxwell recommended that the process of analyzing data should begin immediately, though other authors prefer to wait until all interviews are completed to avoid biases from early findings (as cited in Yin, 2011). Aided by the digital tape recorder, field notes, and reports, I spent time with the leaders and the translator to clarify and analyze each day's activities. A reflective field journal was specifically used to capture daily visits, personal observations, and field activities at the research site. These detailed notes were extremely important because they minimized assumptions. Therefore, there was a lesser need to rely on memory to obtain information.

Furthermore, the process was useful when asking for clarification and feedback from the interviewees, which enriched the data analysis process.

Trustworthiness and Credibility

Qualitative research is characterized as an interpretative research, influenced by my values, biases, gender, and culture (Creswell, 2009). Likewise, Marshall and Rossman (2006) indicated, "triangulation of qualitative data allows for multiple perspectives" (p. 54). I recognized my role with the WGC in shaping the interpretation of the study, and thus the need to follow rigorous strategies to establish its trustworthiness and credibility. A reliable paper and audit trail, e-mails, journals, interview notes, audiotapes, and field notes reduced the risk of conclusions being limited by own bias and memory. In addition, I employed the "practical considerations in establishing trustworthiness" method suggested by Schram (2006, p. 133). Figure 10 shows the three areas of consideration needed to establish trustworthiness: consequences of presence, selective experience, and engaged subjectivity. Consequences of presence means that the choices and constraints in fieldwork provide various possible interpretations, and thus "Credibility does not demand certainty." (Schram, 2006, p. 134). Selective experience is related to the need of choosing and interpreting based on purpose, circumstance, intuition, and empathetic attributes. Engaged subjectivity means that choices must be made, thus the importance of monitoring and acknowledging subjectivity as a way to enrich the study (Schram, 2006).

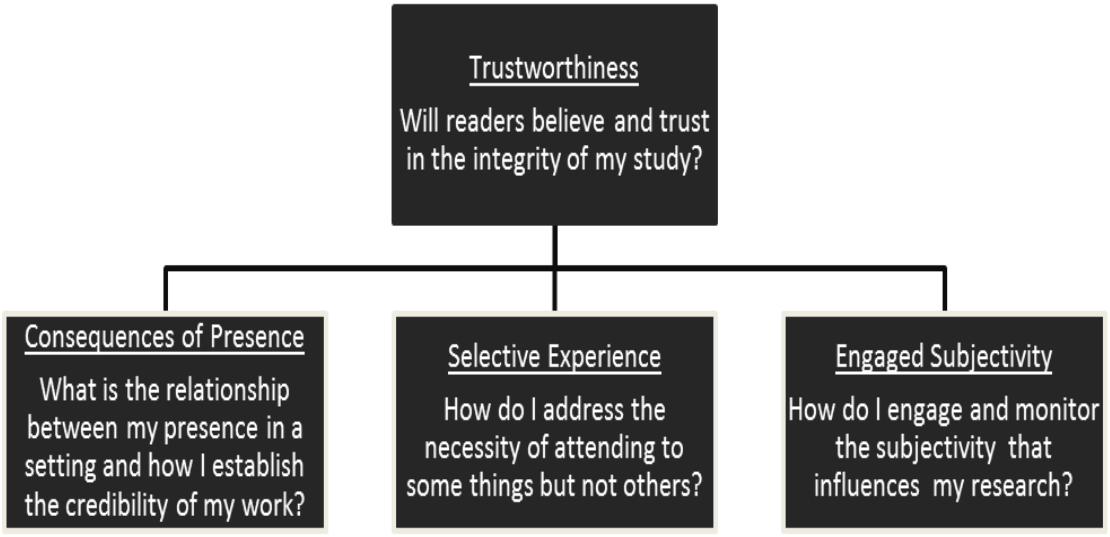

Figure 10. Practical considerations in establishing trustworthiness. From *Conceptualizing and proposing qualitative research* (2nd ed., p. 133), by T. H. Schram, 2006, Upper Saddle River, NJ: Pearson. Reprinted with permission (see Appendix G).

My familiarity with the BUWEA women and the water project inspired me to abide by the interview protocols and ethical standards, and I was sensitive to participants' interactions. I collected the qualitative data by tape-recording the interviews, making observations and listening, writing in field journals, and reviewing documents pertaining to BUWEA and the water project. I participated in some of the BUWEA activities in the role of a participant-observer. Analysis of the data extended beyond fieldwork into a period of several months, in which the interviews, field journals, and documents from BUWEA and the WGC provided the information for in-depth reflections. Subsequent communication with the BUWEA women via e-mail exchanges and review of the documents enhanced the triangulation of the study.

Maher's (2003) model of reflection, the cognitive-experiential tri-circle, is based on the belief that "in-depth of experience and in-depth of reflection are equally related" (p. 95). This study engaged in the dialogue of the issues of water and of sustainable development by incorporating the voices of the people participating in their own development. Consequently,

training on the ethical considerations of strict adherence to research protocols was critical in order to establish the trustworthiness and credibility of the study.

Summary

This chapter summarized the process of selecting the qualitative paradigm for the research study, which sought to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water. A discussion of the qualitative research questions, the qualitative methodologies, the research design, my role as the researcher, how participants were selected, the protection of human subjects, and qualitative analysis were provided. The qualitative data were collected from participants through individual and group interviews, observations, BUWEA's plans and documents, fieldwork, and field journals.

Chapter 4: Findings

Introduction

The purpose of this case study was to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water. The following central questions of the study sought to explore the local meanings of sustainable development and improved water sources.

1. How was life of rural women from the Kagera region in Tanzania before the rainwater harvester project, and how did it change as a result of it?
2. How did the rural women from the Kagera region in Tanzania perceive and experience the economic, social, and environmental impact as a result of easier access to water?
3. As a consequence of the rainwater harvester project, what did they seek to sustain, and what did they seek to develop?

The participants of the study were all BUWEA members who were associated with the rainwater harvester project. The diversity of participants and village locations contributed to the data collection process of examining different views, experiences, and localities. The data were derived from eleven individual interviews, four group interviews, observations, field journals, and documents pertaining to BUWEA and the water project. All fifteen interviews were recorded with a digital tape recorder in English, Kiswahili, and Kihaya with the help of an on-site translator.

A case study methodology was selected to investigate rural women's perceptions and experiences of sustainable development and water in their natural environment. The study was grounded on two theoretical frameworks to connect the empirical data to the questions and the purpose of the study: Sen's (1999) capability approach, which assumes that development is the

"expansion of the *capabilities* of persons to lead the kind of lives they value—or have reason to value" (p. 18), and Parris and Kates' (2003) taxonomy of sustainable development goals. The selection of these theories allowed for the study to be situated in a larger context and to integrate pieces in a logical manner (Radhakrishna et al., 2007). The concept of sustainable development is deeply grounded in the belief that inequities of the poor in the present generation should not be a legacy to pass on to future generations. Concurrently, there is a need to balance aiding the poor and protecting the world's natural resources (Kates et al., 2005; Stoner & Wankel, 2008).

Overview of the Setting

Kates (2001) wrote about his and his family's experiences living in Tanzania and said, "there we learned from East Africans the values of extended family, of dignity amid poverty, and of humor in the face of adversity" (p. 8). Similarly, there was a warm openness from the local people, including the BUWEA members who allowed me into their lives and culture to learn more about their water situation. The BUWEA leader invited me to visit her husband on a Sunday afternoon and to enjoy a special meal consisting of spinach, carrots, bananas, beans, fish, rice, and cabbage. Ten years earlier, the husband suffered a massive stroke with a high degree of disability and rehabilitation needs. He welcomed me and socialized until the food was served. With his wife at his side, he struggled to converse as she patiently waited without interrupting or finishing his sentences. The love and respect emanating from this couple was heartfelt.

Travel to the villages allowed for on-site visits to interview participants, conduct group meetings, observe the surroundings, and collect data. In a village where there were no rooms for the meeting, the women built temporary walls made out of embroidered fabrics. The floors were covered with hay, the entrance doors made of banana leaves, and the spaces decorated with colorful flowers. Every trip with BUWEA women reminded me of running weekend errands

with family. The old van stopped at every village road intersection to collect produce from the members, to check the construction of the rainwater harvester, and to drop off grains at the milling station. Mobile phones played a pivotal role in the social fabric of the communications and economic interdependence as in other parts of East Africa (Mehta, Maretzki, & Semali, 2011). It was a privilege to be present when the soy and cassava processing equipment arrived, when it was installed, and when it ran product for the first time. The new technology caused delight and wonderment that was infectious as the women continued to remind me that none of those activities would have been possible without water.

Family members, neighbors, and several children were usually present in those activities, allowing me to interact and gain other perspectives. Open-ended interviews in the members' homes enhanced the opportunity for deeper discoveries of a collective and hierarchical society. I learned, for example that a local delegation of farmers, NGO representatives, and local government officials had toured the soy manufacturing facility because BUWEA had earned the respect of the local community and now serves as a role model to other groups. After first introductions with polite questions about my Hispanic background, the visitors conducted their regular business. A workshop on how to prepare soy milk presented another opportunity to collaborate with the women. The class instruction was in Kiswahili. With the instructor's help I was able to follow the steps of the soy milk preparation by writing notes and participating in exercises to minimize language barriers. This was an effort to blend into the routine "without interfering with the ongoing flow of everyday events" (Marshall & Rossman, 2006, p. 124) and rewarded me with deeper insights into daily activities.

Researcher's Reflection During Data Collection

Despite being divided by two continents, language, and race, the women openly shared their lived experiences and sensitive issues of water. It was an exchange that enriched my scholarly and personal journeys that included sharing meals, learning about their microbusiness, and holding their babies. Freire (1970) stated, "the learner's capacity for critical knowing—well beyond mere opinion—is established in the process of unveiling their relationships with the historical-cultural world *in* and *with* which they exist" (p. 17). Aronowitz declared:

> Education takes place when there are two learners who occupy somewhat different spaces in an ongoing dialogue. But both participants bring knowledge to the relationship, and one of the objects of the pedagogic process is to explore what each knows and what they can teach each other. (as cited in Freire, 1998, p. 8)

I walked (for only) two hours in their shoes to the old water source in Kishanje in an authentic effort to glimpse into their lives. It was a momentary view of the duties and the hardships of the rural women's unimaginable journey that I was entrusted with telling.

Overview of the Demographic Data

The participants in this study were 23 BUWEA members who met the criteria outlined in Chapter 3. Literacy among the members was 100%. Nonetheless, they preferred completing the demographic survey as a group. Selected demographic data included the following: (a) marital status, (b) age, (c) number of years of school, (d) number of children, (e) advisory group, and (f) type of income-generating activities (see Table 5 for demographic data a–d).

The 23 participants of the study belonged to eight different economic advisory groups. All the women were involved in income-generating activities, such as crops, animal husbandry, handicrafts, and food production. At the beginning of each interview, I explained the purpose of the study and reviewed the IRB form (see Appendix A) and the Consent Form (see Appendix C). I conducted the interviews using the Interview Protocol as a guide (see Appendix D).

Table 5

A Demographic Overview of Participants

Participant	Marital status	Age	No. of years of school	No. of children
Angela	Married	25	7	3
Carolina	Married	48	7	3
Esther	Widowed	79	4	6
Rena	Widowed	52	7	6
Adelina	Married	27	7	3
Paulina	Widowed	50	7	5
Agatha	Married	39	7	4
Merisa	Married	36	7	6
Kalisa	Widowed	53	7	7
Rhonda	Married	35	7	5
Flora	Married	49	9	4
Joyce	Married	56	7	5
Nancy	Married	57	7	9
Sharon	Married	50	14	3
Rosemary	Widowed	56	12	3
Georgina	Married	67	12	6
Julien	Married	63	12	7
Pamela	Married	54	16	5
Agnes	Married	45	12	4
Judith	Married	26	7	2
Moureen	Widowed	48	7	6
Roda	Single	19	12	0
Yulitha	Married	28	7	1

Emerging Categories

After the data were collected I transcribed the tape recordings of eleven individual interviews and four group interviews. Three participants were interviewed both as individuals and as part of a group. As a group, they contributed to the strategic and operational focus of the rainwater harvesters due to their training in Kampala, Uganda. Data were furthered translated and transcribed into Kiswahili with the services of a virtual translator to capture the participants' own words. The field journals were also analyzed in order to examine, organize, and catalogue the data collected from various sources and locations during the on-site trip. Concurring with Yin's (1994) suggestion to have an analytical strategy, I relied on theoretical frameworks to approach the analytical process.

As a result, the emerging categories from the interviews, observations, field journals, and BUWEA documents revealed that water issues went beyond the building of the rainwater harvesters. There were also deeper conversations about the BUWEA organization and its own sustainability. After listening to the tape-recorded interviews and carefully reviewing the notes I produced a list of sentences and words that intertwined with the perception and the experiences of sustainable development as a result of an improved water source: "we are creative, we are inventive," "lives were terrible," "couldn't have known me without the group," "share ideas," "happy because donors come with big projects," "would be sick," "water is life," "good communication," "training makes the motivation for the project," "more healthier, we see that we are moving on," "no quarrels," "share ideas," "tired," "fatigued," "miss school," "get beatings," "dirty water," "contaminated," "build more tanks," "we repair them." Reading through all the text data and labeling these categories with codes allowed me to collapse them into themes that led to the findings of the study.

Analysis of Findings

Various forms of data were analyzed to answer the research questions. Member and group profiles included eleven individual interviews and four group interviews. The group interviews consisted of participants from the villages of Kishanje, Kabale, and Bilongo, and the women who attended training in Kampala, named the Water Team. The before and after the rainwater harvester inquiries asked participants about how life was like before building the rainwater harvesters and how their present life changed as a result of it. The participants also identified the economic, social, and environmental impact they experienced as a result of easier access to water. In addition, the participants answered sustainability questions associated with the rainwater harvester project. This analysis of findings was the inquiry that led to the findings of the study: adverse conditions associated with water collection, evidence of improvements in every dimension of sustainable development, and common themes resulting in a BUWEA model of sustainable development (see Figure 11).

The combined findings illuminated the central phenomenon of the study, which was rural women accessing an improved water source and its implications. Table 6 shows the adverse conditions that participants associated with water collection. These conditions include time, fatigue, illness, punishment, quarrels, safety, and contamination. Table 7 shows evidence of the economic, social, and environmental impact of the rainwater harvesters. Table 8 shows the four themes that emerged when the participants were asked what they sought to sustain and what they sought to develop after building the rainwater harvesters. Those themes are membership, partnerships, group projects, and empowerment.

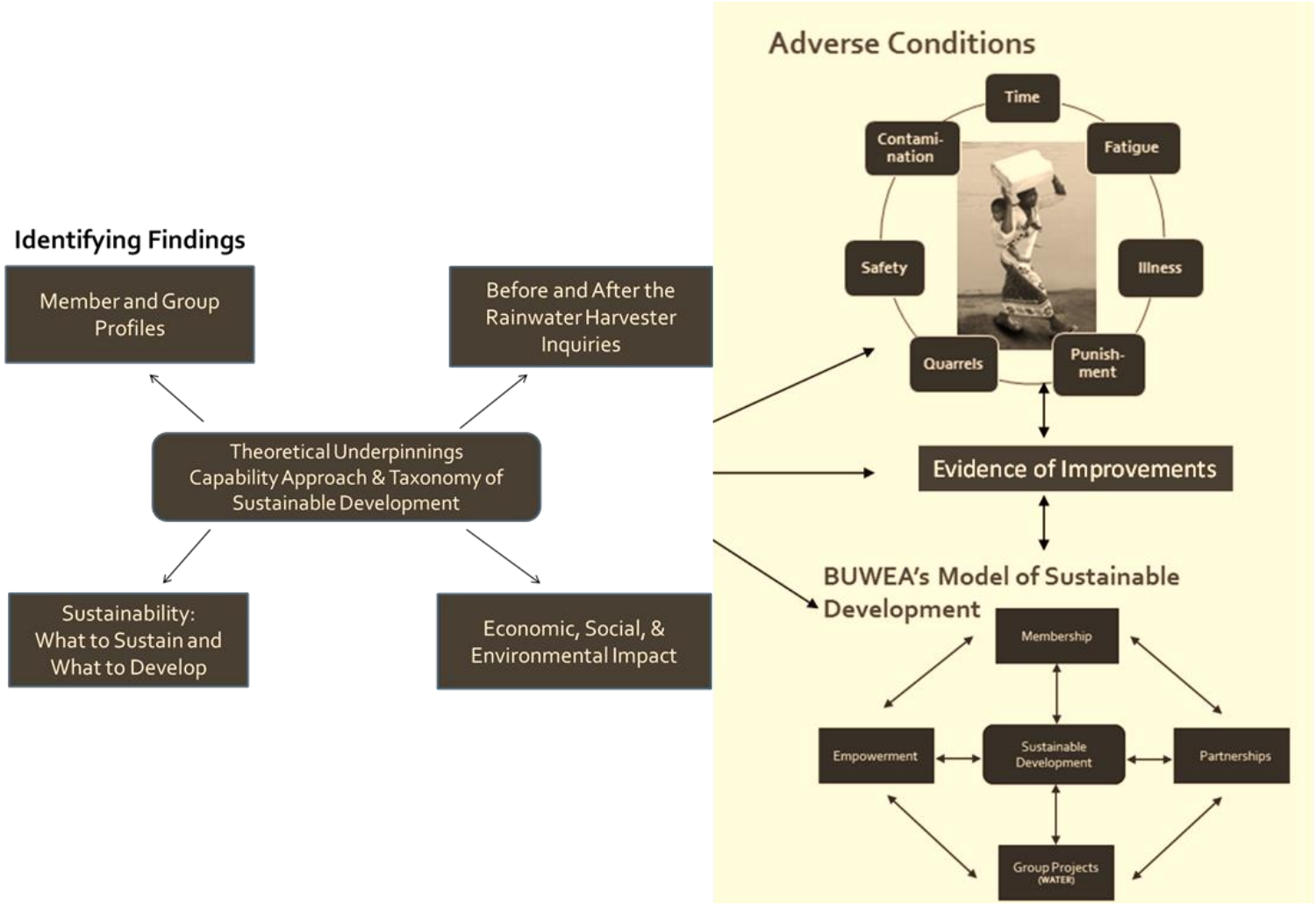

Figure 11. Analysis of findings.

Overview of the Data Collection

This overview of the data collection is divided into four sections. The first section presents member and group profiles, which include demographic data and narratives from a total of fifteen interviews. The group interviews were composed of groups from three villages—Kishanje, Kabale, and Bilongo—and the Water Team. The second section discusses before and after findings about how life was like before building the rainwater harvesters and how their present life changed as a result of it. The economic, social, and environmental impact as a result of easier access to water is discussed in the third section. And the fourth section explains what the participants sought to sustain and what they sought to develop.

Member and group profiles. The following narrative profiles provide an introductory background and brief insights into the motivations of the BUWEA members and their support of the water project. A pseudonym was given to each interviewee in order to maintain confidentiality. The group interviews from the villages of Kishanje, Kabale, and Bilongo are also included in the narratives. The real names of the villages were kept in order to recognize each village's rainwater harvester project. The final narrative describes views from the Water Team who attended training in Kampala to learn how to build rainwater harvesters and to discuss issues of sanitation and hygiene.

Table 6

Adverse Conditions Associated With Water Collection

Theme	Participants' Quotes
Time	Women walk long distances to get water and when you go to the village, you find that people waste a lot of time to fetch water. They would have used that time to do other things. In my opinion, we should maintain the water harvest project, and God willing we will strengthen BUWEA to help others get the water harvesters because we are many. (Rosemary, personal communication, June 7, 2013)
Fatigue	And also if you can carry so much water on the head then it gives pain to the head and also to the back. So the process is tiresome. (Kishanje, personal communication, June 4, 2013)
Illness	The women are using now the water rainwater harvesters . . . They are healthier than before, I could see their faces, I could see their children stronger. No one was sick at this time because I remember the other time when I went they were suffering from diarrhea but this time less illnesses. (Julien, personal communication, June 10, 2013)
Punishment	I sometimes fell down because the path was very steep and muddy when wet, and I used to go to school very late, and the teachers could beat me almost every day; they did not want any explanation. (Roda, personal communication, June 10, 2013)
Quarrels	Yes, there were quarrels because the woman would say that the water should be used carefully but the man because he does not fetch water would use it and tell the children to go and get more. (Judith, personal communication, June 3, 2013)
Safety	There was also fear of wild animals because many water outlets are found near forests. I was able to organize myself, but the suffering was the same. (Sharon, personal communication, June 4, 2013)
Contamination	We used to get water at the river at first whereby the water [was] somehow clean, but as time went on they were just cutting down trees. The water became more dirty, and sometimes the water dries because there are no trees. One stream has dried up, so all the people who used to fetch there they are all coming to the other lake. So when you go to the river you find there is a line, so you have to be in the line and wait for others to fetch. (Bilongo, personal communication, June 11, 2013)

Table 7

The Economic, Social, and Environmental Impact of the Rainwater Harvesters

Impact	Participants' Quotes
Economic	By uplifting a woman's life, a woman will not walk long distances to look for water. She will have more time for other development projects. For example, the time that she has been using to fetch water, she will be able to plant more beans. (Agnes, personal communication, June 3, 2013)
Social	You know what? Men have changed their attitudes and realized that women can do amazing and sustainable work as or more than men, that is great. I am very proud of that. (Roda, personal communication, June 10, 2013)
Environmental	Water and the environment are related because if you have the harvesters then you don't destroy the environment. We went to the river in Kishanje and many other rivers and found that the water is contaminated because some of the people who go to fetch water there also help themselves in the rivers. But if you have a harvester, someone will get the water and use a toilet and keep the environment clean. And if you have a garden, you will water it and your children will get fresh vegetables. (Agnes, personal communication, June 11, 2013)

Table 8

Four Identifying Themes

Theme	Participants' Quotes
Membership	For me it is of great importance to be in the group because in a group there is different ideas and education where members teach each other on how you can come up with [a] new project or how you can expand existing projects. If you are alone, you can never secure a loan because you are not part of the group. We have managed to get different business[es] and market[s] that we create amongst us, that is why many people want to join BUWEA. (Judith, personal communication, June 3, 2013)
Partnerships	We worked very hard before WGC and nothing happened . . . now look where we are! We cannot forget the support from WGC because they always ask. Without them, we were suffering because of going to the river. We had headaches, foot aches because of going to fetch water, which we are not doing now. (Julien, personal communication, June 10, 2013)
Group Projects	I think they see us in BUWEA, we are together, and we are going forward and doing our things properly. We get a lot of things that we did not have in the beginning; for example, now we have animals, we get loans, and we are doing our development projects. Therefore, when people see us moving forward they want to come and join. (Yulitha, personal communication, June 12, 2013)
Empowerment	We feel good about ourselves. And then I found that they have constructed some of the houses. The houses I saw were not the ones I saw before because they are changing now. It seems they have some money somehow, and some of them said they are engaged in business, some selling fish, some selling bananas, some selling animals, chickens, and pigs. (Julien, personal communication, June 11, 2013)

Member profiles.

Pamela. Pamela is a BUWEA founder, and she proudly described the resourcefulness of the rural women and their ability to provide for their families and their communities. She said, "We are creative, we are inventive" (personal communication, June 3, 2013). Within her family, Pamela's role is that of a nurturer, household manager, and primary caregiver for her children.

She shattered cultural barriers when she pursued a higher education and learned how to drive later in life. Though she lives in Bukoba where water services are available, she grew up in a village where she experienced the hardships of securing water. Building rainwater harvesters with other women, therefore, became a great source of pride for Pamela because she understood the great need for herself and others. Pamela explained the roles and responsibilities of a typical Tanzanian woman:

> So according to the customary law, if they found that there is no water in the house, you are the first one to be blamed that, ah, there is no water, that woman is lazy, that woman is very careless. Why doesn't she go to the river to fetch water? So we feel that it is our responsibility, everywhere where you go, even me at my home. My husband is not easy to get water even from the tap, it is my responsibility for me to bring the water in the bucket to put it somewhere where it can be used. So you can find that it is the responsibility in every family that the woman is to take care and to bring water to the family. So you can find that if water is near women, they can engage in different things. They can go to training. They can go to other activities. They can share with the other women because they are sure that if they come back they can find that water is there. (personal communication, June 3, 2013)

Agnes. Agnes is one of BUWEA's founders and a successful small business entrepreneur. She said, "I am happy and joyful. From deep in my heart I would like to continue to educate women and building the harvesters because I understand the water problem" (personal communication, June 3, 2013). Her small shop in the downtown area displayed creative and elaborate handcrafted batik and African fashions. The confidence and a sense of accomplishment emanated from this leader when we visited the rainwater harvesters in the villages.

> She will sell and get more money. When she gets money, she will uplift her family, pay the children's school fees, she will buy good clothes. (Agnes, personal communication, June 3, 2013)

Moureen. Moureen was inspired to advance her education despite being widowed and having the responsibility to raise her children alone. As an emerging leader, she built rainwater harvesters for the villages. But at the time of the interview, she was still carrying water for her

personal needs. As she explained, there are greater overall needs in other locations. Moureen viewed BUWEA as a support system beyond microlending or a small microenterprise. She viewed the organization as a vehicle out of poverty based on teamwork, peer support, and knowledge. Moureen explained:

> The relationship that we have among ourselves and the working together, helping each other, and the sharing of whatever you have, no matter how small but share it with somebody. If it is the knowledge, if it is in terms of things that you can see but share and that is how we get our knowledge to spread among us and the others. It is through sharing and good relationship among women and the sisterhood. You can hear from others saying that most women groups do collapse, but I think BUWEA will not collapse because of the formation we would like to maintain is that share with others, keep good relationship, and then spread the knowledge. What you have given it to somebody. If they get to know better they won't disturb you. You know it by yourself, they don't know, they will disturb you. (personal communication, June 7, 2013)

Judith. Judith is an emerging BUWEA leader and is focused on responsibilities and teamwork within the organization. She learned how to weave baskets from an older BUWEA member and now uses her craft to help provide for her young family. In regard to the sustainability of the water project, Judith felt it was the village's responsibility to test the quality of the harvested water once the members received the proper training. She explained, "Beneficiaries need to be responsible and accountable for the upkeep of the rainwater harvesters" (personal communication, June 3, 2013). In her opinion, being a BUWEA member demands dedication to being part of a team. Women who join to "just take loans, will lose out on the true benefit of being a BUWEA member, which is to become empowered" (Judith, personal communication, June 3, 2013).

Sharon. Sharon is a Bukoba town member but grew up in the rural Kagera region. Though she lives in the city with running water, there are times water is not available. She still needs to look for water when this occurs. Fatigue plus the fear of getting contaminated water

helps Sharon understand the problems in remote villages, and it motivates her to make bricks for the construction of the tanks for other members.

> I am happy because water is life. . . . When I was a bit older, I started to understand this issue of getting water. I started waking up earlier than usual to go and fetch water or go in the evening, but the situation was the same. The pain was the same because the distance and the hill are still there. (personal communication, June 4, 2013)

Julien. Julien follows a rigorous daily routine of planning, organizing, directing, and implementing projects. She moves with the same ease no matter what she is doing, whether it is caring for family and her family farm, coordinating workshops, developing products, or visiting local dignitaries. A powerful presence, this BUWEA leader modeled behaviors and a strong work ethic every single day during my visit. As a lifelong teacher and a BUWEA founder, Julien believes most rural women became disadvantaged by virtue of gender and limited opportunities for education beyond primary school.

> Most of us didn't go to school. Because of not going to school then you have less knowledge, and you can do less things, and there is no more chance for education for others other than workshops. And where do you get the seminar and workshops? You join BUWEA, that is the only opportunity. Otherwise you are left behind with each and everything. So we need our children now to go to school because that will save them in the future. Our lives are not as good because of lack of education. Where can a woman from a village work? She can work nowhere. It is only there at home with her income-generating activities, that is the thing she gets to know, and she will know better to improve her family. Family status of having income and that is it to feed the family. So we wouldn't like our children to have the same life as we did because we know the hardship we have faced, we wouldn't like our children to face the same problem. (personal communication, June 10, 2013)

Georgina. Georgina is a founder and a member of BUWEA. She lives with her husband and a granddaughter in a cozy house overlooking Lake Victoria. She sells handicrafts out of her home and supplies them to souvenir shops. Like other BUWEA founders, she achieved economic stability once her children finished school. BUWEA motivates Georgina to make a difference in the lives of young rural women. Her own personal experiences of growing up in

rural Tanzania affected her strongly. Georgina remembers what it felt like to not sleep well because she was stressed over having to fetch water.

> Ah, dreaming about going to fetch water, yes. If there is nothing in the bucket and you know you have to cook, you will dream about it because it is the first thing you have to do. It was really terrible . . . but if you know that the water is there then you sleep comfortably. (personal communication, June 4, 2013)

Yulitha. Yulitha is a young BUWEA member, always with a smile. She is a nonstop contributor who provides support to the overall organization through hard work and by accomplishing physically demanding tasks. Yulitha believes that the members should think collectively to empower women so that they may be courageous and independent. She also feels that the sustainability of BUWEA relies on selecting good members and on the generosity of donors. Yulitha described:

> I think they see us in BUWEA, we are together, and we are going forward and doing our things properly. We get a lot of things that we did not have in the beginning; for example, now we have animals, we get loans, and we are doing our development projects. Therefore, when people see us moving forward they want to come and join. Support like workshops that we get will make the group sustainable. The donations that we are getting like now the soy plant, the soy plant will then produce, and then it will make the group sustain. The animal gifts that we are getting they go to multiply and help in the farms. (personal communication, June 12, 2013)

Rosemary. Rosemary is a founding member of BUWEA who made a living by selling used clothing. She remembers when water pumps were placed in various districts in the 1980s and how all of those projects collapsed due to the lack of maintenance and no planning by the government for sustainability. Most of her adult life has been spent collecting water. As her business progressed and her children grew up, she was in a position to pay someone to get it.

> It was the government . . . they put one water pump in districts. They used to pipe water to one section of districts but it was in few areas. For example, like in Karagwe, they would identify one place and put the water there but that was in the old days in the 80s. If you had small kids, then it was difficult. I am talking as a woman and what all the women went through. In the past, I used to go and wash the clothes, and the rivers in Karagwe were very far. (Rosemary, personal communication, June 7, 2013)

Roda. Roda is a young member of BUWEA who is pursuing a higher education. Her intentions are to use her education to help the members continue to evolve and become a larger part of society. Her mother, also a BUWEA member, encouraged her to join the organization after finishing high school. She is mindful of the BUWEA founders whom she considers role models. Their accomplishments inspire her to remain in the organization as she has witnessed the respect and the way the women are treated by their husbands and the community. Roda said:

> Now that water is available, our environment is kept clean, and we are always clean. You know what? Men have changed their attitudes and realized that women can do amazing and sustainable work as or more than men, that is great. I am very proud of that. (personal communication, June 10, 2013)

Kalisa. Kalisa, a BUWEA emerging leader, is a dynamic small business entrepreneur. She sells banana beer, a variety of crops, and also raises animals. Her command of business practices has helped the larger organization understand the value of time and money. Kalisa is proud of being self-sufficient and is motivated to share her experiences and knowledge.

> BUWEA has been able to do [a] variety of things in regards to women, mostly when they have gotten a loan. They don't depend on neither their husbands nor other people to educate them on how to use the cash. They are so independent as compared to the old days. This is so because they have been educated. (personal communication, June 6, 2013)

Group profiles. The open-ended interviews at the villages allowed me to converse with groups of women who experienced the harsh reality of not living within the proximity of water. Originally, I intended to interview one village member at a time, but eight women eagerly waited for the first meeting in Kishanje. The women wanted to participate in the study and demonstrate the obstacles they faced securing water for their needs. Evocative of Hofstede's dimension of collectivism where space and privacy were shared, I adapted the data collection process to include all the members in a small room (Hofstede, 2011). Group conversations invited each

woman to speak in her own way, which included making gestures to communicate experiences, making cushions from banana leaves to demonstrate how they protected their heads, and washing their hands with a liquid from a banana stock. Every group interview at each village was distinct but similar in their individual memories of living without easy access to water.

Kishanje. Kishanje is located 40 km from Bukoba and has approximately 400 people. Kishanje was the first village engaged by the WGC and BUWEA to improve water sources in 2008. BUWEA built four rainwater harvesters of 10,000 L each with nearly 300 people benefiting directly from the construction. People from the village previously walked 2 km each way from their homes on a plateau down into the nearby valley for water. Water collection required a minimum of two hours per day and even then, the water was not enough to meet the family needs. The average 20 L of water per day per family posed a daily dilemma: "Should the water be used for cooking, washing dishes, cleaning the baby's face or the children's feet?" (Julien, personal communication, June 11, 2013).

In Kishanje, I learned the importance of flexibility when in the middle of the interview the women stopped me to visit the old water source before the weather became hotter. The group enthusiastically left the village to walk down the path to the old water source and back up to the house to finish the interview. Thorny shrubs surrounded the rocky and narrow path. The difficult terrain and effort required to navigate were notably apparent even without carrying the customary 20 L of water. The interview protocol was set aside to participate in various demonstrations, which all led to the purpose of the study.

I also learned that the women of Kishanje used to face obstacles because they belonged to the BUWEA organization. The men in the village feared their wives would neglect their daily chores—especially the chore of collecting water—to attend group meetings. Consequently, the

BUWEA leaders met with the men to explain the goal of the organization of strengthening the women, families, and communities through economic enterprises and empowering activities. Even after the men agreed to allow their wives to participate, BUWEA leaders noted that the women of Kishanje were not progressing as fast as other women from other BUWEA groups. Cross (2013) affirmed that "After some time, BUWEA staff noticed that the women of Kishanje would have to leave the member meetings early or be absent from BUWEA-sponsored workshops because they were eager to return home to collect water for their families" (p. 28). Before the rainwater harvesters were built, the village members' time for attending the meetings was limited. And when the members attended the meetings, stress and guilt over the lack of water in the home caused them to leave early. Workshop opportunities were also missed or the participants would not fully engage in the workshops because they were stressing over the lack of water.

Julien regretfully recalled the early meetings she attended where tea and yams were served: "If only I had known!" (personal communication, June 10, 2013). The little water the women had was shared in the meetings without revealing the enormous sacrifice they had to make to collect it. The process of fetching water required special preparation to avoid injuries. One of the Kishanje women described making a cushion hat out of a banana leaf to carry the 20 L jerry can on her head. She spoke of the times she would look for flat stones to place between the banana leaf cushion and the jerry can as additional protection to avoid headaches. It was a cumbersome activity that required special planning. A Kishanje villager confirmed by stating the following:

> The activity is very tiresome because it needs energy. It takes time and it needs to handle with care because if you are walking and you are not careful, you can fall down with the jerry can and then you can be hurt. (personal communication, June 4, 2013)

Kabale. Kabale is located 12km from Bukoba and has a population of approximately 300. BUWEA built one rainwater harvester with a capacity of 8,000 L on the site of the BUWEA milling station. One hundred people in the village have benefited directly, and the milling station business is a major benefactor. Service and overall productivity has improved because the miller no longer has to look for water to produce its goods for the community. The original water source, described as difficult to reach, was located on a steep hill that got muddy when it rained, and it was also used by animals. People had to walk two kilometers each way to collect water, and this was done multiple times per day. Three Kabale members described the hardships they endured before the rainwater harvesters were built:

> In the past, there were many diseases. For example, we are farmers. And we used to go to the farm, and when we come out our hands were dirty but because of the lack of water we could not wash our hands, we just wiped them and start eating. Because of this we got a lot of diseases. The illnesses were costing us money, but now that we have water we don't get sick because of dirt. The money that we used to use for treatment can be used on other things. (personal communication, June 6, 2013)

The Kabale women were eager to demonstrate their use of natural resources to solve problems. They showed me the art of securing liquid, like water, from a shaved banana tree stalk and by using *mlenda*, a leafy plant, as soap for washing their hands. Two of the elder participants recalled how their grandmother would wash their husbands' feet at night with the liquid squeezed out of the banana tree stalk in the absence of water. The younger participants found that custom humorous and were relieved that they were not expected to perform the past ritual, which was not only a way to keep clean but also a sign of respect for the men. In Kabale, I observed water streams along the roadside. Women and children collected the water, which had a rusty color appearance as far as the eye could see. Finding good water created an additional burden to the already difficult task of carrying it. At times the source would dry up, which perpetuated the time-consuming chore of water collection to locate another water source. The

new rainwater harvester made a positive economic impact in the village. The BUWEA owned milling station demonstrated increased sales as a result of having water in the proximity. The miller was able to maintain the station open and not having to shut down to search for water.

Bilongo. Bilongo is located 15 km from Bukoba and only accessible by undeveloped roads. Approximately 150 people live in Bilongo. When BUWEA built one rainwater harvester with a capacity of 10,000 L, 50 people in the village benefited directly. Three months prior to my visit, Bilongo women were carrying water from two distant sources. The women were forced to travel a longer distance to the second water source because the nearest water source had recently dried up.

When I arrived at this remote village accompanied by the gatekeeper and the translator, two gracious BUWEA members offered to give us a tour of the village. The BUWEA members showed us their crops, pigs, chickens and goats, and the rainwater harvester. Young teenage boys joined the group, listening and gesturing in approval of the conversations, mostly in their local dialect of Kihaya. The impact of having water in the community was expressed as positive. The women and young boys openly demonstrated joy as they attempted to communicate that they were responsible for cleaning and maintaining their new water tank. The group interview was held in a small brick room with hay on the floor, a wooden table, and four plastic chairs. The only decoration in the room consisted of a wooden alligator filled with flowers. Economic prosperity was not evident in this village, so no tea or yams were offered nor expected.

> The river water is very contaminated because cows drink water from there, people wash clothes from there. Even when it rains, you find that the feces get into the water, so the water is always dirty. But the rain harvesters' water they drink, their children drink. (Bilongo, personal communication, June 11, 2013)

Awareness of the dirt and contamination seemed ever present in the Bilongo women's conversation. Although the rainwater could be dirty, it was not as contaminated as the river or

stream water. Waterborne diseases were minimized as a result of the new source of water. They discussed several benefits from the new rainwater harvesters, such as improved cooking, washing, and animal care. In addition, new varieties of crops were planted in the fields where the women kept their animals.

Water team. The Water Team was composed of two founding members who received training on how to build rainwater harvesters and learned about water, sanitation, and hygiene. The team spent weeks away from their families to participate in the GWWI training in Kampala where they interacted with women from Kenya and Uganda (Women's Earth Alliance, n.d.). Once they learned how to build the rainwater harvesters, they taught the BUWEA members at the villages how to build their rainwater harvesters, with the assistance of a technician. Those village members who learned the skill remained engaged in the project to assist others in the building of additional harvesters. Every month the Water Team visited the rainwater harvesters in the villages to check the cleanliness and safety of the water tanks. Their efforts were rewarded by the improvements in the villages they witnessed during their visits. Agnes described the experience:

> Where we have built the harvesters, we have raised the woman's standard because now she won't have to use a lot of time and/or money to get water. This means that we have raised the family's standards and the whole community living near the harvester. Instead of using a lot of time to get water, they are using that time for development projects. For example, if a woman has a shop, she will get time to go and sell in her shop; if it is school, the children will get there early, the husband will go to work early or has enough water for his animals instead of wasting time to look for water for the animals.
> There are many good changes, and I am happy because if you visit the people who have water they are happy, their husbands are happy for getting water for their farms, and their children are attending school without fail. Their lives have really changed after getting water. There is a big difference now for the women who have the tanks, not only for the BUWEA members but for all the villagers because they cannot be denied water. Therefore, I think that the whole is happy to have the tanks. (personal communication, June 11, 2013)

Before and after the rainwater harvesters. The following section explores life without easy access to water, the past and present findings about how life was like before building the rainwater harvesters, and how their present life changed as a result of it.

The past. Questions about living without water evoked memories of sadness, pain, quarrels, and beatings. Living without easy access to water was terrible for the women who did not have time to engage in other productive activities. Most of the water collected fulfilled family needs, but it did not award the women enough time to start a small business, grow more crops, or raise animals. Body aches and headaches caused by lifting heavy loads kept them from being efficient. Beyond the pain and fatigue were the arguments over the use of water. Quarrels among couples would sometimes escalate into domestic violence. It appeared to be difficult for the women to speak about domestic violence or beatings. The girls and children received beatings at home and in school for being absent or late. They all felt unsafe collecting water and feared the possibility of rape or of being attacked by wild animals. A founding member described the lives of the women before water and the motivation for continuing the project.

> In the past, women were getting problems in getting water, and their lives were terrible. When we first visited them, they had water problems, and they were sad. After conducting the seminars on how to build the harvesters and how to use the water, they are happy. Some were afraid of going to fetch the water asking themselves, *Am I going to meet the thug on the way? Am I going to meet the drug addicts? I don't know how it is going to be*. Life has changed to the better. In the past, their children used to get typhoid and other illnesses but after building the harvesters, I have seen women have brightened up. In the past, they used to be sad and gloomy, but now they are happy and bright, and they can afford to laugh. (Julien, personal communication, June 10, 2013)

The dirt roads in the villages were filled with children wearing school uniforms and carrying water containers in many different sizes, colors, and shapes. Some of them carried farm tools and sweepers. Young children shared the burden of carrying water to support the needs of the family. Depending on the age and size of the child, he or she would carry a proportionate

amount. I learned that it was not unusual for a child to fall down while attempting to transport water. The child would have to return to the water source to replenish their container. This process would often make the child late at home and at school, which would cause punishment or a beating in both places. Later, I also learned many of the children performed school labor as a form of discipline for being late or misbehaving. If the child had to collect water after class, there were times when homework would suffer because there would be no time or electricity or because the child would be doing other chores. Furthermore, the water was so contaminated that it caused stomach cramps and illness. The BUWEA leader invited a first grader in Nsisha to ride with us while he was in route to collect water towards the streams. Collecting water was his duty after school. It made him very happy and proud to ride in a truck. He was carrying a yellow jerry can like many other children along the road.

Women owned the obligation of securing water for the family, a duty that affected their physical and emotional wellbeing. Securing water for cooking, bathing, and washing clothes involved physical tasks that made the women ache and feel tired. Not being able to bathe regularly made the women experience feelings of shame and sadness over the lack of hygiene. Moureen described it as follows:

> We wash our clothes at the river only on Saturdays. The only clothes that we wash at home are the undergarments, which you wash after taking your bath with your share of water. The other thing is that we can't take a bath every day. You sleep with all the dirt. (personal communication, June 7, 2013)

The present. Conserving water was a common concern among the women. The time and effort to secure the precious resource made it feel more valuable than money. Julien declared, "budgeting for water is more important than budgeting for money. The women have so many decisions to make every day on how to use water" (personal communication, June 10, 2013).

There was a general agreement that women, as caregivers of the family, could contribute in better ways than carrying water. During the interview, Pamela said:

> You can find that we women are the family caretakers. If somebody gets sick, you are the one who can take water and go and bring her tablets to swallow, so you have to use water. If you want to make the cleaning of the house, you have to use water. If you want to take care of your baby, you have to wash her, so you have to use water. So we are the ones who are very responsible for making sure that water is inside the house. So that training makes the motivation to women that, aah, if we can get those harvesters nearer so we can save more time, instead of going to the river, instead of walking to the wells, we can use this time to involve in another income-generating activity. (personal communication, June 11, 2013)

Life with water in the villages had a major impact in the lives of the family, especially the lives of the women, the girls, and the children who reported having time to perform more activities. The rainwater harvesters were viewed as gifts from God. And the improvements in the communities were visible in the form of an increased variety of crops and more animals. The women had more time to engage in economic activities, which then allowed them to spend their money on things as simple as new flip flop sandals. A greater benefit was manifested in the feelings of cleanliness and self-esteem. A Kabale participant said, "Today there is cleanliness and us women are bathing every day, children are bathing every day, and our husbands are bathing every day, even our animals are getting water every day" (personal communication, June 6, 2013). Equally important, not having to share contaminated water decreased waterborne diseases. Their improved health made a positive impact in their quality of life, their studies, and their finances.

The presence of rainwater harvesters also led to home improvements because the proximity of water made construction easier. In Kishanje, for example, it was observed that many homes or rooms were in the process of being built or expanded. There were so many construction workers breaking stones and supplies on the ground that the small village was

bursting at the seams. The BUWEA leader observed with joy that not only the members in the organization had benefited but also the community as a whole. BUWEA members who were engaged in economic activities paid other women to collect water for their family and business needs while they tended to their microenterprise. They reported saving money, but engaging the same people to help with other farm chores actually produced higher returns.

Economic, social, and environmental impact. Nearly 450 people benefited from the rainwater harvesters that were conceived, created, and implemented by following the WGC's local ownership, empowerment, and sustainability model. Building the rainwater harvesters appeared inconceivable to many BUWEA members because it was an experience that broke with tradition. Schein (2010) believed there were three levels of culture, and he defined the *basic underlying assumptions* level as "unconscious, taken-for-granted beliefs and values which determine behavior, perception, thought, and feeling" (p. 24). Similar to Schein's (2010) basic underlying assumptions, the women assumed they did not possess the capacity to build, which is a task performed traditionally by men in their culture. Pamela described the experience of making rainwater harvesters:

> I think if you can be able to see the pictures, they are very good because we are now engineers. We can be able to build from the start up to the end. Because before that I didn't know whether a woman can build, can climb the ladder to go inside to smear the tank, to mix the concrete with the cement but from that training I gained much, like I knew that even a woman can do. If you can be able to do, let's work like men. So we built that tank with the women of Kishanje. Within one week the tank was over, the harvester was over, and it was so good. It looked so nice even till now it is harvesting water. So after doing that, women were very happy, they were very amazed, and they said that we were thinking that maybe this work belongs to men. (personal communication, June 11, 2013)

The women felt proud and used the word *self-esteem* when they talked about building the new rain harvesters in their villages. The women felt empowered when they learned that they were capable of performing any type of construction work. A new way of knowing was drawn

from the old ways of knowing, in which "the concepts *experience and knowledge* have been intertwined and have overlapped to a greater or lesser extent" (Malinen, 2000, p. 134). The rainwater harvesters provided not only economic, social, and environmental benefits but also a learning opportunity that transformed the lives of the women.

Economic impact. All income-generating activities required water, whether it was to grow more crops, raise more animals, or produce more banana beer. As a result of the rainwater harvesters, women reported more time to dedicate to their income-generating activities. These activities were seen by the women as opportunities to raise their family's standard of living with unlimited possibilities for further economic growth. Adding rooms or building was the ultimate goal for some members.

> And then I found that they have constructed some of the houses. The houses I saw were not the ones I saw before because they are changing now. It seems they have some money somehow, and some of them said they are engaged in business, some selling fish, some selling bananas, some selling animals, chickens, and pigs. (Julien, personal communication, June 11, 2013)

Julien also observed the new clothes and sandals worn by the women during the village visit, including other positive outcomes:

> Before she used to wear worn out clothes, but now she will be able to buy good clothes. She will be able to keep animals because without water you cannot keep animals; therefore, they will be able to keep cattle, goats, and chicken. They will be able to build better houses. (personal communication, June 10, 2013)

Social impact. Health improvements in the villages with easier access to water enabled members and their families to live without feelings of fatigue from the long journey. Fewer illnesses, such as diarrhea, intestinal worms, and skin diseases from contaminated water, were also reported since the rainwater harvesters were built. The quantity and quality of water allowed the participants to improve their hygiene and sanitation practices as well. For example, dishes and utensils were getting washed on a regular basis, and the home was getting cleaned.

Roles and responsibilities were well defined within the group. One hundred percent of the members who were interviewed agreed that getting water was the responsibility of the women, a cultural norm that remained unchallenged. With conviction Agnes said:

> A woman has to fetch water because she cannot stop cooking. She can't stop cooking for her husband or feeding her animals. It is her responsibility as a woman to fetch water or get water somehow, that is why we are building the harvesters so as to help the women, and it is not only the women who are happy. The husbands too are happy but we target the women. . . . No one decides that a woman has to look for water just like no one decides that a man has to go out and look for money. He knows that it is his responsibility to look for money; therefore, a woman has to look for water to cook food. (personal communication, June 11, 2013)

Gender roles dictate that women, girls, and children share the obligation to secure water for household needs in this masculinity society (Hofstede, 2011). As reported by Agnes, women are the nurturers and men are the ultimate decision makers on how to use the precious element:

> I mean if the husband wants to take a bath and you have got less water, you can't stop him from dictating that he wants water. He will take it although you are the one who has been suffering to get it. But nowadays because there is plenty of water with this harvesting water, the problem has ceased. If he wants, he can take a bath. (personal communication, June 11, 2013)

Other social benefits reported were family and community relationships. The burden on children was lessened, relationships between women and their husbands became less strained, and neighbors reached out to help each other. The men did not participate in the construction of the rainwater harvesters, so the women were proud that they were the ones who built a valuable resource. A positive outcome reported by the women was that men were displaying more respect for the women by asking their opinions or thoughts on different matters.

> Now that water is available, our environment is kept clean, and we are always clean. You know what? Men have changed their attitudes and realized that women can do amazing and sustainable work as or more than men, that is great. I am very proud of that. (Roda, personal communication, June 10, 2013)

The elderly also benefited from the rainwater harvesters. For instance, there was an elderly woman who had struggled to secure water because one of the two water streams that supplied

water to her village had dried up early in the year. As a result, the elderly member and her husband struggled to collect water from the new water source that was further away. The elderly woman expressed her gratitude and enthusiasm for the new rainwater harvester, as it allowed her to use her time to grow crops for sale.

Environmental impact. Rural women seemed to be deeply in tune with the environment and their impact on it, so they had serious concerns about the environment, deforestation, and contamination. They recognized the signs of environmental stress on the water source in Bilongo, the problems that result from people going to the same water source and waiting a long time to collect water, and the importance of recycling. Bottle water, for example, was a luxury they could not afford but if available, the bottle would be reused. Manure, weed, plastic, paper, and other items were recycled as well. There was no formal system of garbage collection in the villages, therefore, trash would be recycled or burned. As Toomey (2008) argued about rural poverty, "these communities that stand to lose the most from the degradation of their local and global environment, and paradoxically, these are the communities that are also often forced to degrade their environment because of their poverty" (p. 3).

Villagers also worried about the scarcity of firewood needed for boiling water, the harmful emissions caused by burning wood, and the deforestation resulting from cutting down trees to use as firewood. They hoped to minimize contaminants and emissions. Stiglitz (2002) explained the interconnection of environmental needs and the villagers' daily dilemma for continued existence: "Poverty can lead to environmental degradation, and environmental degradation can contribute to poverty" (p. 224). Agnes observed the activities needed for daily survival and their impact on the planet:

> Water and the environment are related because if you have the harvesters then you don't destroy the environment. We went to the river in Kishanje and many other rivers and

> found that the water is contaminated because some of the people who go to fetch water there also help themselves in the rivers. But if you have a harvester, someone will get the water and use a toilet and keep the environment clean. And if you have a garden, you will water it and your children will get fresh vegetables. (personal communication, June 11, 2013)

Water contamination, of course, was the greatest concern for these rural women. And this problem is what encouraged Agnes, one of the leaders, to build rainwater harvesters. On my way to the villages, I observed that several sources of water along the road looked muddy and dirty. Many women and girls carrying their yellow jerry cans were traveling together as is the custom. There were women collecting water on the side of the roads. And the process of collecting water looked tedious as the women tried to gather water using a banana leaf as a strainer. Water collection times varied depending on human activity and sunlight. Although collecting firewood for cooking, boiling water, and keeping warm is an ongoing task that is normally assigned to men and boys, many of the women reported looking for firewood as one of their daily chores. So in addition to collecting water and firewood, women had to boil the river water because the quality of the water varied depending on human and animal activity at the source from defecating to washing, all in a small stream to be shared by the village. Judith stated, "sometimes I used to be late for work because there was usually a long queue at the river. We used to get sick because there were very many people fetching water at the river; therefore, the water was contaminated" (personal communication, June 3, 2013).

Sustainability. As a consequence of the rainwater harvesters, *what did the women seek to sustain, and what did they seek to develop?* The last set of questions led to information that collapsed the different categories into four different themes. The categories included data from member and group profiles, life before and after the rainwater harvesters, and the economic, social, and environmental impact of having rainwater harvesters. All of these categories

combined led to four themes: membership, partnerships, group projects, and empowerment. A summary of the findings is discussed in Chapter 5.

What to sustain. The women interpreted sustainability as providing growth for themselves, their neighbors, and their communities. For rural women living in remote areas without basic services, it was of great importance to have good neighbors to rely on. They have lived without water, electricity, transportation, and at times without regular meals. It was not unusual for some to exchange water for food and to help during illness and hardships. As a result, the participants deemed the value of good relationships with their neighbors and providing water from the harvester important.

> Even before we got the water tank, there was good communication among the villagers. But with water, it has become even better. When you help your neighbors with water, you are doing them a big favor because the time that they would have used to get water now they use it for other projects. You cannot deny your neighbor from getting water. (Rosemary, personal communication, June 7, 2013)

Creating a legacy that could be passed on to future generations generated a dialogue that revealed sustainability was at the heart of decisions, actions, and behaviors. Participants felt it was important to have positive interactions with members, good leadership to support the organization, and good partners within the community. The women have learned the value of screening for good partners to sustain BUWEA. They expressed that committed partners are the key to continue the growth of BUWEA. For this reason, passing the skills and knowledge they have acquired to the next generation is indispensable.

> Why are women joining BUWEA? They are joining BUWEA to ensure that something that we started has continuity and does not break. They are joining BUWEA because they want to make sure something that we started does not stop. They are joining because they have seen how the first members who joined BUWEA have developed, they have seen many women get projects, many women have become self-dependent. This is why many women are willing to join our groups. (Kalisa, personal communication, June 6, 2013)

> For me it is of great importance to be in the group because in a group there is different ideas and education where members teach each other on how you can come up with [a] new project or how you can expand existing projects. If you are alone, you can never secure a loan because you are not part of the group. We have managed to get different business and markets that we create amongst us, that is why many people want to join BUWEA. (Judith, personal communication, June 3, 2013)

To this day, becoming a BUWEA member requires engaging in an economic activity. New members receive an animal or some resource to help them start a small business. Additional benefits are the use of the learning center, the kiosk, the computers, the savings and credit fund, and each other as a network for social and economic contacts. The importance of projects to fuel their economy and provide problem-solving strategies in matters of family and community motivate the women to explore additional opportunities. Therefore, the value of finding good members to join the BUWEA community groups was considered critical for its continuity. Moureen further reinforced this idea when she discussed the importance of selecting good members to be part of the organization.

> We don't allow someone to join the group as an individual. We take those fine individuals who are focused and committed, who are in good terms and relationship to one another, and you have a project in mind. Not us to come up with a project for you. (personal communication, June 7, 2013)

Kishanje, the first group to build the first four rainwater harvesters, expressed a deep sense of responsibility to maintain them. When the group was asked, who is responsible for the upkeep and sustainability of the tanks? The group unanimously responded, "It's ours."

> Our duty is to ensure that the harvesters are well secured from vandalism, theft, and all the negative things that will affect the tanks. We do not take for granted that we have these harvesters; therefore, when a need arise, we come together. The neighbors who uses the water too and the entire family where the harvester is then we put heads together and come up with positive solution for the need at hand, whether cleaning or repair in general. (Kishanje, personal communication, June 4, 2013)

A strong desire to help others in the community after building their own rainwater harvester motivated this BUWEA member. Rosemary interpreted sustainability as providing growth for the neighbors and villages.

> If it were possible, we would have helped others to get water harvesters because water is very important. Women walk long distances to get water and when you go to the village, you find that people waste a lot of time to fetch water. They would have used that time to do other things. In my opinion, we should maintain the water harvest project, and God willing we will strengthen BUWEA to help others get the water harvesters because we are many. (personal communication, June 10, 2013)

Additional comments were related to why other groups have not been sustainable.

> Most of them they have a consumer mentality, they look this project with a money perspective. They just want the eureka moment, but when they have served like twice and see no immediate fruits or their aim not achieved is when they step back and give up. (Moureen, personal communication, June 7, 2013)

Sustainable development seeks to create a just society that promotes economic growth, social development, and environmental protection for all people. The concept of sustainable development is deeply grounded in the belief that inequities of the poor in the present generation should not be a legacy to pass on to future generations (Kates et al., 2005; Stoner & Wankel, 2008). With this in mind, mother and daughter members have enhanced the sustainability of BUWEA projects further. I was granted a glimpse into the culture and the process of sustainability when I learned about the following example. A BUWEA village member and one of the builders of the first rainwater harvester passed away two-weeks before my visit. The group went to the gravesite to pay respects to the deceased member who was buried several feet away from the house. The burial site was beautifully decorated with wreaths, flowers, and candles. The grieving daughter, also a BUWEA member, became responsible for maintaining the rainwater harvester and continuing her mother's legacy to provide water for her family and neighbors thus ensuring the sustainability of the water source.

What to develop. BUWEA members appreciated their external partners for providing skills and knowledge during workshops. Hence, BUWEA members stressed the need to recruit local university graduates committed to helping rural women with the same respect as someone in the same social class. In addition, the original members shared their concerns about succession plans to maintain the mission and culture of BUWEA. Julien observed the following:

> We also need educated members, no matter how many. We can have [a] few, but we need at least to have educated members on high levels because then after I am gone. I can't say I am educated so much, but I have experience. But we need someone who has gone to university, one or two who are prepared to help with grassroots women and maybe in the beginning from our projects. We can't have very much money to pay them but the support that they can. Because they are educated, they would like to be paid and then plan their future . . . BUWEA . . . we feel like, it will be a shame on us to let it go while we have started. . . . And you have to consider the women you are working with, not learned so as you come and go down there the thing that is very amazing. I will always say this thing has come from God, of course not a human being, because to have someone who can work with uneducated women, grassroots women and think that they are equal, you find them as if you are equal. So that is the challenge, but I think God will help one day that we have people who would like to work with poor grassroots women and work together. (personal communication, June 10, 2013)

Judith felt that growth, partnerships, and good will in the community were the result of many good leaders. So in order for BUWEA to remain successful, future BUWEA leaders would have to have good leadership skills.

> The leaders should have a loving heart. They should have no pride of seeing the members can handle things by their own. They need to involve the rest of the members in all they do. I think the first thing is good leadership. If you are a leader and you are doing things that are not good, then the members will be discouraged with continuing. I think leadership helps with growth and openness of a project. (Judith, personal communication, June 3, 2013)

Because there are currently no other prospects of improved sources of water from government institutions or development agencies, BUWEA members recognize the need to continue to build rainwater harvesters for their families and neighbors.

> We have plans and dream of getting more tanks so as at least every home will have its own tank. That is to mean we need help to get more tanks to ensure water is not a scarcity to us in whole. (Kishanje, personal communication, June 4, 2013)

Rosemary added, "If it were possible we would have helped others to get water harvesters because water is very important" (personal communication, June 7, 2013).

BUWEA members also recognized the importance of donor partnerships. Several women, in fact, felt a deep appreciation for a WGC volunteer who was a force behind the clean water project since 2008. Their endeared Mama Maji (meaning water mom) was appreciated for her support and perseverance in helping BUWEA find the right solution for collecting water. BUWEA embraced the three foundations of the WGC's empowerment model. The foundational principles of local ownership, sustainability, and empowerment served as a guide to fuel its internal growth. Julien described the importance of good partners and outside donors.

> We worked very hard before WGC and nothing happened . . . now look where we are! We cannot forget the support from WGC because they always ask. Without them, we were suffering because of going to the river. We had headaches, foot aches because of going to fetch water, which we are not doing now. (personal communication, June 10, 2013)

BUWEA's motivation, as expressed by the founders, is deeply rooted in their relationship with their partners. Ongoing communication and annual visits nurture the relationship with their first partner. The WGC and BUWEA built a partnership strengthened by open and inclusive communication documented in the cross-cultural dialogues in the WGC website. The mission of the WGC is "to promote the learning and leadership capacity of women locally and globally, particularly in the least advantaged regions and countries" (WGC, n.d.a). Sseruwagi (2012) described the decade-long relationship between the two organizations: "the participants looked upon the external stakeholders as their sisters, although they were separated by diverse cultures, geography, background, and race" (p. 85). Rural women were invited to attend workshops in

marketing, leadership, business, and communication skills by WGC volunteers and UIW doctorate students and professors, an opportunity not customarily available to rural women.

In partnership with the GWWI, a program of the Women's Earth Alliance, BUWEA learned water, sanitation, and hygiene (WASH) strategies. The GWWI and local women leaders designed training sessions for grassroots women to bring sustainable WASH solutions that improve their communities' health and self-reliance. (Women's Earth Alliance, n.d.). After exploring different alternatives to solve the issue of water, BUWEA, the WGC, and the GWWI joined forces to change the lives of hundreds of people. Pamela reflected:

> The knowledge which we got from those trainings in Kampala has a big impact to BUWEA members also to the community because you can see that now women are able to save their time. Instead of walking far away to rivers or to wells to get some water, now they can save their time and use that time to engage in other economic development activities. And also about children because children or girls have the activity of fetching water from rivers, so by now they are very easy to attend to school, there performance has raised because now they are attending fully. Instead of going using their time to fetch water, now they are using their full time to study. Also the village or the community as a whole they are now getting quality water, so the illness is reduced. And also to BUWEA, we are looking another impact to BUWEA that the machine now we are grinding the high quality products like soy, they are washed, they are soaked and also the place is clean as you saw. So we have much customers because if they make . . . like cassava . . . or maize . . . they find that there is no sand or other particles which are interacted with our products. So our customers now have encouraged with our quality and as a result our sale has raised. (personal communication, June 6, 2012)

BUWEA has also formed significant partnerships with other nonprofits to finance various projects. The support of outside organizations helped members gain knowledge, access microloans, and create income-generating projects. Each project was assessed in its own merits as the organization gained knowledge and expertise. Long-term relationships with the same donors have allowed BUWEA to gain knowledge and strength.

> They give us many different seminars, and this makes us sustainable. They also give us different forms of aid, for example the factory, the animals that they give us, these make us sustainable. Therefore, the different kinds of aid that they give help BUWEA to be sustainable. (Bilongo, personal communication, June 6, 2012)

The local and federal governments were not able to provide financial support for any of the villages where the members' reside at the time of the study. Yet, BUWEA has been in consultation with local government officials about the water project during every step. As a result, BUWEA has a good relationship with local authorities. The local authorities, in turn, have cooperated with the group and supported their efforts. As Georgina said, "of course they are giving us encouragement, of course not financially but encouragement, keep it up, keep it up. You know that word can make you strong" (personal communication, June 4, 2013).

Members spoke of the importance of developing individual and group projects as a pathway to eradicate their poverty. The milling station, a processing facility for soy and maize, employs three people full-time and serves the community of Kabale. Village members used to have to carry their crops into Bukoba on bicycles or pay for other transportation. The milling station provides a service that is locally needed and BUWEA has an income-generating business. The learning center is a place where women can sew, cultivate their mind, and think of ways to expand their home-based businesses. And the kiosk provides space to sell their products. Feelings of empowerment as a result of the group membership, relationships with partners, and group projects emerged during conversations of what to sustain and what to develop.

> Being a BUWEA member has helped me a lot because I know how to start the construction of the rain harvester, even my husband does not know. People in the village see BUWEA members as models because now they are having things that others do not have. (Bilongo, personal communication, June 11, 2013)

Summary

The findings of the study revealed the hardships of living without easy access to water. The rural women of the Kagera region spoke of the countless hours spent trekking through harsh terrain in search of water, at times fearing for their safety, while enduring fatigue, illness,

punishment, and having to deal with contaminated water. They reported improvements in every dimension of sustainable development as a result of the rainwater harvesters. Moreover, their reflections provided their own framework and understanding of sustainable development based on four themes: membership, partnerships, group projects, and empowerment. These four themes represent the findings of the study that sought to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water.

This chapter provided a panoramic view of the perceptions and experiences of sustainable development as a result of an improved access to water by interlocking and assembling data like pieces of a puzzle to compose one small picture of the participants' understandings. The findings offered a broader view of sustainable development and water issues and the role of the BUWEA as a strong organization that is focused on working as a group and on its mission to empower women through educational and economic development projects.

In short, members expressed their desire to sustain the BUWEA organization. As expressed by Yulitha, "workshops that we get will make the group sustainable. Donations like the soy plant will then help us produce and then make the group strong" (personal communication, June 12, 2013). Additional findings involved working in a collectivist culture where adaptable behaviors resulted in a deeper exchange of learning.

Chapter 5: Discussion, Conclusion, and Recommendations

This chapter discusses the major themes that emerged from the participants' perspectives and experiences as interpreted by me. The purpose of this case study was to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water. The study included data from individual and group interviews, field notes, observations, and BUWEA documents that investigated the economic, social, and environmental impact of a new water source on the lives of rural women living in the Kagera region. The following central questions of the study sought to explore the local meanings of sustainable development and improved water sources.

1. How was life of rural women from the Kagera region in Tanzania before the rainwater harvester project, and how did it change as a result of it?
2. How did the rural women from the Kagera region in Tanzania perceive and experience the economic, social, and environmental impact as a result of easier access to water?
3. As a consequence of the rainwater harvester project, what did they seek to sustain, and what did they seek to develop?

The participants of the study were members of BUWEA, a grassroots organization that seeks to eradicate poverty by empowering women. BUWEA aims to strengthen the leadership skills of its members and to develop their capacities with small business enterprises. By forming small economic groups, the members pursued opportunities to promote the education of women on basic business skills, technology, health, and other issues. The participants were all women of BUWEA living in the Kagera region who have been involved with a new water project. The women mobilized through training and support from NGOs, the WGC, and the GWWI, to build rainwater harvesters in marginalized villages where some members reside.

I used a case study method drawing from a qualitative paradigm to illuminate the local perceptions and experiences of the BUWEA women. The 23 participants of the study were involved in the rainwater harvester project that built eight harvesters in four villages in the Kagera region. The case study allowed me to rely on previous "theoretical propositions to guide the data collection . . . and the analysis and to investigate a case in depth and within a real-world context" (Yin, 2013, pp. 16–17).

Theoretical Framework and Discussion

The data collection and analysis were guided by two theoretical concepts: Sen's (1999) capability approach and Parris and Kates' (2003) taxonomy of sustainable development goals. The capability approach guides human development studies beyond economic metrics to include social and gender justice. Sen (1999) argued that development as freedom "requires the removal of major sources of *unfreedom*: poverty as well as tyranny, poor economic opportunities as well as systematic social deprivation" (p. 3). The rainwater harvesters removed a major source of deprivation to become a resource. The women were able to convert this resource into valuable *functionings,* defined as a set of valuable *beings and doings,* which translate into better health and improved economic status. The women's capability set was expanded as a result of the functioning (s), less fatigue and illnesses and more time to dedicate to economic activities in order to live a life they have reason to value.

The study found that adverse conditions associated with water collection oppressed the participants and kept them from "achieving the kind of lives they have reason to value" (Sen, 1999). The study concluded that the women of BUWEA were aware of environmental issues, but poverty and marginalization kept them from discontinuing old customary practices of using firewood for boiling water. For example, I learned that BUWEA women understand issues of

water and sustainability. Their strength as a group, their partnerships, and projects bring a bottom-up approach to engage in the global dialogue on major policy and program decisions, such as the SDGs. Administrators and policymakers should consider working with rural women to set strategy and tactical goals in a collaborative manner, one which promotes genuine dialogue and creates real change. Although development initiatives target rural women, such as BUWEA women, there are still approximately 300 BUWEA members living without easy access to water.

Summary of Findings and Connections to Existing Knowledge

In qualitative research, data analysis is the process of "bringing order, structure and meaning to a mass of collected data" (Marshall & Rossman, 1995, p. 111). This research study followed Phillibber, Schwab, and Samsloss' (1980) "blueprint on what questions to ask, what data are relevant, what data to collect, and how to analyze the results" (p. 26). Figure 12 shows the process of collecting data and the study's identifying themes.

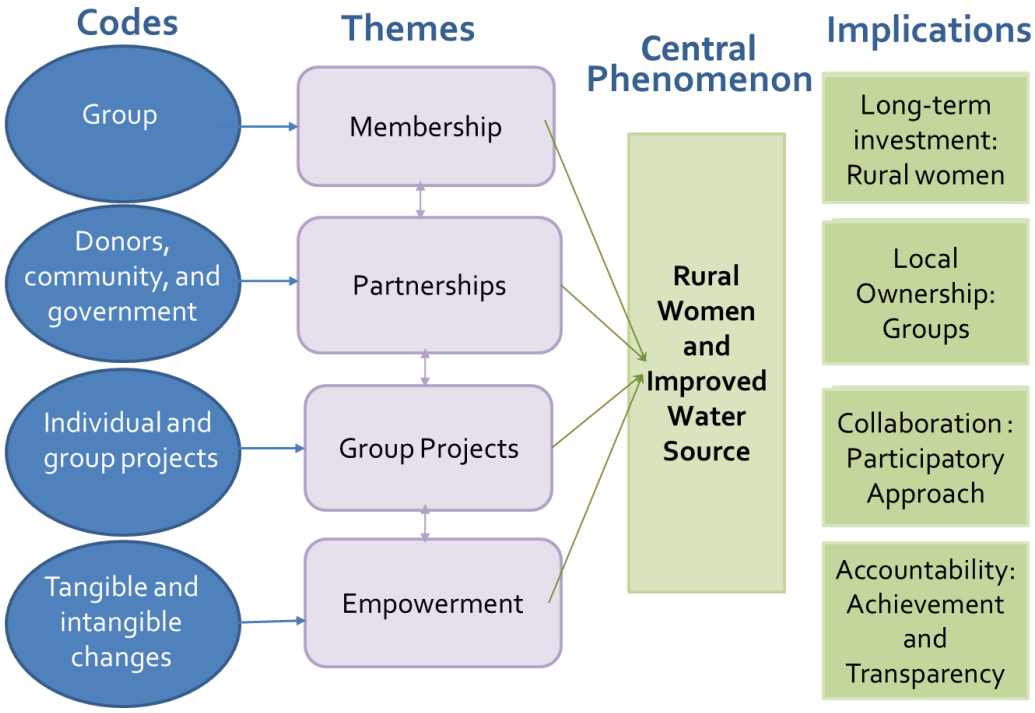

Figure 12. The process of collecting data and identifying themes.

Adverse Conditions Associated With Water Collection

The inquiry on how the women experienced sustainable development as a result of their improved access to water offered a rich dialogue and deep reflection into their past experiences without easy access to water. Similar to Yohannes' (2008) findings, I learned that the proportion of rural people having access to water in the research sites were a small percentage, if any. The time involved in water collection prevented children from attending school, especially girls, and women from engaging in other productive activities. All of the participants agreed, though, that women and children were responsible for collecting water in their culture. As Nussman and Glover (1995) asserted, customs dictated roles and responsibilities of women, which oftentimes were the cause of their pain. Roda, a younger participant of the study, best narrated the dreadful water responsibility and effects on a child:

> Oh! That was so sad. When I was young, I used to walk long distance in the valley to collect water for the family. I had a very tight schedule during those days; before going to school, I had to fetch water. I sometimes fell down because the path was very steep and muddy when wet, and I used to go to school very late, and the teachers could beat me almost every day; they did not want any explanation. As time went on, I used to save time by carrying one jerry jar of 10 L on the head and the other one on my hands. It was very difficult for me walking along the forest, but we had to walk as a group otherwise you are in trouble, used to get sick more often, sometimes became exhausted because of other activities that I had to do, such as working on the farm. You know what? On my way from fetching water, I had to stop two to three times to rest. I even had to fetch water in the evening. When I'm back from school just imagine how tired! I was a sad girl, sometimes cried. Lack of safe water created a tremendous burden for me of diarrhea. (personal communication, June 10, 2013)

The inequalities between men and women in water resource management and consumption influence women's life choices, which is at the heart of Sen's (1999) capability approach.

The study revealed the intense suffering that women and children endured because they did not have easy access to water. As Smith and Thurman (2007) observed, "poverty is not exclusively a financial problem" (p. 111). Women quarreled with their husbands over the use of

or the lack of water. Women and girls feared animal attacks or rape on the way to the streams. And just like previous studies led by the UN, WHO, and other institutions, an array of illnesses, such as diarrhea, worms, dysentery, and skin diseases, kept the children from attending school. Moreover, punishment of children in the form of beatings at home and at school for tardiness from water collection was reported as common. Participants also reported making long trips to collect water only to find the water dirty and contaminated. Worse yet, participants would sometimes find that their water source had dried up. In addition, participants felt deep psychological feelings of shame from lack of sanitation and hygiene. My in-depth analysis into the difficulty of accessing water identified seven adverse conditions: time, fatigue, illness, punishment, quarrels, safety, and contamination (see Figure 13). These conditions represent a painful story for every woman that participated in the research study.

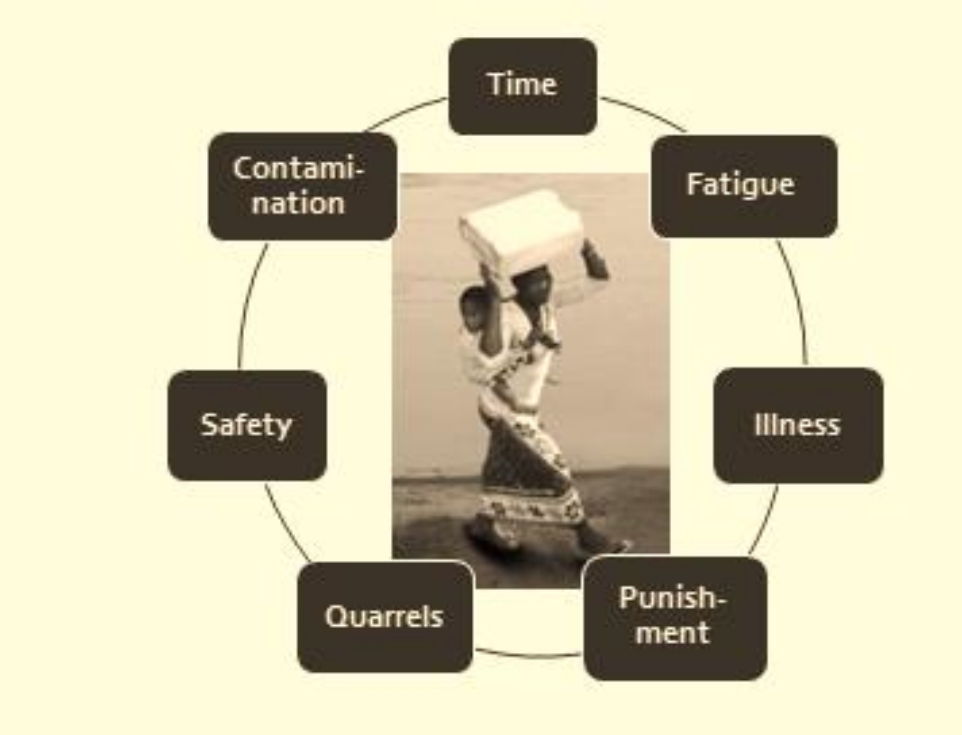

Figure 13. Adverse conditions associated with water collection.

Time. Nkuba (2007) stated, "women managing their precious time" (p. 186). Like Nkuba, I learned that women deal with multiple priorities. They nurture their families, grow crops, raise animals, and collect firewood, in addition to carrying water and other chores. The frustration of their lost opportunity to engage in other productive activities was captured in their interviews.

Fatigue. Collecting water is an exhausting routine that requires physical efforts; the participants sometimes made two or three trips per day. Productivity suffered in every aspect of their lives from crop cultivation, animal care, and business activities.

Illness. Worms, skin diseases, and diarrhea were some of the illnesses that the entire family endured. The children, especially, were affected because these illnesses prevented them from attending school and living a healthy life.

Punishment. Beatings at home and at school for being late as a result of collecting water were shared memories and realities of many participants. As a culture, corporal punishment is the norm, but participants still reflected on their suffering.

Quarrels. The lack of access to water affected the quality of domestic life. The women were responsible for managing the use of water, which was carefully budgeted to meet the family needs down to the last liter. But, men had the ultimate say on how the water was used. It created family disturbances, which sometimes would escalate into domestic violence.

Safety. Having to make the water journey in the early or late hours of the day created anxiety of animal attacks or, worse yet, rape.

Contamination. Contaminated water sources, deforestation, and firewood consumption were shared concerns by the women. The women were aware of the efforts to conserve the

environment. Their lifestyle promoted conservation of the environment with expertise in recycling water, manure, and trash.

Themes

Another finding provided insight into how the rural women perceived the sustainability of the rainwater harvesters, providing the women's views of sustainability at a higher level. Four themes emerged from an in-depth analysis of the interviews, observations, field journals, and documents pertaining to the BUWEA organization and the water project: (a) membership, (b) partnerships, (c) group projects, and (d) empowerment.

Membership. Membership growth was due to the founding members' insight of recruiting close-knit groups who shared their vision of empowerment through income-generating projects. As Caffer (2006) observed, the women's previous experiences with small projects as members of the group facilitated their development. Unlike other community livelihoods in Tanzania that only promote care and social programs with economic growth (Masaiganah, 2010), BUWEA's small group projects have evolved into other bigger projects, such as building the rainwater harvesters and the soy manufacturing plant. The women attributed their sustainability to working together and letting the group grow organically with the right members sharing the BUWEA vision. In the context of membership, the women identified attributes for the continuity and growth of the water project and the BUWEA organization. The five attributes within membership were groups, selection, collaboration, relationships, and learning.

Groups. Beyond the BUWEA organization, the women had created an informal support system and had found strength in their membership team. Women helped members during birth, death, and family problems. They cooked and collected water for members after the delivery of their babies when needed. Living in remote villages at times created feelings of isolation, which

were minimized by a sense of belonging and support during hard times. Beyond groups support, there were business opportunities within the different villages. I witnessed the commercial exchange among the members.

Selection. The women screened potential candidates for membership in BUWEA both as individuals and as small groups who aspired to become part of the larger group. BUWEA looked for groups that were already established because they believed that these established groups trusted each other, could vouch for each other's integrity and work ethic, and held each other accountable. Membership in BUWEA was seen as a major force to select the rainwater harvester sites for sustainability. Many participants stressed the importance of having good members, carefully selecting new members, and encouraging collaboration and support for each other.

Collaboration. Members believed in the importance of sustaining peaceful relationships that foster growth for the whole. Collaboration was the key to maintaining the rainwater harvesters clean and in good working condition, allowing the group to benefit. As Kalisa observed, "cooperation is the thing that contributes to a group growing, meeting, talking together. We give different views and agree on what to do" (personal communication, June 6, 2013).

Relationships. Good members contributed to the whole by being responsible and supportive of other members. Importance of maintaining good relationships and support was evident in the comments from a BUWEA member who helped built rainwater harvesters even when there were no immediate plans to build one in her village. The trusting relationships from members manifested into many forms: encouragement, help with microloans, being good neighbors, and many other demonstrations of community.

***Learning*.** The participants expressed a hunger for knowledge and a strong desire to learn. They did not just want to learn how to build water tanks; they also wanted to learn agricultural practices, technology, business skills, and life skills. Education was seen as a vehicle to move out of poverty (Walker & Unterhalter, 2007). Agnes expressed the following:

> In my opinion, I see that the education we got has helped us to uplift our families, and the families have also benefited by getting water. Therefore, the children can study without problems, and women can do other beneficial projects and get some money. Those who are in business can do their businesses and those who are in farming can do their farming. Women have gained so much because of not having water, having suffered for a very long time fetching water from the river. (personal communication, June 3, 2013)

Partnerships. Seven years of struggle and despair, rewarded with small gains, marked the beginning of BUWEA. Then, in 2003 BUWEA leaders met with the WGC co-founder for the first time to explore potential collaborations. Julien exclaimed, "We worked very hard before WGC and nothing happened . . . now look where we are!" (personal communication, June 10, 2013). The participants recognized the importance of donor relations in order to build easier access to water and provide training workshops for the women's own development. The following statement was echoed in the meetings:

> We have plans and dream of getting more tanks so as at least every home will have its own tank. That is to mean we need help to get more tanks to ensure water is not a scarcity to us in whole. (Kishanje, personal communication, June 4, 2013)

In addition, there was a feeling of kinship and unwavering support from outside donors and their local government officials. Some members reported feeling motivated by outside donors, which encouraged them to remain engaged.

Group projects. A holistic view of the members' welfare played an important role in the development initiatives of BUWEA. Each project, such as the clean water project, in its own merit evolved over time with internal and external support. Members divided project responsibilities from the soy cultivation and manufacturing program to the milling station. With

the help from grants, the members managed the income-generating activities and social programs under the assumption that the projects would eventually become sustainable.

Empowerment. Some of the members of BUWEA reported feeling empowered as a result of the water project and by being part of the group. Building the rainwater harvesters appeared inconceivable to many BUWEA members because it broke with tradition. The women assumed they did not possess the capacity to build like men. Well-defined roles kept Pamela from thinking she could mix cement, make bricks, and construct the rainwater harvesters. Pamela described the experience:

> If you can be able to see the pictures, they are very good because we are now engineers. We can be able to build from the start up to the end. Because before that I didn't know whether a woman can build, can climb the ladder to go inside to smear the tank, to mix the concrete with the cement but from that training I gained much, like I knew that even a woman can do. If you can be able to do, let's work like men. So we built that tank with the women of Kishanje. Within one week the tank was over, the harvester was over, and it was so good. It looked so nice even till now it is harvesting water. So after doing that, women were very happy, they were very amazed, and they said that we were thinking that maybe this work belongs to men. Hence, they were thinking but because we women we were laborers, we were the ones who built that tank, so we found that by using those women who were suffering that problem so you can be able to build more tanks. You can be able to solve some problems, and maybe you can ask why women not men. Okay, some men contributed something, but we women are the ones who know the family problems from our homes. (personal communication, June 11, 2013)

Findings support initiatives to invest in rural women through education, collaborative interventions, and long-term plans for targeted outcomes and sustainable change. Beyond the pseudo participation to genuine community participatory approaches as presented by Deshler and Sock (1985), these women understand sustainable development as an action constructed under their own framework with outside support. The BUWEA women's model entails strong membership, supported partnerships, meaningful group projects, and ultimate feelings of empowerment, all leading to the expansion of their capabilities and enhancement of freedom to make life choices.

Implications

The Rio+20 agenda encourages participation of all stakeholders in the formation of the SDGs. It implies that governments, institutions, and development agencies should consider engaging and soliciting the voices of rural women, such as the members of BUWEA, in the dialogue of sustainable development and the SDGs.

Rural women. Long-term investments in the education of rural women are not normally made. Many capacity-building efforts target youth and children from either external stakeholders or local trainers. As Yulitha expressed about her local educators, "they never, never, never spend time with us" (personal communication, June 12, 2013). The rural women of BUWEA expressed the desire for additional knowledge, and they credited BUWEA and its partners for giving them the tools to improve and prosper. The BUWEA women articulated the value of investing long-term in their capacity and projects to become empowered. It was increasingly clear that "woman's voices and experiences must be heard" (Ettling & Gonzalez, 2011, p. 1) because women tend to invest in their families, thereby improving their communities.

Local ownership. Outside stakeholders will benefit from working with local groups and learning about the community's issues through open dialogue. Engaging in such partnerships will help to find solutions or alternatives in the context of the community's culture. It will open an opportunity for local groups to own, lead, and sustain development projects and environmental initiatives. Another advantage of working with established groups and letting them grow organically is that these groups may have natural leaders who have earned a level of trust within the group

Collaboration. The benefits of working in partnerships and appreciating the different ways of knowing and learning provide the basis for constructive collaborations. There should be

a mindset of equal partners to create sustainable solutions. Openness to examine root causes of marginalization and other social and economic barriers must include cultural ways of relating. Mertens (2009) wrote about groups in which "knowledge was disseminated to the rest of the community through songs, plays, poems, dance, theater, and storytelling" (p. 139). BUWEA women joined in prayer, dance, and singing in addition to partnerships and projects.

Accountability. Mutual commitment to achieving results in projects, education, or other endeavors should build an expectation of trust and transparency between local groups and interventions. Unlike the "dig-install-depart" model described by Huby and Stevenson (2003, p. 196), sustainability of programs requires a higher level of commitment from outside stakeholders. NGOs, agencies, and other institutions should consider local ways of documenting results without overwhelming rural people with complex methods of reporting.

Conclusion

Institutions, policymakers, and NGOs should consider supporting local initiatives with groups that have been established either formally or informally. The women reported that the selection of key members was critical for its continuity. Women want to participate in their own development and work in partnership with outside stakeholders. Well-meaning doctors and outside agencies have attempted to educate the rural women on how to minimize illnesses, but their choices are limited by the only sources of water available. As Pamela expressed during an interview, they know water makes them sick when it is collected from a contaminated water source.

Working in a respectful, collaborative manner with mutual agreement on results help the women remain engaged and feel valued. A long-term commitment should be a strategy to secure commitment from internal and external stakeholders to pursue sustainability. A major conclusion

of this study was that change in the Kagera region is more likely to be effective when the women are allowed to create their own model of sustainable development. Another contribution involved the gaps identified in the literature, which have been bridged with the findings of this study.

This study gave marginalized women a voice to discuss their experiences with the lack of easy access to water. In addition, the women illustrated four connections into how sustainable development builds in their local context. The women reflectively expressed that education was a critical vehicle to attain empowerment and reject marginalization. Sseruwagi (2012) concluded that "the rural poor are increasingly involved in the process of developing themselves at the various stages of development and capabilities are increased that enable them to own and manage their destinies in collaboration with external stakeholders" (p. 84). The BUWEA women found the development of capabilities to be critical in development initiatives. Business and computer skills, animal husbandry information, and all pertinent knowledge that the rural women received from external partners were mentioned in the interviews as being the catalysts to promote growth, decision-making, and feelings of empowerment.

Furthermore, the study revealed the women's hardships of living without easy access to water and its limiting choices or *unfreedoms* as discussed in Sen's (1999) capability approach. The women suffered from fatigue beyond the physical state of worrying, budgeting, and quarreling with their husbands over its use. Water was not a problem in isolation, lack of sanitation and hygiene created deep feelings of shame from personal and physiological needs. Prefacing the polite and general answers to the water situation, early responses glazed over the deeper and more difficult circumstances of the women. Brooks (2000) declared, "the intimate sharing of stories, usually with other women in a safe context, is a time-honored way in which many women have first claimed their own voices" (p. 152). Probing questions, accompanied

with periods of silence led to the sharing of deeper emotions and experiences of painful memories. Children robbed of precious playtime, girls unable to attend school, and women stressing over water represent some of the unjust consequences of not living in proximity to water sources.

Under the same perspective, this study described rural women's perceptions and experiences of sustainable development as a result of their improved access to water. Currently, BUWEA women are undertaking social and economic projects aimed at creating better living conditions for empowerment and sustainability as well as building improved water sources for villages that are in dire need of easier access to water.

Despite several empowering projects and efforts, the BUWEA women struggle with poor infrastructure, lack of transportation, minimal access to clean water, and an array of socioeconomic problems, which resonate with the literature of women working up to 18 hours per day to provide for their families. Despair was replaced by empowering feelings after receiving training to build the rainwater harvesters. Breaking the cultural barrier that limited women choices to build, like men do, allowed the members to construct a different paradigm.

The study offered a model of sustainable development based on four themes as the women of BUWEA perceived and experienced it: membership, partnerships, group projects, and empowerment. The BUWEA model of sustainable development emerged from the analysis, findings, and reflections to give a graphic representation of the women's perceptions and experiences of sustainable development as a result of their improved access to water (see Figure 14). The model is applicable to the water project but may include the other projects, such as the soy manufacturing plant, the milling station, and microlending. Each theme, in the context of the water project, is defined as follows: (a) membership entails the commitment of members to

attend training, to build, and to maintain the rainwater harvesters; (b) partnerships means that members recognize the importance of donors who are funding the water program beyond financial support; (c) group projects involve WASH, construction, and maintenance of the water program, including the rainwater harvesters; and (d) empowerment relates to all the positive economic, social, and environmental benefits as a result of the new source of water, which include feelings of satisfaction, the freedom to choose, and being respected. Similarly, the model views the BUWEA organization as one that is strengthened by its members, outside donors, and projects. The BUWEA organization and its partners, in turn, empower women.

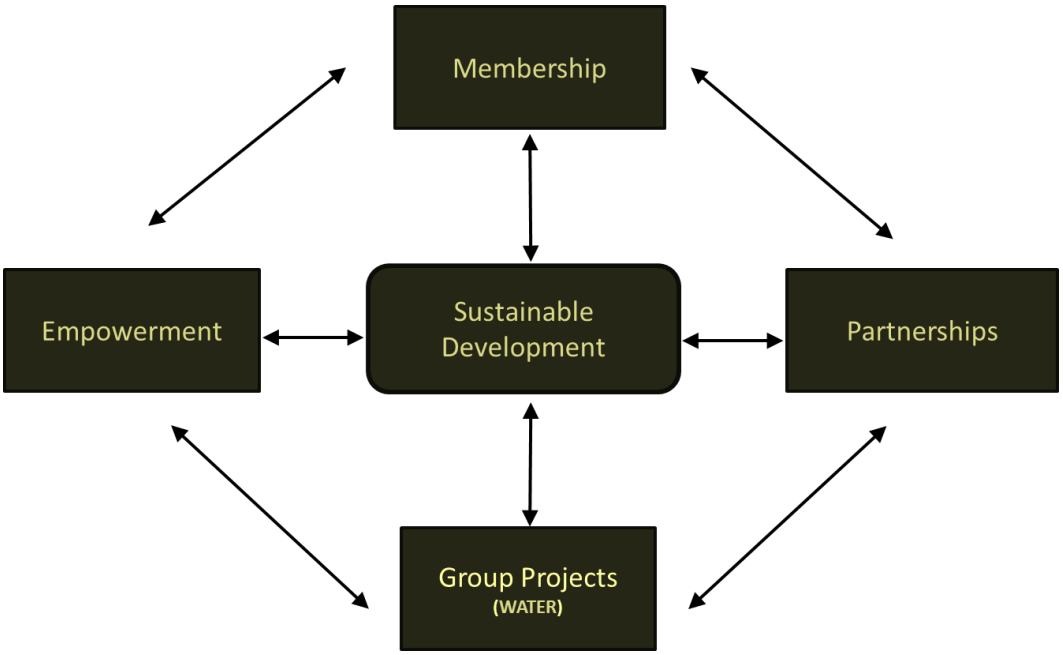

Figure 14. BUWEA's model of sustainable development.

I was sensitive to the culture, norms, values, and traditions of the research setting and considered it to be equally important as sharing information and encouraging openness. I also learned to be flexible during the interview process to allow richer information to be collected. The openness of the BUWEA women illuminated the dialogue on water issues and sustainable development. In short, living without easy access to water was terrible. I heard about the

hardships of collecting water in previous trips. I was invited to see for myself and to walk the pathway to collect water down the hill in the village of Kishanje. It was a process that took one hour and 25 minutes. It was hot; there were brush, rocks, and insects. I endured the journey without lifting the water jug. Hearing and seeing was very different than doing. After the physical impact of traveling down their path I understood the enormity of their suffering.

> I hear and I forget—I see and I remember—I do and I understand
> (Confucius, 479 B.C.)

Recommendations for Future Research

Recommendations for future research based on the topic of water and rural women are the following:

1. A longitudinal study may be conducted to learn more about how easier access to water has impacted the communities involving men, women, and children.
2. A longitudinal study of the BUWEA organization and its sustainability may be conducted to provide further insights and valuable information.
3. Denzin and Lincoln (2005) proposed ethnographic, phenomenology, and life histories for case studies. Using one of those approaches, future research may examine additional issues related to water, such as the lack of sanitation and hygiene facilities, sanitation and health, and the impact of water collection on education.
4. Similar studies could be replicated in other developing countries engaged in water initiatives to add to the understanding of water, sanitation, and sustainable development.
5. A comparative case study of the Water, Sanitation and Hygiene (WASH) project by the GWWI can compare the outcomes of the training and improved water sources in Kenya, Uganda, and Tanzania.

6. Aligned with sustainable development goals, additional explorations of the social, economic, and environmental issues could reveal findings that would aid development initiatives. A post 2015 agenda contemplates the SDGs to be published before the year 2015. The research paradigm may be dependent upon the goals, the metrics, and the variables identified for water and rural women.

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Appendix A

Application for Institutional Review Board Approval Form
University of the Incarnate Word

Title of Study: Sustainable Development and the Issue of Water in the Kagera Region of Tanzania

College/School or Division/Discipline: Ph.D. Organizational Leadership School of Graduate Studies

Investigators			
Principal Investigator - A UIW PI must be designated for all projects in which UIW is engaged in research.			
Name: Teresa M. Dresner, Ph.D.C	Phone #: [redacted]	E-mail: Tdresne1@student.uiwtx.edu	Address: [redacted]
Co-Investigator(s) – List all co-investigators and provide contact information on each one			
Name:	Phone #:	E-mail:	Address: same
Faculty Supervisor of Project, Thesis, or Dissertation			
Name: Absael Antelo Ph.D.	Phone #: [redacted]	E-mail: antelo@uiwtx.edu	Address: UIW – GB 230

Appendix A (*continued*)

Research Information		
Research Category: ☐Exempt X Expedited Review ☐Full Board Review		
Purpose of Study: The purpose of this case study was to understand how a group of rural women from the Kagera region in Tanzania perceived and experienced sustainable development as a result of their improved access to water.		
Number of Subjects: 350	Number of Controls: Click here to enter text.	Duration of Study: One Year

Does this research involve any of the following:	**YES**	**NO**
Inmates of penal institutions	☐	X
Institutionalized intellectually handicapped	☐	X
Institutionalized mentally disabled	☐	X
Committed patients	☐	X
Intellectually handicapped outpatient	☐	X
Mentally disabled outpatient	☐	X
Pregnant women	☐	X
Fetus in utero	☐	X
Viable fetus	☐	X
Nonviable fetus	☐	X
Dead fetus	☐	X
In Vitro fertilization	☐	X
Minors (under 18)	☐	X

For each "Yes", state what precautions you will use to obtain informed consent?
NA

How is information Obtained? (Include instruments used. Attach copy of instrument to this application.)

Interviews, observation, journal entries, written materials, and focus groups

Confidentiality – Are data recorded anonymously? ☐Yes XNo

If answer is "No", how will the study subjects' confidentiality be maintained?
A coding system will be used to keep participants anonymity.

Appendix A (*continued*)

<table>
<tr><td colspan="4">Benefit of research:Click here to enter text.
Seeks to contribute to the body of knowledge and illuminate the perceptions of traditionally poor and marginalized rural women. Moreover, it seeks to explore the women experiences accessing improved water in their villages, and unearth the views on sustainable development in its economic, social, and environmental dimensions. Knowledge on what the women seek to maintain and what they seek to develop will add to the sustainability dialogue. Policymakers, local government, NGOs, and other women organizations may benefit from this study given the importance of sustainable development goals in the post 2015 Development Agenda, and the absence of participatory approaches from indigenous stakeholders. The research study will be performed on a gratuitous basis, respecting the identity and anonymity of the subjects, and their participation will be voluntary. Participants may withdraw from the research study at any time and choose not to answer questions. There will be no particular benefit to the participants, and participation will be optional.</td></tr>
<tr><td colspan="4">Possible risk to subjects: No risks are anticipated, however, there might be minimum risk. Perhaps the participants may not be comfortable being interviewed.</td></tr>
<tr><td>Funding Source:
None</td><td>Funded by:
Self-funded</td><td>Grant Proposal Pending:
None</td><td>Not Funded: ☐</td></tr>
</table>

CHECKLIST:

Research protocol X
Informed consent documents X
Instruments used for data collection X
CITI certificate of training on the protection of human subjects X

If change in research occurs the Board must be notified before research is continued.

Appendix A (*continued*)

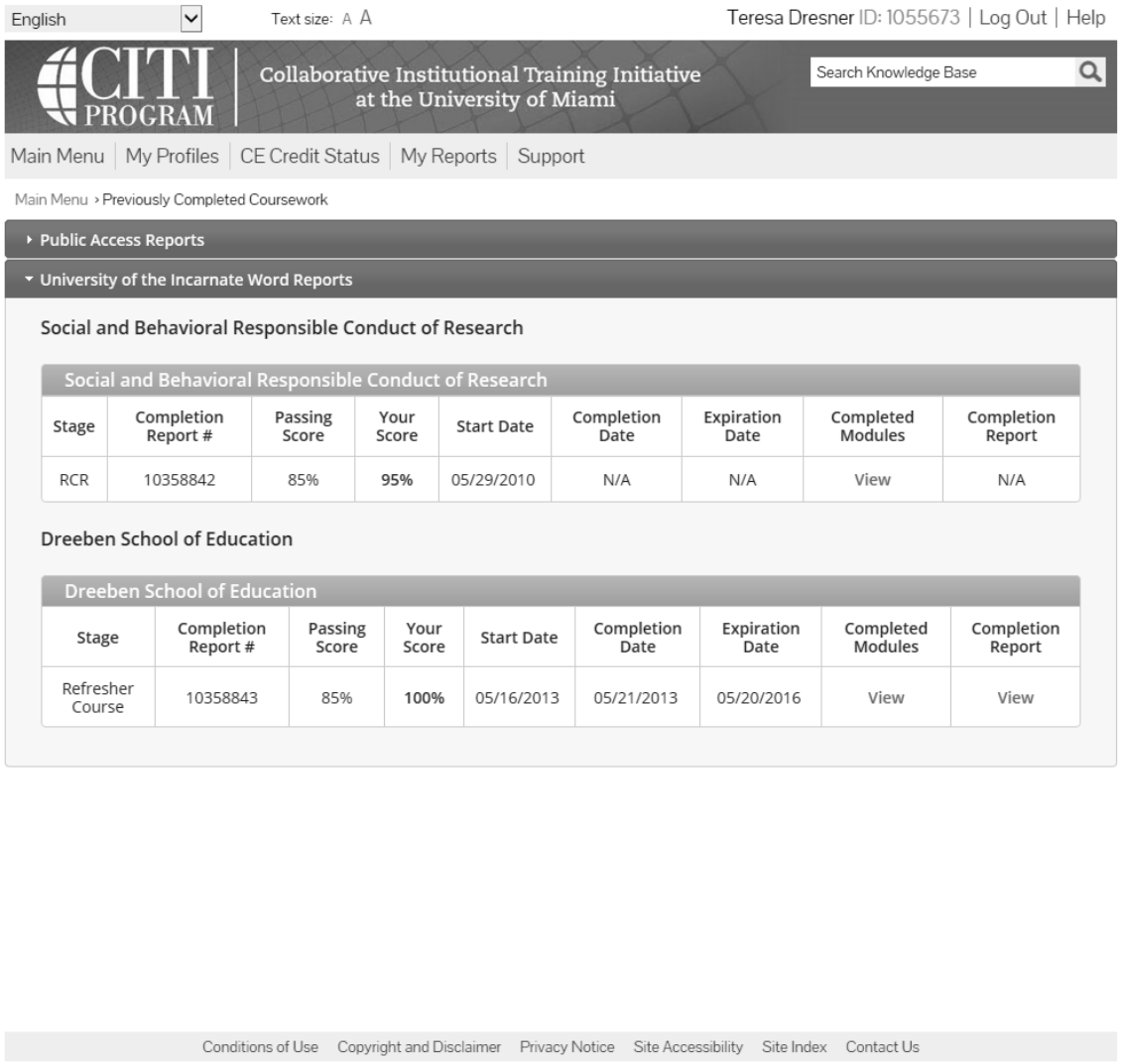
SIGNATURES		
Original Signatures are required. This application will not be processed until all signatures are obtained.		
Signature of the Principal Investigator The undersigned accepts responsibility for the study, including adherence to DHHS, FDA, and UIW policies regarding protections of the rights and welfare of human subjects participating in the study. In the case of student protocols, the faculty supervisor and the student share responsibility for adherence to policies.		
Print Name of Principal Investigator: **Teresa M. Dresner**	**Signature of Principal Investigator:**	**Date:**
Signature of Faculty Research Supervisor – Required By signing this form, the faculty research supervisor attests that he/she has read the attached protocol submitted for IRB review, and agrees to provide appropriate education and supervision of the student investigator above.		
Print Name of Faculty Supervisor: Absael Antelo, Ph.D.	**Signature of Faculty Supervisor:**	**Date:**
Signature of Co-investigator(s)		
Print Name of Co-Investigator: **Continue if there are more co-investigators. All must sign.**	**Signature of Co-Investigator:**	**Date:**

APPROVAL SIGNATURE(S)		
Signature of the IRB College/School Representative:		
Print Name of College/School Rep.:	**Signature of College/School Rep.:**	**Date:**
Signature of the IRB Chair (if needed)		
Print Name of IRB Chair:	**Signature of IRB Chair:**	**Date:**

Application Number:
The Researcher must use copies of the **stamped** consent form. Other communications to the study subjects must also be stamped with the IRB approval number. Electronic surveys must have the IRB approval number inserted into the survey before they are used. IRBs are filed by their number and helps the Graduate Office keep track of submissions and communications. Please refer to this number when communicating about the IRB.

Appendix B

Collaborative Institutional Training Initiative Completion Report



English Text size: A A Teresa Dresner ID: 1055673 | Log Out | Help

CITI PROGRAM | Collaborative Institutional Training Initiative at the University of Miami

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Social and Behavioral Responsible Conduct of Research

Social and Behavioral Responsible Conduct of Research								
Stage	Completion Report #	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Completed Modules	Completion Report
RCR	10358842	85%	**95%**	05/29/2010	N/A	N/A	View	N/A

Dreeben School of Education

Dreeben School of Education								
Stage	Completion Report #	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Completed Modules	Completion Report
Refresher Course	10358843	85%	**100%**	05/16/2013	05/21/2013	05/20/2016	View	View

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Appendix C

Consent Form

Appendix A:

CONSENT FORM

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Project Title:	Sustainable Development and the Issue of Water in Bukoba, Tanzania
Principal Investigator:	Teresa M. Dresner School of Education in Organizational Leadership University of the Incarnate Word, San Antonio, TX 78209
Contact Information:	Tere.dissertation@gmail.com
The Purpose:	Thank you for agreeing to participate in this study. The purpose of this study is to contribute to the understanding of how a group of rural women from the Kagera region in Tanzania perceive sustainable development as a result of their experiences with improved access to water and sanitation. Your signature on this form shows that you have been well informed about the study.
Procedures:	You will be asked to allow me to interview you in one of two languages of your preference: English or Swahili. Interviews will be about one hour, audio-taped, and later transcribed by me.
Voluntary Participation:	Participation is voluntary. You can withdraw from the study any time, for any reason, without penalty.
Risks and Benefits:	There are no risks or harm associated with this study. Your participation may provide valuable information that may provide insight into the meaning of sustainable development as a result of an improved access to water and sanitation.
Confidentiality and	Complete confidentiality is ensured and anonymity is . Identifying information will remain confidential, no names will be used. You will be assigned a number to guarantee your anonymity.
Right to ask question	You may use my e-mail address to ask any questions about the study before participating or during the study.
Right to obtain results:	I would be happy to share the findings with you after the research is completed.
Voluntary Consent:	I have read the information provided and agree to participate in this research project

Participant's Signature _____ Date _____

Investigator's Signature _____ Date _____

University of the Incarnate Word
IRB Approved
Application No. 13-05-021

Appendix C (*continued*)

Consent Form in Kiswahili

FOMU YA MAKUBALIANO YA HIARI MAKUBALIANO YA KUSHIRIKI KWENKYE UTAFITI Kichwa cha utafiti	Maendeleo Endelevu na Suala la Maji Bukoba, Tanzania
Mpelelzi mkuu	Teresa M. Dresner School of Education in Organizational Leadership University of the Incarnate Word, San Antonio, TX 78209
Mawasiliano	Tere.dissertation@gmail.com
Kusudi	Ahsanteni kwa kukubali kushiriki kweny utafit huu. Madhumuni ya utafiti huu ni kuchangia kuelewa jinsi vile kikundi cha wanawake wa mkoa wa Kagera, Tanzania wanavyo elewa maindeleo endelevu kutokana na tajriba yao ya kuboresha upatikanaji wa maji na usafi wa mazingira.Sahihi yaki kwenye fomu hii inaonyesha kwamba umeelewa vizuri kuhusu utafiti huu.
Taratibu	Utaulizwa uniruhusu kukuhoji katika lugha moja utakayo chagua kati ya lugha mbili; Kingereza au Kiswahili. Mahojiano yatachukuwa karibu saa moja, yatarekodiwa na baadaye nitayachapisha
Kushiriki kwa hiari	Kushiriki ni kwa hiari. Waweza kujiondoa kutoka kwa utafiti huu wakati wowote, kwa sababu yoe, bila adhabu.
Hatari na faida	Hakuna hatari au madhara yanayohusiana na utafiti huu. Ushiriki wako waweza ukatoa ufahamu wa maana ya maendeleo endelevu kma matokeo ya kuboresha upatikanaji wa maji na usafi wa mazingira.
Usiri	Usiri Kamili utahakikishwa na kutokujulikana. Kutambua habari kutabaki siri, hakuna majina yatatumiwa. Utapatiwa nambari kuhakikisha kutojulikana kwako.
Haki ya kuuliza maswali	Unawaza tumia anwani yangu ya e-mail kuuliza maswali yoyote kuhusu utafiti huu kabla ya kushiriki au wakati wa utafiti.
Haki ya kupata matokeo	Nitakuwa na furaha kukufahamisha matokeo baada ya kukamilisha utafiti.
Ridhaa y hiari	Nimesoma taarifa niliyopatiwa na nimekubali kishiriki katika utafiti huu.
Sahihi ya mshiriki	Tarehe
Sahihi ya mpelelezi	Tarehe

Appendix D

Interview Protocol

General questions about demographics will be asked at the beginning of the interview. Additionally, the questions will be asked with a past and present orientation seeking to understand what the BUWEA women want to sustain and what they want to develop. Impact of the rainwater harvesters in all three dimensions of sustainable development will also be explored: economic, social, and environment.

Past/Present

Has being part of the BUWEA organization influenced your access to water?

Tell me what it was like to get water on a typical day in the past, and how is it now? (routine).

How did you get the water in the past, and how do you get it now? (source/amount).

How long have you or someone else in the household been getting water? (if they collected water as children explore how it impacted their lives growing up in the context of the three dimensions)

How long did it take to get water in the past, and how long does it take now? (time/distance)

Water Impact

What changes have occurred, if any, as a result of the new source of water or the rain harvester? (explore in the context of economic, social, and environment)

How do gender or age influence who is responsible for getting the water?

How is the water being used?

Who makes the decisions on how to use it?

Impact of rain-harvester

What are the benefits, if any, as a result of the new rain-harvester?

Is having a rain harvester affected you, your family, your village? If so, how?

Did you receive training to build the rain harvester? If so, what type of training?

Appendix D (*continued*)

How are you maintaining the new source of water?

What are your plans for accessing water in the future?

How is having a rain harvester influence your plans for yourself, your family, and your future?

Sustainability

What do you seek to sustain as a result from their experience accessing water? (economic – micro-business; social – education, illness; environmental – contamination)

What do you seek to develop as a result from their experience accessing water? (economic – micro-business; social – education, illness; environmental – contamination)

How do you describe your experiences with improved access to water? (explore sustainable development ideas)

How do you ensure that the rainwater harvesters are sustainable?

Appendix D (*continued*)

Interview Protocol: Demographic Data

Village/Town _____

1. First Name _____
2. Local Women's Group _____
3. Position in BUWEA _____
4. Number of years with BUWEA _____
5. Marital Status: ☐Married ☐Single ☐Cohabiting ☐Divorced ☐Widowed
6. Age _____
7. Number of years of school _____
8. Number of children _____
9. Total number of dependents _____
10. Total number of people living in the house_____
11. Type of business:

    Specify _____

THANK YOU!

Appendix D (*continued*)

Interview Protocol: Demographic Data in Kiswahili

Kijiji/Mji _____

1. Jina la kwanza _____
2. Kikundi cha wanawake _____
3. Nafasi katika BUWEA _____
4. Idadi ya miaka katika BUWEA _____
5. Hali ya ndoa: ☐Umeolewa ☐Haujaolewa ☐Unaishi na mjumba ☐Umetalakiwa ☐mjane
6. Umri _____
7. Idadi ya miaka uliyo enda shule _____
8. Idadi ya watoto _____
9. Idadi ya watu wanaokutegemea _____
10. Idadi ya watu wanoishi katika nyumba yako _____
11. Type of business: _____
12. Biashara unayoifanya _____

    Fafanua _____

ASANTE

Appendix E

Copyright Approval From Dr. Kates

Robert Kates

Dear Tere Dresner-Salinas:

You may certainly use the diagram.

Have you read my mentor's Gilbert White's 1972 book: Drawers of water: Domestic water use in East Africa and the subsequent restudy by John Thompson. For references and more detail see the two memorials for White on my web site.

And do let me know the results of your study,

Bob Kates

Appendix F

Copyright Approval From Dr. Griggs

Dave Griggs

Hi Tere

You are welcome to use the framework, but please attribute it back to the paper so that people can trace it back to source.

Appendix G

Copyright Approval From Dr. Ettling

Ettling, Sr Dorothy H.

Tere Dresner

You do have permission to use the graphic pictures of Women's Global Connection processes for your dissertation research.
Good luck as you continue to go forward with this important study.

Dorothy Ettling Ph.D.
Board of Trustees Chair
Women's Global Connection of San Antonio
San Antonio, TX, USA

Appendix H

Copyright Approval From Dr. Schram

Schram, Tom

Tere,

I am pleased to hear my work has been useful to you.

Of course, you have my permission to use those figures from my book, if they are helpful to your proposal.

Best of luck as you move forward.

Tom

Tom Schram, Ph.D.
Associate Professor and Director of Teacher Education
Education Department
University of New Hampshire
202 Morrill Hall
62 College Road
Durham, NH 03824-3595

Appendix I

Copyright Approval From United Nations

Re: Permission Requested for a Dissertation
Johnson Gathia [gathia@un.org]; on behalf of; Permissions [permissions@un.org]

Dear Tere,

Please note that permission is granted free of charge.

In all cases we request that a standard credit line be included:

"from (full title of the publication you are using), by (author(s)/editor(s)/department name), © (copyright year) United Nations. Reprinted with the permission of the United Nations.

Regards,

Johnson Gathia
United Nations Publications
New York

Appendix J

Copyright Approval From Dr. Wells

Thomas Wells Aug 12

Dear Tere Dresner-Salinas,

Of course.

Kind regards,

--
Thomas Wells
[redacted]