

SUSTAINABLE GENDER EQUALITY FRAMEWORK: A JUSTICE PERSPECTIVE

by

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Abstract

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Current study emphasizes gender equality discourse within the frame of overarching sustainable development goals and proposes a shift in attention to the sustainability of components of a larger holistic social system that is built on moral imperatives of intra and intergenerational justice. The continued and building importance of the holistic and transferability of a just and inclusive system is indicative of the new global policy shift in addressing the lessons learned from past developmental approaches and the urgent need to protect the earth system. There are three key related issues that stand out within the broad context of *Our Common Future* published from the Brundtland Commission: 1) the intergenerational emphasis in development and addressing the needs explicit in the definition; 2) the added environmental focus to the previous development agenda of socio-economic advancement, and finally, 3) the related SDG goals and ways to measure their outcomes in the new policy spectrum. Given the several short comings, this study develops a framework focusing on the sustainability of gender equality and addresses the theoretical and methodological gaps in the existing literature. It tests the framework of social, natural, economic, built and human capital influence on sustainable gender equality while understanding the role of women's rights in promoting sustainable gender equality. The study recommends investment in women's rights and

systematically accounting women and girls by addressing pervasive gender data gaps and gender biases in measures as important steps towards sustainable gender equality.

In Chapter I, amidst all the debate around sustainable development, this chapter identifies a lack of quantitatively tested framework for sustainable gender equality. It proposes to test the moderating effect of women's rights on capital and sustainable gender equality. It also proposes to test the structural framework of sustainable gender equality.

Chapter II covers the literature on much debated environment and the place of gender role in sustainable development. It looks at historical events and policies that brought environmental focus within the scope of economic and social development.

Chapter III, reviews literature on values of social justice, particularly freedom to do and be, equality and fairness within the context of sustainable development. It highlights the economics of sustainable development and the capital perspectives based on modernization theory on global development. These three concepts are at the heart of sustainable gender justice debates and this chapter provides the conceptual grounding for this study.

In Chapter IV, this study presents the conceptual framework and the proposed hypotheses that guide the analyses.

Chapter V presents the methodology applied in testing the proposed hypotheses and the final model. It covers the source of data, sample, data screening, analysis, indices developed, regressions and structural model.

Finally, in Chapter VI, the study ties the literature, theoretical guidance, and analyses to discuss the outcome of the quantitative analysis in the study. It further highlights the future directions, strengths and limitations, and implications of the study for social work.

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Chapter 1

Introduction

Perhaps no other agenda, during the last several decades, has become as central to development programs as the promotion of gender equality. Gender equality is seen not only as a necessary condition for achieving social justice, but also as an economically, socially, and environmentally viable strategy for improving the wellbeing of current and future generations. The commitment to achieve gender equality is clearly reflected in the two global development agendas: the Millennium Development Goals (MDGs), which began in the year 2000 and the Sustainable Development Goals (SDGs) in 2015. Millennium Development in Goal 3 stated “Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015”. The fifth among the 17 SDGs states “Achieve gender equality and empower all women and girls” by 2030. This commitment to gender equality in both developmental agenda clearly reflects the importance attributed to gender equality for the eradication of poverty and empowerment of women. Furthermore, its repeated mention under new set of global goals to achieve reflects the dissatisfaction and a feeling of failure of global institutions in bringing about gender equality worldwide.

The previously set goals of the MDGs achieved significant progress in the last 15 years since its initiation. It assisted more than one billion people out of extreme poverty and reduced it from nearly half of the population down to 14 percent; made inroads against hunger; enabled more girls to attend school than ever before, and made significant efforts towards environmental gains (UN, 2015). Many countries achieved the target to eliminate gender disparity in all levels of education to where only 74 girls were enrolled in primary school for every 100 boys in 1990, now improved to 103 girls enrolled for every 100 boys in South Asia (UN, 2015). Although significant improvements were made in enrollment of girls in schools, they still fall far behind in secondary and tertiary level education with only 4 percent of the countries meeting that goal, while attendance is still an issue that remains to be addressed

(UN, 2015). Progress, particularly seems to bypass women, especially in the disparities between rural and urban people. Women's labor participation and political representation have increased, but parity remains a distant goal (UN, 2015). Sufficient lack of access to markets, affordable healthcare and medicines, and the expansive digital divide in information and communication technologies (ICTs) between developing countries and the developed nations continue to leave many women behind (UN, 2015a). Women continue to face discrimination in access to labor market, economic assets, and participation in public and private decision-making (UN, 2015). Clearly, there is a continuing need to focus on gender equality especially in developing countries.

MDGs was highly criticized as being too instrumental and lacking a broader social change objective (Kabeer, 2005). The underlying complex structural injustices and power dynamics of gender relations that transpire into inequalities in every aspect of life seems to have been ignored in addressing inequalities. Understanding these critical issues and promoting justice through clear goals for structural change in promoting the rights of women, addressing cultural norms and traditional gender roles that hinder women's empowerment and access to political roles may be the sustaining factors in sustainability of gender equality. Providing social and structural support and political voice can have significant impact on advancement of women's rights. For instance, more developed countries, such as France, United Kingdom or United States have improved level of equality among men and women compared to developing countries. They also tend to have a history of feminist struggles that have made significant and substantial contributions in most spheres of life (Htun and Weldon, 2012). In developing countries where women have less opportunity to organize, express their rights and/ or fight for their freedom, such as in Yemen, women's inequality is persistent (Murray 2013; UNICEF 2011). Common practices that compromise the life of girls and women through child marriages, honor killings, genital mutilation, and exclusion from labor force participation as well as political leadership keep women marginalized and vulnerable. These

trends have been worrying in countries like Mali, Benin, and Morocco. Any headway made has taken a back-step in gender equality because of poverty and lack of political stability (Phillips, 2015). Such observations crave for answers to the question of how do we make gender equality gains sustainable? How do we make sure it is continued through to subsequent generations?

All forms of discriminations, including gender inequality, compromise the full contributions men and women can make towards the society. Realizing the economic, political, environmental, and social rights of all members of the society and eliminating all forms of inequalities are therefore important elements of a framework for sustainable gender development. Previous global policies, such as the MDGs were criticized for ignoring the structural and physical system of gender inequality. Kabeer (2003) noted that gender inequality is at the heart of deepening poverty and must, therefore, constitute as every part of measures to eradicate poverty. A gender equity approach and a broader capture of gender equity in the policy and practice framework must be omnipresent in all sustainable development goals and should not be limited to the fifth goal on the agenda.

However, addressing equality separate from the prevailing social conditions makes it a target difficult to attain (Unterhalter, 2005). As such, environmental concerns have been already added to acknowledge structural socio-economic inequalities that continue to leave women behind throughout the life course. The unsustainable path to industrialization and market development, food and energy crisis, environmental and financial catastrophes, and urban and rural exploitations of the poor impact those who are the most vulnerable. They add to the poverty and inequality of world's one-third of the population that directly depend on environment as their livelihood (Unmüßig, Sachs and Fatheuer, 2012). Women and girls are most often impacted more by stresses and shocks in economic, environmental, and social spheres of life (Neumayer and Plümper, 2007). Some propose that the cause and underlying drivers of gender inequality and environmental exploitations are interlocked. They are driven by

the same under-regulated development approach of market growth that promote unequal power relations, lack of inclusiveness, and environmental manipulations (Wichterich, 2012).

While the focus on gender equality has remained consistent across the two developmental agendas, its inclusion under the SDGs reflects the need to not only achieve gender equality but also in 'sustaining' it. This could either mean not losing momentum or lose gained grounds in gender equality, or finding gender equality within the environmental function or both. This later focus over the sustainability of gender equality as a component of an overall developmental agenda may be attributed to the growth of sustainable environmental focus. These are concepts that have been under intense debate for some time (Johnson, 2000; Glasby, 2002; Wheeler, 2004). The last fifty years has seen sustainable development highlighted under the leadership of the World Commission on Environment and Development (WCED, 1987) also known as the Brundtland Commission which provided a clear definition of the sustainability concept in its well-known report, *Our Common Future* (the Brundtland report):

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- (WCED, 1987, p. 43).

There are three key related issues that stand out within the context of *Our Common Future*: 1) the intergeneration emphasis in development explicit in the definition; 2) the added environmental focus to the previous development agenda of socio-economic advancement, and finally, 3) the related SDG goals and ways to measure their outcomes. The current study places emphasis on the gender equality discourse within the frame of these overarching sustainable goals and proposes a shift of attention to the sustainability of components of a larger holistic social system that is built on moral imperatives of equality and intergenerational justice. The building importance of this virtue is indicative in the new policy shift from previous ones to the current SDGs. These new goals incorporate a whole new spectrum of gender equality and empowerment sub goals in SDG 5 to include: ending discrimination and violence,

preventing exploitations of women and harmful practices such as child marriage and genital mutilation of girls. It also has set goals to promote women on all spectrum of political, social, and economic leaderships; promote good health, education, and land rights as well as engage them fully in technological advances that are taking place around the world (UN, 2015b, see Table 1.1).

This study is significant for several reasons, both theoretically and methodologically. First, at the theoretical level it pioneers model development in sustainable gender justice. While there have been many cross-national studies on gender equality, there is paucity of research on sustainable gender equality framework that addresses this concern. The need for theoretical development in this content area, is also motivated by the pressing need to strengthen the theoretical basis on the subject necessary for the development of sustainable gender equality oriented policies. Second, given the scarcity of theories on *sustainable* gender equality, there is a lack of conceptual understanding of the several facets of the concept. Sustainability is often defined in terms of environment or generations, where gender equality policies and programs are achieved through programs and policies developed at various meso levels such as communities, towns, and cities. This inherent association of gender equality programs and projects with environment and intergenerational variation appear to be very poorly developed quantitatively.

At the methodological level, attempts to measure sustainable gender equality in this study is to this author's knowledge, a first of its kind. Though prior studies provide several theoretically relevant indicators of latent determinants such as 'environment' and 'socio-economic' structures and "social justice" virtues, very few studies have attempted to test a structural model of sustainable gender equality. Second, theoretical inadequacies in the conceptualization of sustainable gender equality that promotes the rights of women have profoundly influenced the development of sustainable gender equality measures. Third, more

specifically, there has been very little attention paid to the inherent environmental and intergenerational justice related variations in sustainable gender equality measures.

Given the several theoretical and methodological shortcomings noted above, this study proposes to develop a framework of sustainable gender equality to address the gaps in the existing literature on sustainable gender equality. It will also test the effect of capital on sustainable gender equality moderated by women's rights, and explore the role of economic, social, and political women's rights in testing a model for sustainable gender equality.

To explore the pertinent concept of sustainable gender equality, it is important to understand what has been done in the past and where we stand in achieving it. The next section reviews global policy discourse on sustainable development and gender equality literature. It addresses what has been done and identifies the gap that remains to be resolved to comprehensively address gender equality.

Chapter 2

Review of the Literature

Background on Sustainable Development

There have been many philosophical discussions by scholars and philosophers about what entails sustainable development. Some have defined it in terms of sustainability as nondeclining utility function, capital, or human welfare over time (Hempel 2001). Within the nondeclining function others define it as resilience, where in the middle of disturbances, the system has the ability to maintain structural integrity, forms, and patterns of behavior (Common 1995). Munro, (1995) further described it as complex of activities that can be mobilized to improve the human condition and maintain it (Munro, 1995). More recently, 'self-sustainability' has been prolifically used as a popular jargon by the media, private, public, and civic organizations in different spheres of life that reflect on self-maintaining without support from an external source as well as renewability of products.

The term, self-sustainable in itself, adds an empowerment component to maintaining it. This terminology came to challenge the prevailing assumptions of previous programs and practices that were economically driven through international banking and modernization thoughts where, development was mostly related to economic investments. Economic school of thoughts believed that investing and transferring resources and technology from the developed world will shift the developing world towards an improved status. However, these types of interventions generated dependency among poorer nations and landed them in massive debts and in turn have generated huge wealth gap among the rich and the poor. Earlier research on investments made through International Monetary Fund (IMF) programs showed that they weakened nations' ability to enforce human rights protection by ignoring inclusion in its investment strategies (Abouharb and Cingranelli 2007, 2009; Donnelly 2003). This is due to transfer of power from the state to the market that enabled economic and other rights abuse while failing to protect those who are the weakest and in need of human rights protection

(Donnelly 2003, 2013; Englehart 2009). In other words, these types of investments did not particularly pay attention to inclusion and rights for diverse people in the society, including girls and women. The issues with such investments shifted the focus away from self-sustainability through community-driven development (CDD) programs and more towards reliance on big banks and external funding.

Still others have conceptualized sustainable system of development in ideological ways to where things do not damage each other but find a way to balance it. For instance, Voinov and Smith (1998), presented it as a system that is not damaging of other systems, both in space and time. It simply finds a comforting balance of physical and social contentment for living standards among humans within an ecological space where different components are maintained at levels of current or better standards (Voinov and Smith, 1998). While others visualized a healthy, growing economy leading to structural transformations and a higher standard of living. They envisioned a just system with equity and human rights, where civil societies and democratic participations were actively promoted and environment was maintained for now and the future (Sachs, 2008; Weaver, Rock, & Kusterer, 1997). The recent emphasis on environment and place based initiatives have linked sustainability to the urgency of maintaining earth's ecosystem from being destroyed (Hansen, Kharecha, Sato, Masson-Delmotte, Ackerman, et. al., 2013). This view has taken a momentum of its own in the last fifty years with heated debate on the urgency to correct the earth system as well as to stop the exploitations of human and non-human resources.

Brundtland Report and Environment in Sustainable Development

The Brundtland report and other contemporary highlights on sustainable development came from numerous environmental movements: the first global conference on the Human Environment, in Stockholm, Sweden 1970; the 1987 World Commission on Environment and the Brundtland Commission that published *Our Common World*; the Earth Summit in Rio, Brazil, 1992 that promoted the global environmental protection Agenda 21 and its plan of action

to be part of national strategies around the world, and more recently, the 2015 Paris Climate Agreement. Build up to these conferences was the significant essays of Rachel Carson in the early 1960s, mainly, the *Silent Spring*, detailing harmful effects of pesticides on humans and environment. Her work drew significant debates where her critiques deemed her villain to human progress (Darby, 1962). Scientific innovations to meet the needs of exploding population growth and feeding the world's hungry had taken on commercial farming to heart and a rise in use of pesticides such as DDT, aldrin and deildrin to maximize crops were lauded around the time. Destruction of forests to make space for the population growth was not taken as detrimental to the future of humanity and the earth system. Carson's reports presented factual evidence of abuse of these chemicals and made an appeal for human health considerations, a moral consideration for non-humans, and the value of preserving the wilderness (Cafaro, 2002).

Up until the first decade of the twenty-first century, climate change advocacy was deemed an alarmist propaganda and fear mongering. However, proponents of environment protection and justice, at the global policy level, took these issues seriously and the notion of earth's unlimited resources and its natural cycle to renew itself have been deeply questioned. Facts are becoming more compelling. The world health report in 2003, reported unintentional poisoning deaths estimated to be at 355,000, globally, each year (World Health Organization [WHO], 2003). Two-thirds of these deaths were in developing countries where such poisonings are strongly associated with inappropriate use of and excessive exposure to harmful chemicals and toxins (WHO, 2016). Toxic chemicals from industrial processing, mining, and unstable forms of agriculture have been known to seep into land, air, and water more than the tolerance level to human health (Yáñez L et al., 2002). Acute exposure to such toxins have known to cause death or serious illness, including reproductive disorders, endocrine and immune system disruptions, impaired nervous system functioning and some cancers with more adverse effects on children from concentration of such chemicals within the food chain (WHO, 2016).

Production of such chemicals are known to be mostly coming from the developed nations and are expected to rise 85% from 1995 to 2020 (Organization for Economic Co-operation and Development, Environment Directorate [OECD], 2001).

Furthermore, increased level of carbon emission has also been known to be produced mainly by the developed world (Hansen, Kharecha, Sato, Masson-Delmotte, Ackerman, et. al., 2013). Earth atmospheric temperature changes in the last century with more frequent environmental disasters have environmental advocates point to industrial production of carbon emission and overproduction of natural resources for energy usage. This long-term impact on global warming are as result of forced climate change caused by increased human-made atmospheric gases such as CO₂ (Intergenerational Panel on Climate Change, 2007). The urgency to correct these human errors is most evident by the fact that almost all the nations around the globe became signatory to the SDGs, and mainstreamed environmental sustainability with other development agenda of economic and social dimensions, in the last two decades.

Mainstreaming Environment with Economic and Social Agendas

The issues of environmental pollution and destruction through exploitation of the world's poorest in the name of development have been tied to the debate of utilitarian purposes of market economy and patriarchal exploitation. Accordingly, the valuation of nature in terms of the economic view of efficiency and cost analysis undermines the nonmonetary costs and risks that are difficult to account for. At the heart of cost-benefit analysis is the discussion of maintenance and growth of capitals (Goodland, 2002). Particularly, neoliberal advocates of the market economy continue to perceive environmental protection as the related evils of expanded state and restorative justice. Still for environmentalist the success of their advocacy lies in the mainstreaming of environment with economic and social dimension. At the heart of mainstreaming three dimensions is the transitional perspective view of sustainability that promotes moral principal and process as a guide to human action (Hardi, 2007; Parris & Kates,

2003; Pezzey, 1992). Such evaluative understanding of sustainability has been well explored by Schroeter (2008).

These aspects of socioeconomic and ecological dimension have manifested through community programs or policies of human development as nature preservation and responsible pursuit of economic capital. The pursuit of securing economic stability while seeking social justice and maintaining the integrity of the ecological systems (Viederman, 1995) has been presented as multi sectoral and multi scale system with continuous change (Hardi, 2007). Viederman (1995) expanded the three dimensions to the associated varied capitals necessary for a sustainable community. Here, sustainability was presented as the ability to adapt to changing conditions in the dynamics of the system (Patton, 1994) and finds its ties with resiliency. The ecosystem perspective has been presented as the dynamic function of social, economic, and environmental exchanges borrowed from the biological sciences. It promotes an open system of innovations within the three dimensions, but also makes it a point of return to traditional, indigenous, natural, and cultural ways to development (Aaker and Shumaker, 1996). This notion has taken on a global development perspective along with the transitional nature of the evolutionary models and perspectives of sustainability (Kraft & O'Neill, 2007).

Gender and Environment Link

Sustainable development involves nurturing of traditional values and cultures while keeping individual and group empowerment in perspective. Proponents of ecological viewpoints, in general, made it clear that the path of avoiding destruction and exploitation of natural resources needed mobilization of involved communities and work toward more just, equitable and sustainable livelihoods for all. The magnitude of social, economic, and environmental impact of climate change and the scope of loss of essential ecosystems have been linked to the higher numbers and levels of floods, droughts, and devastated landscapes and livelihoods around the globe (Hansen, J., Kharecha, P., Sato, M., Masson-Delmotte, V., Ackerman, F., et al., 2013). These climate devastations have dire consequences, such as

conflicts and wars, refugees and displacements, food shortages, and the impact can be felt all the way to the global market (Sachs, 2008). Among those most affected are usually girls and women, given the precarious nature of their sustenance and livelihood. The burden of securing food, shelter, water, and fuel largely falls upon women in many countries where men usually travel away from home to find work in remote towns and countries.

This concept of intricately weaving women with the environment in global development began from the Rio 20 conference on environment in 1992 called the earth summit (UNSD, 1992) where women were identified as having an important role in management and development of environment. The plan has been to bring women as fifty percent of the workforce to the forefront and be involved in the next wave of development. This was further reinforced by other subsequent conferences and mainly highlighted in the Beijing conference (United Nations, 1995). Women's rights advocates had taken the opportunity presented by the launch of *Universal Declaration of Human Rights* in 1948 post World Wars in Europe and North America, to build the momentum, on bringing focus on women's equity. The turning point was in 1975 when the United Nations General Assembly proclaimed it as the International Women's Year and put equity on the global agenda (United Nations, 2014). The following decade saw a global effort to examine the status and rights of women and bring them to all levels of decision-making (United Nations, 1995).

In 1995, the legally binding Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) was adopted to set an international standard for equality between women and men. A major force in facilitating this highlight on women's advocacy were the non-governmental sector (NGOs). Particularly, women's organizations and feminist groups became the major actor for the changes. Many international partners focused on women's status and roles in their society, while other non-governmental organizations played important advocacy roles in advancing legislation or mechanisms to ensure the promotion of women's rights and became the catalysts towards new approaches to

development (United Nations, 1995). This came ten years after the Nairobi Conference on development for women, where equality between women and men was still vague and women represented only 10 percent of all elected legislators worldwide, in most administrative structures (United Nations, 1995). In both public and private spheres, they remained underrepresented. The same platform was also used to highlight the environmental considerations. Although gender mainstreaming as public policies and practices were introduced in the 1985 Third World Conference on Women in Nairobi, mainstreaming of environmental focus was highlighted in the Beijing Conference. The eighth goal of sustainability was added along with the gender equality goal in the MDGs, in 2000. These conferences represented heavy emphasis placed on importance of progress in achieving equality between women and men along with the rising call for environmental preservation.

Women and environment have been intricately linked in global policies. [It is important to note that women's movement, since the beginning of times and particularly through waves of feminist activism and labor movements, has been intricately linked with other activism such as abolition and civil rights.] Connecting gender inequality issues to sustainable development goals became simpler and given for various reasons. First, driven by the moral and ethical imperatives, the sustainable efforts to achieve a just society should not ignore the rights, dignities, and capabilities of women and girls who represent half the world's population. To bring significant attention to this, policy actions for sustainability needed to readdress the disproportionate impact previous policies and programs have made on women and girls on economic, social, and environmental fronts (Women's Survey, 2014). Based on Women's Survey, 2014, women's knowledge, their capabilities, and their impact of collective action can have a huge potential in enhancing the ecosystem conservation and sustainable use of natural resources while improving the productivity of sustainable, low-carbon food, energy, water, and health systems (United Nations, 2014). Accordingly, women are central to many of the sustainable development goals as they are often at the forefront of social movements while

resisting unsustainable pathways. Their knowledge, action, and agency in all aspects of life have been undermined through diminished social roles and voice in sound sustainable ways to manage local ecologies, adapt to climate change, and manage food, water, and other services. Bringing these to the forefront could be the way to relieve poverty and other ills in the world while promoting and sustaining their equal status in society.

This notion for promoting women as the primary caretaker of the environment has few critical feminist perspectives. First, ecofeminist perspective on gender issues and environment have been intricately linked as codependents and co-victims of the market economy and patriarchal oppression and exploitation (Mann, 2012). Entrenched poverty and hunger, rising inequalities among the rich and the poor, ecosystem destructions to meet the demanding needs of uncontrolled population growth, drastic climate changes and displacement of people, all of which in large part has been blamed to the prevailing economic models. The paradigm, advocated by global policies and the likes of Irene Diamond, Gloria Feman Orenstein, Vandana Shiva, further link patriarchal economic models to women's biology and the harmful effects of new chemicals introduced in the twentieth century (Gaard & Murphy, 1998). They link environment to unprecedented challenges faced by women in realizing their rights that grossly undermines the sustainability of their households, communities, and societies.

Others note that women should not be viewed as victims, but should be considered as central actors in moving the system towards sustainability. To attain sustainable gender equality, advancing and sustaining the rights and capabilities of women and girls should involve them as stakeholder in every decision-making process (United Nations, 2014). Their equality and rights should not be compromised while integrating environmental policies. In fact, their existence and source of subsistence within the ecological system should be equally evaluated. Gendering of environment and the emphasis on ecofeminism from the South have also come under scrutiny by others (Resurrección, 2013; Elmhirst & Resurrección, 2008). They warn of risks for positioning women in environmental projects and programs that may disproportionately

overburden women. Giving primary caretaker responsibility of the environment to women by presenting a “women-as-victim-then-as-agent” may not represent the complex and daily realities of resource use, power, and negotiations (Elmhirst & Resurrección, 2008, p. 34). This vigilance also guards against making the same mistakes that were made through the economic movement of Women in Development (WID) projects in the 1980s that overburdened women with added workload and western hegemonic effort to involve them in formal labor participations. [WID, along with Women and Development (WAD) and Gender and Development (GAD) were highly criticized for generalizing women as a disenfranchised homogeneous group with inferior relationships with the society (Rathgeber, 1990).]

The criticism of tying women exclusively to environment are centered on the paraded notion of feminine subjects as the stable icon of feminist environmental advocacy (Resurrección, 2013). Accordingly, this politicizes the notion that ties in well with the view that politics attempts to create a center and offers a reason for women–environment linkages and makes them persistent and seductive (Resurrección, 2013). These viewpoints for women seem to disagree with the notion of homogenizing and hegemonizing gender identity through legitimizing claims within the environmental arena (Alcoff, 2000).

Rather, Resurrección (2013) suggests a context-specific and historically-nuanced understanding of the inter-relationship between women and their immediate and interlinked environmental resources, to identify the pathways of sustaining gender equality. This contextualized environment provides a person-in-the-environment perspective to where complex power relations within the structural aspect of social environment with the physical environment can be mediated through the power relations within the greater society. Hence, sustainable gender equality and analysis should focus on power relations between men and women, to where women should be represented as a disaggregated group of subjects and their understanding of environment should be analyzed further based on their roles in socially and historically constructed space.

Measuring Sustainable Gender Equality

Putting aside the debate on women and environment, addressing the challenges of building sustainable pathways to economic, social and environmental development and achieving gender equality have never been more urgent. More importantly, both challenges are of urgent needs to be addressed in the current global juncture. Addressing environmental sustainability, while fully realizing the human rights and equality of women and girls are at the center of new global policies.

One of the main reasons gender equality is high on the international policy agenda is given the accruing evidences from around the globe that promoting gender equality is key to development (Kevane, 2012). A critical first step requires a better understanding of how inequality is manifested around the world and identifying the contextual and structural spaces that facilitate it. Additionally, using appropriate indicators of development that are disaggregated to represent women and girls, in private and public space, may advance the rate of addressing inequalities efficiently.

Assessing evidences in gender gaps across nations is a beginning point to ensure gender and environment sustainability. For instance, Fisher and Naidoo, (2016) looked at 700,000 households and demonstrated the magnitude of gender gap in land ownerships and assets between male and female headed households using geographical mapping across 47 countries. They found that on average, male-headed households have 13% more assets in wealth and 30% more land for agriculture. Doss et. al. (2015) reported similar results; they used the World Bank's Living Standards and Measurement Surveys to show that the rates of only-male-owned land varied between 1.29 and 5 times more than for females in five African countries. Another study conducted in Latin America reported a large inequality in land ownership rendered to gender biases in inheritance practices, land markets and distribution (Deere & Leon, 2003). Other studies have consistently reported that female-headed households tend to be the poorest of the poor (Chant, 2008; Buvinic & Gupta, 1997; Chant,

1997). Furthermore, division of labor within a household and the burden of caring for the previous and future generations fall largely onto females which prevents women from making decisions, attaining education and good health, and own natural and economic resources (Kabeer (2011). Gender roles and relations are closely connected to collection of water natural resources and its use. Often, a young girl's lack of attendance, or completing schooling, or getting jobs, are hampered by social and physical challenges, such as collecting resources and water. They are quite often forced to spend much of their time in collecting water (Keefer & Bousalis, 2015).

To understand these dynamics of inequality, economic, social, built and natural capital, and ways women utilize their rights must be further explored in addressing this complex matrix of gender inequality manifestations. In an attempt to do so, first we must also explore how social justice and distributive rights have been addressed in the past. Hence, the next section will address the much-debated social justice literature in gender equality and sustainable development. There are a dearth of literature exploring these concepts; therefore, I discerningly revisit social justice literature in understanding equality, liberty and capital that underlie few of the many constituents of social justice as the mainframe for ways to define sustainable gender equality. It discusses the literature on efforts mostly defined by economic and social capital driven development in the discourse of gender justice and sustainable development.

Literature Review on Values that Underlie Sustainable Development

Social Justice and Sustainable Gender Equality

The concept of sustainable development is intricately weaved with the concept of social justice, whether it is for the environment, intergenerational justice and within the context of this paper, gender justice. Justice has been perceived differently through generations. Many cultures around the world have translated justice in their own terms through the ages whether in philosophical or religious ways. In natural law of understandings, Greeks' ideas of justice

were centered on interactions within a community. The community was a society that brought forth values and cultures to enrich the way of living. Members of any given community shared networks and bonds that balanced the system around them. They were based on attitudes and behaviors developed through shared experiences and societal structures that forged a community. In fact, the value of community and social cohesion were of such high importance that the roles of men and women were defined within the principles of community responsibility (Taylor, 2012). Accordingly, the two-fundamental moral and political principles were that the men and women were expected to confine themselves to the primary social roles that best fitted their temperament and education, and secondly, institutions that threatened the social structure and social cohesion of the community were not to be tolerated (Taylor, 2012). In this sense, there were no opportunities for social mobility among individuals and any form of uprising were considered as threat to the establishment. Moreover, women's role was defined within the private institution of marriage and they served as sexual liaisons who continued the existence of the ideal state through childbearing (Taylor, 2012).

Romans borrowed many concepts from the Greeks. However, they perceived justice within the context of individual actions that were right or just and translated it through legal actions rather than a broader community context. Yet, women were left out, then and till this day in many parts of the world, in the contracts, especially in terms of citizenship, land and property rights. Rights and ownerships, as well as social agreements and personal protections were the mainframe of Roman interpretations of justice. As always, these claims, although touted to be fair to all, favored the elite class more than the others and it's fair to say women were hardly mentioned in those debates. Inequality for women were pervasive in the system where women adultery or rape were punishable by death for women, while similar act by men would have less severe repercussions. This remains true in current times where some communities kill girls and women in the name of honor.

Contemporary views of social justice have been widely discussed through John Rawls' interpretations from his book *A Theory of Justice* (1971). He expanded the theory of social contract greatly discussed by Locke, Rousseau, and Kant. Rawls (1971) interpreted the original contract as a general idea of principles of justice for the basic structure of the society. A purely hypothetical characterization of justice, the original position proposed the principle of "veil of ignorance" where any one person is clueless about his structural standing in society nor his wealth, natural assets, abilities, or intelligence among others, and no one has any advantage over the others. Rawls proposed that only in such circumstances should the principles of justice be formed so no one has an unfair advantage over the other.

In his second principle, Rawls emphasized that loss of freedom for some cannot be made right by a greater good shared by others, and a just society should promote the liberties of equal citizenship. Although he didn't divulge into gender justice or intergenerational concepts of system, his discussion on structural social positions of advantages and disadvantages can be applied to many women born in the patriarchal society whose expectancies in life are continued to be limited by the dictate of a man and society. However, Sen in his *Idea of Justice* (2009), in contrast, advocated for a realistic comparative approach and aligned his thoughts with thinkers such as Adam Smith, Jeremy Bentham, Marquis de Condorcet, JS Mill, Mary Wollstonecraft, and Karl Marx, among others, in the process. According to Sen (2008), agreement on perfect and just institutions under the veil of equality, overlooking the apparent inequalities, are not practical. For example, a woman who is pregnant, or an adolescent girl, or an elderly woman all have different nutritional requirements. It will be unjust to expect them to have the same nutritional needs. Alternatively, using a comparative approach to justice, and coming to a consensus on what injustices of certain practices are, needs to be clarified in policies and programs that impact equality for women and girls and distributive justice.

Equity and Distributive Justice

Hobbes was the first thinker to subsume distributive justice as a moral concept traditionally associated with fairness and/or even-handedness, invoked usually to correct unreasonable adjudications arising from the application of general laws to particular cases (Mann, 2012). Other than John Stuart Mill, Karl Marx and Friedrich Engels highlighted women's oppression and provided the early conceptual framework on gender justice. Most of their work focused on property rights. Engels idea of institutionalized patriarchy in the form of controlling women's sexuality to prevent attaining property rights has continued to prevent women from receiving rights to own land. According to Engels, men accumulated land through intergenerational and systematic oppression of women creating structural barriers through patriarchal norms (Mann, 2012). Restrictions of propertied class women to venture into public spaces, unless chaperoned; women's relegation to the home and domestic activities, and punishment of women, not men, adulterations, were all systematic oppressions to control the property rights by men (Mann, 2012). In their quest for ownerships of assets and wealth, these restrictions have been redefined as "cultures" and "traditions" that continues to deny women their fundamental rights.

The concept of gender equity and gender justice reemerged strongly from the gender equity discourse within the feminist theory. Feminist theory has been at the heart of the equity movement. Beginning with the first wave of citizenship rights, and moving away from Karl Marx's class based theory, the New Left social movements of late modernity in the 1950s strongly addressed race, gender, and sexuality issues (Mann, 2012). The timing of the following postmodernism era that focused on capitalism, and furthermore, on globalization has led to deindustrialization of the West and contributed dramatically to higher inequalities in the global context (Mann, 2012). There continues to be an overwhelming male bias in the distribution of and access to resources and benefits from the development programs and policies (Agarwal 1998; Food and Agriculture Organization 1997; Heyzer 1997; International Development Research Centre 1998; Jacobson 1992; United Nations International Research

and Training Institute for the Advancement of Women 2002). Since males typically have more access to social and natural resources and do not necessarily share project gains (like income) with their families, males tend to benefit more from projects, and the gender gap widens.

Numerous studies documented that most sustainable development policies and practices without specific gender equity intentions and evaluations may entrench, and possibly intensify, inequities between males and females in families and communities (Chambers 1998). Representations of sex and gender or a “woman” and a “man” in gender analysis frameworks in global development work however, needs to fit in with the realities of an individual within the cultural context. To incorporate gender justice as norms in such complex cultural realities requires discussing situated inequalities and injustices. To an extent, these concerns have been extensively discussed in literature and bodies of theory with practical world demanding of identity politics, the politics of difference, the political pursuit of justice, and true empowerment of oppressed and disadvantaged groups through advocacies for inclusiveness and redistribution of policies and resources (Young 1990, 2000; Fraser 1997). There are evidences in many respects of gaining grounds in inclusion factors, yet progress continues to be slow in regards to redistribution or access to attain equality (Woodford-Berger, 2004). These literatures point out clearly that inclusion without empowerment or equality is a justice in vain.

Distribution and access to resources should follow the policies of inclusion. A gender equity approach and a broader capture of gender equity in the policy and practice framework must be omnipresent in sustainable development and the broader goals to ensure the new set of policies address these past issues. To understand this discourse, understanding the concept of social inclusion and exclusion is a given. Levitas (1996) identified and explored three political discourses associated within the concept of social exclusion. In redistributive discourse (RED), Levitas identified poverty as the principal cause of social exclusion, with economic redistribution as the most appropriate remedy. The moral underclass discourse (MUD) deploys cultural rather than material explanations of social exclusion, suggesting that people are

excluded because they fail to fit in with established social norms Levitas (1996). In the case of women, they have been excluded from attaining education based on the understanding that they are part the informal labor in the household. In the social inclusion discourse (SID), Levitas looked at lack of labor market attachment as the principal cause of social exclusion, and the proposed remedy by the society has been to encourage or require individuals to participate in paid formal work. Implementation of mostly the latter two have been the norms of ways to summon equality to change people's attitudes and cultures through aspects of policy that urges individuals to count any form of labor towards national accounts such as GDP. This concept of labor force participation in the workplace as the ground to attain equality has been the base of moral underclass discourse and is more apparent in recent utterances by recent political shift within the last couple of decades with an adopted enthusiastic theme of welfare to work. These discourses of social exclusion and inclusion are, of course, not mutually exclusive, but co-exist in various aspects of social policy at national and regional levels. One such policy has been previously described in the literature as Women in Development global programs in the 1980s. This approach to development ended up overburdening women in the developing world with little attention given to addressing patriarchal cultures that required women to continue with their house workloads while maintaining outside labor participation. Clearly, there are close inter-connectedness between discourses of inclusion and exclusion, on the one hand, while redistribution to attain the virtue of equality on the other.

Then there is the focus on the need for the future generations. Persistent inequality and intergenerational immobility between generations have been one of the most discussed topic, particularly, since the Brundtland report on intergenerational justice within the holistic concept of sustainable development. At the heart of this debate lies the time old concept of socialism and the liberal theory of capital market perspective. Marxist socialism has characterized capitalism [and globalization] as a source of class reproduction that continues to generate persistent inequalities between the bourgeois and the working class. While the latter

is committed to social mobility and equality of opportunity through a process of rational social section driven by industrial revolution, and commitment to technological and economic enhancements (Piketty, 2000). Liberal left wing long moved away from Plato's hereditary meritocracy of the chosen few to lead (Piketty, 2000) and more towards investment in human capital and other forms of capital to promote social mobility. However, neoclassical liberal theory of investment and healthy market to self-correct persistent gender inequality and other forms of disparities are obviously not sufficient, since the investments either never reach or only a minimal have access to them.

Taken to the context of sustainable development, addressing persistent gender inequalities caused by patriarchal oppression requires more than the system autocorrection. Unchecked free market economy only promotes inequalities by concentrating wealth with the few. In the long run, inequalities promote destruction and destabilization in the system. Hence, consciously incorporating virtues of justice through inclusion and equality for girls and women in various intersections of life in measures and programs can enhance the capacities and capabilities of individuals and communities. Such structurally oriented and socially transforming means can increase the quality of life for those in the current generation while meeting the needs of those in the future through and achieve social justice. Denial of social justice and disregard to intergenerational justice will continue to lead the society towards diminished capital investment, less freedom to enjoy those investments and, in turn, further deplete the quality of life through degradation of the living ecological space and potential for wellbeing.

Freedom and Rights in Sustainability

Freedom of choices and rights have been discussed extensively throughout history and have been debated especially considering development approaches. Economic development without social or political development has been debated within the contexts of modernization and dependency theories in the past. Sustainable development defined by intergenerational justice with focus on needs and concerns for the poor of each generation as defined by the

Brundtland commission has also been criticized as limited in its proposed framework. Sen (2013) argues that sustaining freedom to live the way people like to and have reasons to value, beyond the needs, ensures a healthy development. A freedom-oriented view in sustainable development with crucial focus on freedoms that people have reason to value goes beyond mere fulfilment of needs and enhances the quality of life they envision.

Unlike the traditional social welfare theory, Sen (1999a) presented a set of inter related theme in relation to welfare economics in the capability approach. He argued for the inclusion of people's freedom or choices (Sen, 1999a) needs to be the central concept of any development. This school of thought favors the social choice model rather than free-market economic model in human development. Accordingly, the purpose of policies and evaluations, despite measured at national or community level, still should focus on what men and women can do and be. Importance should be given to enhancing the quality of life and remove obstacles so that they have more freedom to live the kind of life they have reason to value (Sen, 1999). Accordingly, human welfare and personal well-being does not depend on an individually acquired economic wealth (opulence) or satisfaction because of acquiring goods and services (utility). Any form of development must provide choices and opportunities to increase his/her well-being. Hence, freedoms and choices to utilize and/or maximize opportunities should be with the individual. In other words, ultimately, what is important for human well-being is having the freedom or capability to lead the life they value and can be attained even in the most impoverished of communities through enhancing social development and human capability where economic development is only the means (Sen, 2008). Therefore, the progress of development should be measured through what people can achieve and not through the structural ends far removed from human well-being (Sen, 1999a).

Within the context of women's rights, it can be summed up that, all too often, women are not treated as ends in their own rights, and persons with a dignity who deserves respect from, societies, laws, and institutions (Nussbaum, 2000). Their capabilities and functioning

have been compromised at all levels of the society. They are objectified as instruments to serve the ends of others as reproducers, workers, caregivers, sexual outlets, or an agents of a family's general prosperity (Nussbaum, 2000). Providing better access and rights to land and water can significantly improve the rights of women and improve their status in society. Hence applicable disaggregated measures based on inclusive policies weaved into all aspects of the sustainable development goals will provide a better understanding of who receives the resources

Furthermore, there's a danger in assuming universal approach to investment in capitals for development as presumed by broad set of provisional goals that align with classical utilitarianism approach or supply-side neoclassical approach when it comes to maximizing social welfare (Caputo & Cianni, 1997). These lines of thoughts promote market economy that discriminate some over others and assumes that those who are discriminated will contribute to the overall common good by increasing their productive capacity at some point (Caputo, 2002). Accordingly, oppression in the form of inequality and discriminations are an acceptable means of establishing priorities in policy making processes conducive to the social goods or utilities. In fact, expectations may be that those who endure the worst of such injustices have capable human potentials, yet they are victimized and eventually may meet some of the practical grounds or merits of their case by supporting the future generations (Caputo, 2002). This assumes that those who are discriminated, such as women and girls, at some point in their lives will invest in their future generations and the system will automatically correct itself. This practically advances public and private policies without considering social justice in the broadest possible sense, and instead relies on chances to make any advances or provides opportunities for the strongest. Disappointingly, such policies and programs, including the globalization of market, focuses on creating opportunities without equality and freedom into considerations. This has generated substantial gaps between those who have and those who

do not. Majority of the times, these types of policies and practices burden those who are most vulnerable, including women.

This is more apparent when we consider the fact that capital and asset-based approaches have made many gains within the different global developmental policies. Yet, attaining gender equality has continually been evasive despite the new policies. It is fair to say that previous capital investments have failed in converting to functionings for many women and girls. For example, as capabilities proponents would say, nutritional needs vary with age, ability, condition, occupation, and sex (Nussbaum, 2000; Sen, 1999). A pregnant or lactating mother has more nutritional needs than a non-pregnant woman; a growing child needs more protein than an adult, and elderly may need a different nutrition and proportion of food (Nussbaum, 2000; Sen, 1999). And if equality in access to nutrition is the goal, then more nutritious food needs to be provided to those who lack the most. But if the focus becomes just supplying nutritious food, such resource-only oriented approach without assessing the needs of individuals promote inequalities and better functionings (Nussbaum, 2000; Sen, 1999).

Additionally, choice or preference based approach alone can only promote inequalities for women. They tend to be systematically influenced by status, class, and other social conditions constructed within the patriarchal contexts (Nussbaum, 2000). Women have been left behind throughout their lives in many aspects of human capital, natural resources rights, and social engagement in society through social and cultural construct; hence, participating in political or public spheres may not be their social norms (Nussbaum, 2000). Investments in capitals are required for women to maximize their choices or rights. Freedom and liberty, in their virtues, are not just a matter of having rights on the paper, it requires all other conditions be conducive to maximize those rights and this requires investments in addressing issues that set girls and women behind in all aspects of life. Without mobilizing half of the population of the world and ensuring their freedom and rights to fair access of investment capitals, the goals for a sustainable development and intergenerational equality will simply be translated into

continued sets of similar goals to meet for yet another timeline. Neither capital regulations nor government and international interventions are likely to eradicate inequalities, and social or intergenerational justice goals may continue to make some impact but not sufficient to achieve the desired sustained equality and fair goals. Focusing on the entitlements of everyone to a decent minimum level of capabilities can provide insights into ways various governing bodies, institutions, civic societies, and individuals can take the responsibilities in facilitating to those entitlements. (Nussbaum, 2006).

Based on Nussbaum's capabilities and social justice framework, resources are only the means for achieving some valuable ways of being. Focus on equalizing resources alone, without paying attention to the social and physical environment within which resources are used to achieve valuable ways of being, is inadequate. Accordingly, only providing resources and not the capabilities, promote inequalities. For instance, if two women have access of equal wealth, but one lives where women are discriminated against in various aspects of life, while the other does not, although they have same resources, they do not have the same capabilities with respect to what they can do (Nussbaum, 2006). Therefore, regions where women can enjoy more economic, political, and social rights as well as environmental rights, they can maximize the full potential of the resources.

However, many aspects and cultures of society determine, influence and restrict, objectively and subjectively, a girls' or a women's aspirations to be who they want to be or what their choices are. These determinants define a complex and dynamic system in their social world, where continuous and discontinuous series of instantaneous equilibrium of cumulative capital interact to generated advantages and disadvantages. These interactions in turn influence how they speak, dress, access resources, or shape their social structures. In other words, social space is more than a simple system of ideological space and each space is context and time specific defined by cultures and traditions. Different groups living in such different social contexts and times with various internally and externally generated experiences

have experienced capital differently (Lin 2001; Niemen, et. al., 2008; ParksYancy, DiTomaso, and Post 2008). Understanding this requires revisiting the trajectories of capital related development along with social justice values of equality and freedom that I just explored.

In the next section, I explore various forms of capitals and how they have been applied within the context of sustainability, intergenerational equity, and gender equality.

The Capital Approach in Sustainable Gender Equality

It can be strongly argued that the key challenges of sustainable development have been the intersections, synergies, and trade-offs among its various dimensions (Lehtonen, 2004) along with maintaining the values and ethics imperative to humanity. The terminology, capital, initially, strongly associated with economic assets and wealth has been expanded and further refined into other aspects of spectrum to include human capital, built capital, political capital, natural capital, cultural capital, and the list keeps growing. However, despite these various forms of capital that underlie the social, economic and environment dimensions of sustainability, it needs to be kept in mind that they are only the means to a dynamic outcome of wellbeing for the individuals within that ecosystem.

Since poverty has been identified as the main ill of society, providing economic relief and promoting institutional democracy became the mainframe of development post World War II. Modernization through capital investments and measuring them in terms of economic capital defined that era. Neo-classical liberals promoted the free-market economy where all the gains and losses were measured in terms of economic assets. The economic capital theories place monetary costs and risks in accessing social and environment aspects of a substitution. At the core of this debate lies the maintenance and growth of capitals (Goodland, 2002). Hardi (2007) argued that neo-classical economists recently made a victory in terms of analyzing sustainable development goals in monetary terms. However, more often, economist focus on economic and leave equity to the political process. This is certainly not the goal and understood dynamics of sustainability. Without considerations of total welfare of dynamics with multi-sectoral approach,

sustainability can be a static linear process. Hence, some economists, broadly and normatively, have started to define sustainability as part of a dynamic efficiency that includes intragenerational and intergenerational equity (Stavins, Wagner, & Wagner, 2002). More closely associated with the neoclassical economies for potential Pareto improvements of leaving no one worse off, they make a case for inclusion of welfare capital, as well as including capital depreciation to minimize under or over estimation of dynamic efficiency. Accordingly, if the focus of sustainability is to avoid unnecessary degradation of resources and have a normative standing as a policy goal, then the dynamic efficiency is a necessary condition. Furthermore, Stavins, Wagner, & Wagner, (2002) emphasize the distinct flair of intergenerational concept calls for a maximized total welfare function which should not decrease over time to ensure the next generation benefits from it. They propose for an optimized consumption path, as the foundation for sustainability, with a call for efficiency as the priority for sustainable development where gender or intergenerational equity be dealt by social dimensions. However, shifting responsibility to other sectors make their proposal a development-as-usual. There clearly is an issue with this concept for girls and women around the world whose economic stock and flow are not as simple.

Furthermore, assessing SDGs, especially on gender goals through national prosperity does not tell us many social conditions women face in making economic gains. When policies and resources for socio-economic and land inheritance rights prevent women from maximizing their potentials, women will continue to be underrepresented in national accounts such as GDP and GNP. There needs to be specifications beyond distribution of wealth and income. They must include factors such as life; bodily health and integrity; freedom of thoughts, senses, and imaginations; physical and emotional wellbeing; right to associate; control over one's environment; and play to list among the few and various other opportunities, along with political liberties that assess the quality of life across societies (Nussbaum, 2000).

The dynamics in overlap between intrinsic values of what is just and right in accounting for gender and intergenerational equity, and the extrinsic value of pragmatic space where resources are exchanged can be further looked at through the lens of social capital. Apparently, modernization alone does not uplift the poor and hungry. A systematic discrimination and oppression leaves out many creating unparalleled inequality, especially in the developing world. If one was to ask what is to be distributed, to whom, and how, then that discussion must take place in a defined social space of natural and man-made wealth and exchanges, where cultures, norms, trusts and networks exist and interact. The contextualized space is a nest where all the capitals are housed in stocks and flows.

The physical ecosystem where the justice and rights are carried out by the people are not static environment but inclusive of networks, interactions, norms, trusts and resources. In the development literature, social capital has been shown to have important effects in regards to inequality outcomes in education, income, social mobility, social participation, health and well-being, civic engagement, and social solidarity (Coleman 1988; Field 2003; Lin 1999; Putnam 1993, 2000; Parks-Yancy, DiTomaso, and Post 2008; Carbajal, et. al. 2012). At the global and cross-country level, proponents of capital approach to sustainable development have been mostly in the practice and intervention realm of international development organizations, governments, and the civic societies in reducing poverty and other issues through different programs and projects carried out globally. Sociological approaches have addressed social capital as socialization of the economic concept of resources and capital (Lichterman 2006). Others suggest social capital focuses the attention away from the individual and toward social constructs without demoting the agency (i.e., individual activity) (Field 2003). Given the dynamics, social capital can be a strong link in steering communities towards a sustainable inclusive community.

Understanding the different theoretical approaches to social capital would be beneficial in using it within the gender equality framework. Generally, the concept of group in social

capital tends to be generalized to be of true to all groups of people and communities (Coleman 1988; Putnam 2000). However, others (Lin 2001; Niemen, Martelin, Koskinen, Simpura, Alanen, Harkanen, and Aromaa 2008; Parks-Yancy, DiTomaso, and Post 2008) suggest that different groups experience social capital in their own unique ways within their unique contexts. It is particularly true in the current context where communities thrive in dimensions beyond physical surroundings in virtual environment and technologies that connect people across the globe. However, within the gender equality and intergenerational contexts, despite the similar interest or culture of group members, social capital should ensure civic society and democratic participation of women.

Per Lehtonen (2004), while much has been discussed between environment and economics, the increasing attention has lately been paid to social sustainability, the interaction between the social with environmental dimensions still needs defining. Although integration of social and economic investments for development and growth became the focus of 20th century (Midgely & Tang, 2001), call for equitable environmental resource sharing and preservation for future generations was initiated with more rigor around the 1973. However, on the subject of sustainable development, some early commentators have been more critical of mixing together the moral ideas of justice and fairness along with the technical ideas of economics. The environmental ethicists debate on the two distinct aspects of its value: the *instrumental* and the *intrinsic* or non-instrumental (Brennan & Lo, 2015). Instrumental values are things that act as *means* to further some other ends, in the case of environment, this perspective looks at environment as a natural capital or assets that promote well-being or wealth of people for instance.

Whereas the intrinsic values are those things that are *ends in themselves* regardless of whether their utility as means to other's end or not. This school of thought considers it immoral for human beings to exploit the natural environment and destroy the flora and fauna of earth's natural diversity in resources for their personal gains. The criticism of Brundtland definition in

advocating of preservation of natural resources turns sour for those who may value the natural and the ecosystem requiring care. Environmental policy has been characterized by Sagoff (2004) as opposition between value that is instrumental and aesthetic, and moral in judgments and convictions. The non-anthropocentric environmental proponents have criticized the language of economics of environment as largely instrumental along with the implications this can have on the ecosystem. The critic lies mostly with the association of nature with assets, capitals and resources or systems that have been monetized.

Similar argument has been applied to girls and women. Women have been regarded as assets and belongings to barter between families as laborers or objects of sexual pleasures to exploit; they have been used as weapons of war in conflict ridden countries. The main criticism is in owning women and nature alike as means to some other objectives. Many environmental justice advocates separate the women and nature and have argued, for a policy approach to sustainability that considers the environment and natural things that are instrumental, yet intrinsic and something that needs preservations for its own and the systems' protection (Calicott, 2013).

Natural Capital and gender equality are intricately interconnected to poverty, population, the use of natural resources, and how policies addressing one without due attention to the others will fail. In 2001, his book *Human Well-Being and the Natural Environment* extended theories of wellbeing into the context of sustainable development. Dasgupta (2001) emphasized intergenerational well-being as relevant to measures for evaluating sustainable development. He contended that the rule for assessing this realization is whether wealth, including environmental and other non-priced assets, is non-decreasing. Accordingly, measurements of inclusive capital must incorporate not only the people, natural resource use and social capita, but also conventional constituents of well-being. Although some countries have been successful at accumulating a great amount of economic and social capital, they have lost natural capital on the other hand, by depleting non-renewable resources. Some of the

first inclusive wealth accounting of nations was generated by Dasgupta and his peers, analyzing 140 countries in a landmark 2014 report. While estimation of inclusive wealth is still at an early stage, the work has shown that environmental condition and natural resource assets are vital in national accounting of a country's progress and capital base. Without such comprehensive valuations, what we see as success today may only be a down payment on failure tomorrow.

Whether preserving the earth for itself and its beings or for the future generations, both require extending knowledge of sustainability and justice. Increasingly, the medium of knowledge transfer has been through education and technology. Proponents of social justice contend that more conscious efforts are needed to include underrepresented minorities and women on all aspects of life. For instance, National Science Foundation and Engineering Indicators (2016) show that even in a developed nation such as the United States, a strong disparity emerges between men and women in higher education and workforce related to Science, Technology, Engineering, and Mathematics (STEM). Neither market self-regulations nor government interventions can fairly address labor market discriminations. Social justice should be a part of an integrated system through policies such as affirmative actions to make a significant dent in the system. However, odds are worse in favor, globally, for the minorities and women where corrupt governments can have an upper hand to where even if policies are accepted, they are difficult to implement as fully recommended.

Enhancing the capabilities of women and girls to enjoy and live the life they want requires practical applications of equity policies that prevent systematic discriminations that exists pervasively in the public and private systems. This requires advocating for more structurally oriented and socially transforming means of programs and policies that inequalities (Gil, 1990 & 1998; Nussbaum, 1999; Saleebey, 1990; Sen, 1992). The lack of policies and programs that address education and employment opportunities, and access to physical and mental health services would lead to diminished human capital investments. These factors

lower income, discriminate in the job-hiring process, degrade natural environment, and decrease productive capacity of girls and women throughout their lives.

Based on the literature reviewed so far, it can be concluded that sustainable gender development matrix requires integration of economic, social, and environmental dimensions juxtaposed by a complex web of inclusion and social justice for girls and women. Hence, in the next section, I present a conceptual framework for sustainable gender equality. It considers equality, right, and capital investment as core aspects of the framework while keeping environmental and intergenerational justice perspective into considerations.

Chapter 3

The Conceptual Framework

Social justice on one hand and development on the other, has been the agenda that underwrite the development trajectories in the past decades. Integrating economic, social, and environmental dimension with goals of attaining girls' and women's equalities and rights have the potential to fully realize the current SDGs for gender equality and empowerment. This section proposes a framework that ties economic dimension (economic capital), social dimension (social capital and human capital), and environment dimension (natural and built capital) with gender equality goals as identified in the SDGs. It also explores measures that are currently missing in gender accountability within this new framework and place the role of women's rights at the center of it in promoting a sustainable gender justice.

Women and girls, all too often, are not treated as ends in their own rights and as persons with dignity who deserves respect from laws and institutions (Nussbaum, 2000a). Accordingly, a girl child's maternal family, in most parts of the world, frequently treats her as dispensable seeing that she will leave for her marital home and will not support parents in their old age (Nussbaum, 2000a). Investment in her human capital of good health and education is considered wastage of resources. After she is married, she is most likely to be a simple mean of reproduction and an additional contributor to household or land work. A woman is then most vulnerable to abuse, have least say in the household decision makings, will give up her food for the family, and in the case of widowhood, may lose or not have her property rights. Furthermore, social, and cultural norms of objectifying women as expendables continue to follow them into old age. Vulnerabilities associated with being born a female has many consequences throughout the life-cycle (Remis, 2016). Health and education compromises compared to boys and men, early marriages and child-birth, hard labor, poor nutrition, and house chores impact women in substantive ways, particularly more if economic transitions or food insecurity issues are concerned (Robinson & Remis, 2015).

However, studies have shown that investing in different aspects of capital can have productive outcome for women and their families. Ensuring their rights, empowering them, and promoting their good health can help women close the gender inequality gap. Based on the capital model, there are many factors that promote or demote an agency. Investment in resources, people, their network to the broader society and participation in all levels of decision making can enhance their wellbeing and human development.

In general, as economy grows, men and women both benefit from it and economic capital has the potential to reduce absolute poverty. It has been theorized that increase in resources, decrease competition for them. Access to wealth creates opportunities and can reduce gender gap. Women have the potential to convert it into many different aspects of life. For instance, a country's GDP has been highly associated with Maternal Mortality Rate (MMR) and Adolescent Fertility Rate (AFR) (Permanyer, 2015). Contrary to Malthusian dynamic growth process model that proposed death rates reduction and increase in fertility during economic growth, trends have shown otherwise. (Becker, Murphy, & Tamura, 1994). Improvement in economy has been associated with decreased fertility and has many positive effects in a woman's life. Accordingly, true of developed western countries, over the last 150 years, increase in economic growth has been associated with decreased fertility rate, and improved investment in education and health. Furthermore, higher GDP has been shown to improve economic status while increasing the likelihood of investing in girls' education. Furthermore, wealth is a necessity, and argument can be made, where, if health care was privately provisioned, lack of wealth can be the severely restricting factor. Hence, as economic capital and investment increases, it is expected that gender gap decreases in terms of health, education, and thus, labor force participations.

Additionally, investments to promote economic benefits appear to be at the core of the original human capital theory (Becker, 1994). Better education promotes employment likelihood and healthier economic activity keeps unemployment rate lower. Furthermore, investing in

health and education for women and girls will have returns beyond the scope of current generations. More recently, human capital has been defined in terms of measure in wealth, as the stock of economic productivity of human capabilities. Human capital has been regarded as an individual's acquired knowledge, skills, competencies, and attributes that promote personal, economic, and social well-being (OECD, 2001). Today, the economic importance of knowledge and skills is widely recognized both within labor economics, growth theory, business economics, as well as scientific and technical communities. Studies have indicated that an additional year of schooling is highly associated with 5 to 15 per cent higher earnings on average, although variations exist among different nations (Knowles, Lorgelly, & Owen, 2002). Also, 1 percent increase in level of education for women generates .3 percent additional economic growth (Knowles, Lorgelly, & Owen, 2002).

However, relying on market mechanisms or transactions alone in their own accord can create a biased stock of human capital within a country's productive capacity and create gaps. For instance, if women and girls are systematically discriminated, the productive capacity of the country will be lopsided to favor men. Global data show that countries with better investment in gender parity for education tend to be more developed than those countries without (World Bank Group, 2016). Also, when women and girls are trained, educated and are healthy, may invest more on their future generations. For instance, each additional year of education for female reduces child mortality rate by 18 per 1000 (The World Bank Group, 2016). While, completing primary education can prevent at least 7 million new cases of HIV (Global Campaign for Education, 2004).

Improvement in resources have helped advance health human capital which allows for improved development. More importantly, increase in health capacity and advances in healthy human capital, improves income and livelihoods. It is the major sustaining source of human capital with productive returns for now and into the future. Particularly, investment in women and girls' health can have significant impact on national output that impacts all other capital.

For instance, investing in girls' education not only have returns in income and growth, but it also has returns for health, HIV/AIDS prevention, empowering of women, and prevention of violence against women (Sperling, 2004). All these factors considered, human capital has the potential to improve wellbeing and decrease gender inequality gaps.

Furthermore, social capital as explored earlier in the literature has the potential to impact development and reduce disparities. Bourdieu (1986) defined network as an individual asset that focuses on the benefits accrued to individuals by virtue of participation in groups. Coleman (1988 & 1990) focused on the more collective characteristics of networks, emphasizing social capital as collective advantages derived from social interactions. Putnam further added to the discussion of network and participation as cooperation and mutually supportive relations in communities and nations that contribute towards the development of democratic institutions (Putnam et al., 1993). Overall, the two significant aspects, network and promotion, have been linked to increased sociopolitical and community participations and promote social development (Carbajal et. al., 2012).

In regards to citizens' sociopolitical role in community participation, social network is a key element in accessing common resources [for women], as well as facilitate democratic citizen participation resulting in community prosperity (Krishna, 2002). Almond and Verba (1963) first associated importance of citizens' involvement in democratic attitudes and civic associations for politically active and informed roles in a society. By voluntarily participating in associational activities, citizens learn different skills of democratic discussions, understandings, and practices leading them to cultivate positive attitudes toward democracy (Carbajal, et al., 2012). Furthermore, participation in associational activities promotes opportunities for women to interact with other citizens and facilitate access to information, resources, and networks (Lee & Glasure, 2007). Higher political representation can create opportunities for women to address the social and structural issues in all spheres of their lives. This, in turn, further strengthens the democratic process for gender equality. A study assessing 65 societies with 80 percent of the

world's population reported that countries that rank higher in civil rights and political liberties have higher proportion of women in the parliament (Inglehart, Norris, Welzel, 2004). Democratic representation promotes women's interests and make their voices heard (UN, 2016). Functioning democracies and freedom to exercise rights and equality require literate citizens and educated leaders that are men and women. Research has shown that non-democratic governments often restrict their education system (Sokoloff & Engerman, 2000). As presented earlier, education in turn promotes equality for girls and women for generations to come and as a result have the potential to reduce gender inequality gap.

Other than economic and social capital, natural capital is a key part of the ecosystem subsistence to many who rely on it for their daily survival. Farmers, particularly in rural areas of low-income countries, directly depend on land and water for their subsistence. If these resources deplete, they are at higher risk for malnourishment, and subsequently forced displacements if conditions become chronic. A measure of number of tons of grain produced for each hectare of farmland reveals that, the yields are roughly one-third of what they should be in Africa in the recent years (Sachs, 2008). This type of deficit occurs because farmers lack access to natural capitals as well as other related capitals such as finance, market for fertilizer, the high-yield seed generated through sustainable farming techniques, and other inputs that they need for production (Sachs, 2008). This is particularly true for women, since they usually do not have the right to their land and must depend on their husbands for decision makings. Lack of access to quality land and easier access to water for women are at the heart of food provision for their families. In addition to being responsible for securing and preparing food, girls and women often make significant contributions to their families' production of essential crops (UNEP, 2007). In sub-Saharan Africa, although men are also part of the agricultural process, women contribute 60 to 80 percent of the labor for food production in the household consumption and sale (UNEP, 2007). Men are usually considered the rightful heir to the land passed on through generations and women are only laborers in them. Furthermore, both

generally face the similar external constraints, however, women compared to men have unequal access to agricultural knowledge, technologies, support services and credit (UNEP, 2007).

Growing body of evidence show that empowering women in all aspects of life including agriculture and welfare, while closing the inequality gap, can lead to improved children's nutrition and reduced mortality (Chowdhury, et. al., 2013; Smith, Khan, Frankenberger, Wadud, 2013; Duflo, 2012); increased school enrollment (Chowdhury, et.al. 2013; Giroux, Elounddou-Enyegue, 2013; Smith, et.al., 2013; Duflo, 2012); improved maternal and child's health (Chowdhury, et. al., 2013; Abuya, Ciera, Kimani-Murage, 2012; Black, et. al., 2008;), and improved natural resource management (Coleman & Mwangi, 2013; Westermann, Ashby, Pretty, 2005; Juma, 1998). These factors, associated with the environment and natural capital can have greater impact in decreasing the gender inequality gap from early childhood.

Along with the natural environment, built environment has increasingly impacted development. Conscious inclusion and accountability for women and girls in programs and projects that impact the physical and digital infrastructure can go a long way in sustaining gender equality. Built capitals are the foundation of a community network that function as the delivery system in sustaining the infrastructure investment. These capitals have become the bridge at the core of determining ways other capitals can be used. For instance, digital technology is revolutionizing nations, institutions, and communities through its own unique culture by changing ways society operates, empower individuals, topple government systems, and promote participation in and contribute towards decision-making process at all levels of society. Built capital promote other capitals to function effectively through networks and include indicators such as banking, trades, mobile phones, or internet services that promote and maximize economic, social, and political potentials.

GSMA (2016) reported that only 60 percent of people in the developing world will have an internet connection by 2020. It is a powerful tool for economic, political, social, human, and

natural capital. Like mobile phone access, having an internet will also mean women can participate in employment, maintain bank account and gain education in remote parts of the developing world. Technology have become crucial for many women around the globe who are either not in formal employment or their informal employment are not accounted for. Maintaining her own financial account at a bank, a woman can manage her own money and accumulate savings and assets.

Furthermore, improving physical infrastructures like piped water system, roads, and electricity have been known to improve development (Putnam, 2004). While not having access can increase the gender gap. For instance, Udas, Roth, & Zwarteveen, (2014) reported lack of water delivery system or informal privatization lets communities in urban areas continue to cut off many families from accessing community tap water, a process shaped by power relations and cultural differences along the access of gender, caste, and wealth. Further, in an ethnographic study conducted in five communities in Mozambique, concluded that collection of water is related to the status of being a good mother or wife and shapes the role of a woman in a community (Van Houweling, 2016). Gender roles and intersectionality further complicates the social dimensions of access to resources and who controls them. Case studies from Sudan and Bangladesh reported water and ecological processes deeply intertwined with the intersection of a woman's status (Thompson, 2016). These and many more empirical studies continue to emphasize that women's role and their status in society are tied to natural resources and better infrastructures such as piped water system can greatly enhance the agency.

Counting Girls and Women in Measures

As shown by compelling evidences, mobilizing resources, networks, human potential, participation and investing in girls and women can have many benefits to the society. Amid all these investments, attaining sustainable gender equality has been one of the most controversial and illusive great social ideals. Despite many attempts at advocacy and global

intervention strategies, alarm for gender inequality continues to come through strong in subsequent sets of global interventions, leading up to the current SDGs. From the call for justice by Marie-Jean-Antoine-Nicolas de Caritat, Marquis de Condorcet (September 17, 1743–March 28, 1794) of the Enlightenment era; the suffrage movement beginning mid 1800s; the struggles for bodily rights in the 1970s to current call for global equality, generations have passed by and struggles continue for girls and women's rights for good health, education, right to vote, equal pay, right to make decisions and be counted in labor force participation. Apparently, through generations, gender equality has been successfully evasive, or rather gender inequality has been the persistent negative sustainability. Closely assessed, it is linked with more than morality and justice in general, and is an issue of distribution. At the core of patriarchy is the distribution of power dynamics that decides who gets what. Until equity is achieved in such matters, gender equality will continue to be unsustainable despite all the investments.

Therefore, of utmost importance is the need for some reconsiderations going forward in attaining sustainable gender justice. It needs reevaluating the way gender inequality has been measured in the past. A measure for sustainable gender equality requires accounting for social, economic, and environmental dimensions, for a girl child, adolescent, and women of different generations. In other words, based on the construct for fairness, equity for environmental, intergenerational justice and gender justice must be kept into considerations in measuring equality outcomes for gender. In 1995, post Beijing conference, a commitment to measure gender equality launched the first set of composite indices: Gender-related Development Index (GDI) and the Gender Empowerment Index (GEM), to reflect gender disparities at the global level (Permanyer, 2015). However, critiques were quick to point out the lack of equity considerations for women in GDI, which ignored the measures that had more weight for women in life; while both GEM and GDI penalized men score as well as included estimated earned income. The latter is considered problematic since many women were not

part of the formal labor force. To overcome some of the issues related to gender equality measures, Gender Inequality Index (GII) was launched in 2010. Currently, the main index to assess gender equality is the GII, and among other criticisms (Klasen & Schler, 2011; Bericat, 2011; Beneria & Permanyer, 2010; Permanyer 2008; Hausmann, Tyson & Zahidi, 2007; Unterhalter 2006; Morrisson & Jütting, 2005; Jütting, Morrisson, Dayton-Johnson, & Drechsler, 2008; Branisa, n Klasen & Ziegler, 2009), it fails to account for intergenerational gender inequality and other sustainability measures identified by the SDGs.

The GII measures gender inequality gaps and has three dimensions that capture empowerment, economic, and reproductive health related measures. It assesses adolescents and women identifiers, namely, education attainment, parliamentary representation, formal labor force participation, the maternal mortality rate (MMR), and the adolescent fertility rate (AFR) for 138 countries at national aggregate level data (Permanyer, 2015). It is designed to reveal the extent of national achievements in those dimensions of human development based on gender inequality and provides numerical measure for policy and advocacy efforts. The index reflects on loss of human development due to inequality between female and male achievements. A score of 0 indicates that women and men equal, while a score of 1 indicates poor faring for women as compared to men (Permanyer, 2015).

Within the reproductive health measures, MMR and AFR measure the degree to which a priority is given to the well-being of women during childbirth (Oxford Poverty Human Development Initiative & United Nations Development Program [OPHI & UNDP], 2011). Accordingly, it depicts women's status in society. Providing proper healthcare, education, access to contraceptives, antenatal care and skilled attendance at birth can prevent millions of deaths during childbirth can be avoided worldwide (OPHI & UNDP, 2011). Additionally, early childbearing prevents young women from maximizing their human capital necessary for success in the labor market or accessing other life opportunities (OPHI & UNDP, 2011).

Next, the empowerment dimension measures share of parliamentary seats held by each sex and percent of adult male and females aged 25 years and older with secondary and higher education attainment levels. Women have traditionally been left behind in education and parliamentary representations in many parts of the developing world. This measure, although criticized for its elitist measure of parliament representations, reflects women's visibility in leadership and their capacity to hold high offices (OPHI & UNDP, 2011). While higher educational attainment reflects women's ability to expand her attainment to other spheres of her life.

Finally, the economic dimension represents labor force participation rates and is measured by women's participation in the work force. It "reflects both a person's willingness to work and perceptions about work opportunities available and ability to combine productive work with reproductive responsibilities" (OPHI & UNDP, 2011; p. 7).

Among other factors that are unaccounted for (time use, assets, control of productive resources, gender based violence, human trafficking, and leadership on the aspects of life), it fails to incorporate environmental dimension into consideration. Furthermore, it fails to capture these dimensions for men and women in different generations. Adjusted Measure for sustainable gender equality should consider other factors that influence different generations in the household as well as environmental involvement in gender dynamics.

The Missing Dimensions in Current GII

Environment and Food Security. Global food security for men and women, whether they are young or old and reside in developing or developed world provide vital subsistence for survival. As food producers, protecting the environment for current and future generations while providing food security and nourishment, is a moral imperative for all. Maintaining arable land, quality water resources for effective farming systems for improved food production while reducing carbon emission for a sustainable natural environment, form the basis for quality of life and the living ecological systems. Furthermore, gender equality contributes towards better

distribution of food in addition to food security for the family. Women and girls globally face many inequities and constraints in the forms of norms and practices encoded in legal provisions or lack thereof due to laws favoring boys and men. Intergenerational transfers in inheritance and access to land are integrated in the system through inequitable and exclusionary cultures, traditions and legal provisions, thus institutionalizing discrimination (Asian Development Bank [ADB], 2013). An estimated 60% of women and girls are undernourished around the world (United Nations Economic and Social Council [ECOSOC] 2007; World Food Programme [WFP] 2009). Places where legislative measures to protect the rights of girls and women are not in place, customary rules and practices often restrict women, limiting their access to land and credit in turn impacting household food security and critical nutrition. Adequate nutrition provides better physical health and cognitive development. When women and girls suffer food insecurity directly, other members of their households are also impacted inter- and intra-generationally. For instance, lack of nutrition limits their full potential to actualize educational and economic aspirations and has adverse effects in the power dynamics within the family structure. This weakened bargaining position translates into lack of household decision makings, differential feeding and caregiving practices that favor boys and men, promote food and nutrition insecurity, and overall lower health and nutritional outcomes for her children (ADB, 2013). Additionally, women in a community with greater restrictions, particularly in rural areas, on access to forest resources tend to have more dependents, reduced market integration, and low body-mass index (BMI) relative to younger women in the population (Jost Robinson & Remis, 2015).

Food security and nutrition of women and girls are intricately linked to other current measures of GII. A cross-national longitudinal study of developing countries from 1970 to 1995 found 43% of the reduction of hunger was attributable to progress in women's education. This has been translated into combined effects of hunger reduction through increased food availability by 26% and improvements in health environment by 19% during that period (Smith

and Haddad 2000). Additional 12% of the hunger reduction was attributable to increased life expectancy of women. Global comparisons have shown that countries ranking highest on global hunger index also have highest inequalities (von Grebmer et al. 2009). And other studies have shown that women's education and decision making have positive association with health outcomes for children in height, weight, or immunization (Pitt, Khandker, Chowdhury, & Millimet, 2003; Duflo 2003; Quisumbing and Maluccio 2003).

With nourishment comes protecting and nurturing the land and surrounding natural habitat to sustain adequate and nutritious food supply. Food security is directly tied to the climate and natural capital. Healthy land and abundant fresh water ensure quality of food production. While dispersion of toxic chemicals through poor air quality, drought disturb the food chain, acidifies oceans, and depletes fish stocks and biodiversity. These environmental factors are intricately related to the food chain. For instance, by 2050, a drop in 14% of rice production, 49% drop in wheat production and 9% drop in maize production due to climate change in South Asia (Nelson et al., 2009). Overall, child malnutrition could increase by 20% due to climate effect and associated developments (Nelson et al. 2009). These severely impact women and girls since higher proportion of women are small-scale food producers while they maintain unequal bargaining power within their households. Hence, incorporating an environmental dimension that captures agriculture and climate that impact at all levels of gender dynamics is crucial in the measure that captures sustainable gender equality.

Informal Labor Participation. Women who are involved in informal labor or startup businesses like the ones funded by microfinance programs, particularly in rural areas where women manage small loans for their businesses. These small efforts are another way to raise women's status, empower her, and improve her ability to provide for herself and her families. An intervention project in Ghana, for example, used an innovative health program to combine health education with access to microfinance that also required that women operate their own bank account. Women received village banking services and access to loans, along with

maternal and child health education. Assessment conducted three years after the program concluded that the children of participants were healthier and better nourished than those of nonparticipants' (World Bank, 2002). Recent study conducted by Mitschke, Aguirre, & Sharma, (2013) on financial education and refugee mental health showed that financial understandings can have significant impact on psychological wellbeing for women.

Empowerment in Technology. Women can use mobile phone to access knowledge, receive health benefits, protect their crops, enroll their children in school, and participate in civic engagement and social networks, banking etc. It enhances the use of enabling technology to promote the empowerment of women as stated in the sub goal 5.b in SDG #5.

For instance, mobile banking, originally designed to support loan payment system for microfinance loan, has managed to reduce cost and risks associated with handling cash; this has become the staple of many developing low and middle income countries like Bangladesh and Kenya (Kappler, 2016). For many people around the globe, especially women, in developing nations, a mobile phone can provide financial independence, employment opportunity, maximize human capital through knowledge, access to health and education, and internet (Kappler, 2016). Many of these women, especially in the rural areas can receive agricultural and weather updates, or they can simply be part of the friends, family, and community network that are known to facilitate different aspects of opportunities, innovations, and knowledge. Owning a mobile phone also gives women the ability to conduct business from remote villages, without having to commute long distance or manage their banking activities without leaving their homes or losing work hours. They can receive valuable reproductive health care and register their child birth or register their children to school using mobile technologies (Kappler, 2016).

But the benefit of owning mobile phone is inaccessible to 1.7 billion women in developing countries (Kappler, 2016). According to the GSMA, an association representing mobile operators for women worldwide, women are 14 percent less likely than men to own a

mobile phone (GSMA, 2016). In fact, by closing this gender gap in mobile phone ownership, women themselves will become a major contributor to mobile financial market while enhancing and empowering their own lives. Accordingly, their usage of mobile phone could contribute an estimated \$170 billion to the market economy in the mobile industry by the year 2020 (GSMA, 2016). However, access of mobile phone for many women in South Asia is even worse, where women compared to men, on average are 38 percent less likely to own a mobile phone (Kappler, 2016).

These proposed measures also, complement the GII by overlapping their scope of empowerment and equality for women. For instance, having food security, empowered by managing own wealth and assets and using technology can also empower women against domestic violence and human trafficking. See Table 1.1 for more specifics on measuring SDG 5 and ways proposed measure can complement it.

Considerations for Intergenerational Justice. Furthermore, considering generations is the key in sustainable gender equality. Hobbes expounded that if there were no mechanisms for enforcing justice or even if there were, but are corrupted, then those who act justly are at the mercy of those who are unjust (Oakeshott, 1962). This is a profound statement that brings forth the moral responsibility of fairness towards those who are vulnerable now as well as those of the future generations [girls and women in this study]. This can be extrapolated further as, those living now are in some ways dealing with the decisions and actions taken by those in the past, and future generations are at the mercy of current generations and their decisions and actions. Hence, establishing frameworks and measures to value women's and girls' wellbeing and development equally, compared to their male counterpart, will ensure we understand the magnitude and dimension of inequality for accountable interventions through generations.

Although, establishing justice of circumstances as a moral duty for everyone, sustaining it ubiquitously, simultaneously, or futuristically, is beyond any given individual's capacities. A basic order guaranteeing just circumstances must be created with reliance on

collective actions based upon sound and just capital (Gosseries, 2008). This is an essential argument of intergenerational justice in favor of establishing institutions where individuals can collectively fulfill their responsibility to transfer capital, in its broadest sense, which is greater than the one they inherited from the previous generations in the best possible manner (Gosseries, 2008). In such circumstances, where conditions prove to be unjust, everyone has the responsibility and moral duty to ensure that distributive justice is done. Yet, criticism remains valid when those who are struggling to meet their ends in their current life will raise the question of meeting the ends for future generations, when the guarantee to survive is minimal for them now. There would be something distinctly odd if the deep concern for the well-being of future generations who are not even born yet, while ignoring the plight of the poor today (Anand & Sen, 2000). However, intra-, and intergenerational sustenance can and should be the priority by individuals and the collective within a temporal space. They can be evaluated within a visible time lapse represented by needs of those in different age groups, separated by generations.

Hence, the proposed measure should account for men and women in social [empowerment (political participation, education, and innovation) and health indicators]; economic (formal and informal labor force participation), and an aspect of environmental dimension that represents generations. Furthermore, if there are certain investments made at macro level, there needs to be an outcome for sustainable gender equality. In other words, if there are investments in economic, human, social, natural, and built capital, then these should promote gender equality and reduce the gender gap. The following table 1.1 lists the sub goals related to gender equality and empowerment for SDG goal 5 and proposed measures using currently available data:

Table 1-1: Goal 5: Achieve gender equality and empower all women and girls and
proposal to measure them based on the availability of the data.

Sec	Sub-goal	Measures to include in IGE (in addition to GII)
5.1	End all forms of discrimination against all women and girls everywhere	Education (GII)
5.2	Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation	Data constraints
5.3	Eliminate all harmful practices, such as child, early and forced marriage female genital mutilation	(Adolescent fertility Rate) (GII)/ data constraint
5.4	Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	Mobile phone and banking (associated with microenterprise and informal labor related indicator (mobile phone and banking)
5.5	Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life	Female and male shares of parliamentary seats (included in GII)/ data constraints
5.6	Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences	Maternal Mortality Ratio (MMR) Adolescent Mortality Ratio (AMR) (included in GII)
5.a	Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance, and natural resources, in accordance with national laws	Female and male labor force participation (included in GII) Account at a financial institution, male and female (% age 15 and over) Nourishment (associated with land, property, inheritance and natural resources)

Table 1.1: *Continued*

Sec	Sub-goal	Measures to include in IGE (in addition to GII)
5.b	Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	Mobile phone use-by sex / Percent mobile phone use
5.c	Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels	Data constraints

So far, this section proposed that investment in capital and resources have good outcomes for women and that these outcomes should have some measurable properties. Next section explores the effect of women's rights can have on channeling investments made at national level towards sustainable gender equality outcome.

The Importance of Women's Rights. As earlier stated, investment in girls and women have successful returns. However, inclusion is not sufficient, equality as outcome should be the focus. For instance, educational enrollment for girls significantly improved, in fact more than boys in the last evaluation from MDGs (2015); however, attendance continues to be low as girls are the most likely to miss schools if household duties require extra hands (Nussbaum, 2000). Although individuals are responsible for their own actions and decisions, a failure to correct unjust circumstances that have been a part of structural and systematic discrimination requires urgent focus. In this regard, we can say that injustice to future by continuing to exploit vulnerable people like girls, as well as, environmental resources in the name of economic development needs to be addressed by investments in policies and infrastructures that promote women's rights. Research has consistently affirmed that investing in women is transferable. Promoting women's rights have been considered instrumental in achieving good governance and improved economic development for herself and her children (Coleman 2004; Neumayer & De Soysa 2007).

Moreover, exclusion of women in decision making process for intra- and inter-generational policies and practices is ludicrous. Women are the key to ensuring continuation of generations as child bearers. Their role has been in nurturing the next generation by more than just reproductive contributions. They play a crucial and continued sustaining role of taking care of their families and their surroundings through passing on their beliefs, cultures, and attitudes. However, if women are less educated, less well nourished, and more vulnerable, they are less likely to protect their offspring (Nussbaum, 2000) and their ecological surroundings. Lack of education and decision making renders women less likely to participate in political and personal decision makings. They are less likely to vote, less likely to run for political office, less likely to hold elected and appointed government positions, less likely to join political parties and the right to petition government officials (Sen, 1999; Nussbaum, 2000).

This lack of political participation further translates into less property rights, less ability to make a contract, associations, [networks to mobilize resources] and make decisions on mobility, and liberty (Nussbaum, 1999). Less property rights endangers her ability to provide nourishment for her children and less associations keep her away from civic and political participation and mobilize social capital effectively. Sustained depletion of women's status in a society [negative sustainability of rights] over time has been mainly been due to diminished say in how the nurturing of her child is to take place, or the power of child bearing decision itself has been given solely to men (Nussbaum, 1999). In other words, this lack of say is transferred to other realms of her life as well as of her children's lives, including decisions related to education, land or property, food, social engagement, or economic opportunities and becomes pervasive throughout a female's life course which then can be passed on to the next generation. Hence, despite investments in economic, social, natural, human or built capital at macro level, without women's rights in economic, social, political and land rights render them ineffective in covering the gender gap.

Capital, with its resources, human potentials, networks and participations, approach to sustainability manifests it in a given “space” as economic, social and environmental pursuit of economic security and social justice in a democratic institution. To reiterate, sustainability is a multi-scale, multi-sectoral, and multi-temporal construct that continuously interact amongst each other promoting a dynamic system of continuous change in a contextual space and time. More importantly from a transitional perspective, sustainability, and sustainable gender development for that matter, should be guided by the moral principle of social justice (Hardi, 2007; Parris & Kates, 2003; Pezzey, 1992). Equitable distribution and access of policies and resources, health and education, technology, and effective utilization of networks in a healthy democracy will ensure sustainable gender equality within that context. Yet, even more effective ways to promote these capitals to attain equality is promotion of women’s social, political, economic, and environmental rights.

Given the literatures and conceptual understandings, this study proposes to test an intergenerational justice perspective for a sustainable gender equality framework presented in Figure 1.1 with the following set of proposed hypotheses:

Hypothesis 1: As economic capital improves, sustainability adjusted gender gap decreases.

Hypothesis 2: As natural capital improves, sustainability adjusted gender inequality decreases.

Hypothesis 3: As human capital improves, sustainability adjusted gender inequality decreases.

Hypothesis 4: As built capital improves, sustainability adjusted gender inequality decreases.

Hypothesis 5: As social capital improves, sustainability adjusted gender inequality decreases.

Hypothesis 6: Women's rights moderate the effects of capital and sustainability adjusted gender inequality.

It also proposes to test the proposed conceptual model for goodness of fit by using exploratory factor analysis and the structural equational modeling techniques.

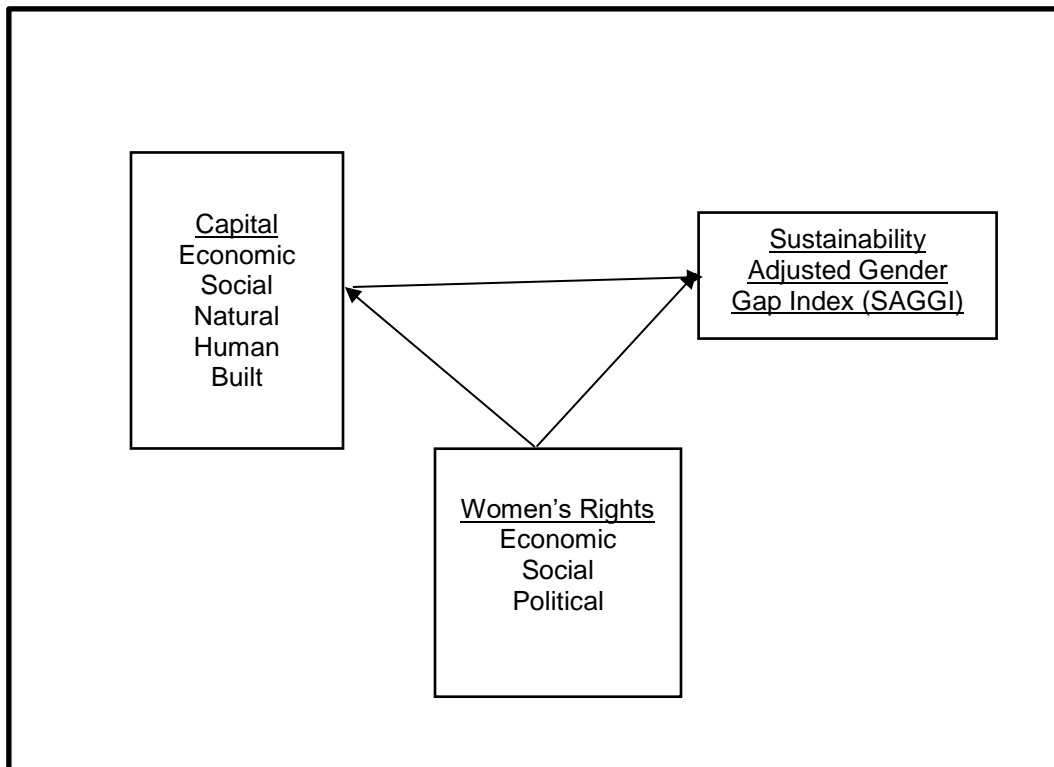


Figure 1-1: Sustainable Gender Equality framework

From the Brundtland perspective, this framework proposes sustainable gender equality framework. It incorporates a multi-sectoral, multidisciplinary collaboration and more importantly, a collective conscience for the moral responsibility to promote a more socially, politically, and environmentally fair world for girls and women now and those into the future. The challenge for intergenerational justice adds to the list of declaration of rights to include the fundamental human right to an environment that sustains their health and wellbeing (WCED, 1987). By including factors associated with different generations of women and children in the gender gap measure, it argues for equality for girl child, girls, and women, and acknowledges reciprocal exchanges and joint responsibilities to maintain such rights. To make this shared rights a reality, a space for social exchange of healthy networks of bridges and bonding needs to be in facilitation to maximize all other stock and flows of capitals, i.e., economic and natural resources, democratic and civic participation, and technologies and networks. More

importantly, sustainable approach to sustainable gender equality framework, with environmental, social, and economic betterment, is an interventionist perspective that requires actions on the part of men and women to ensure women's rights.

Following sections presented in this study focuses on testing the proposed sets of hypotheses and the theoretical model. It uses quantitative cross-national data for this purpose using GII sample for the year 2014 and associated indicators.

Chapter 4

Methodology

This section addresses the methods to be used to test the proposed theoretical model and hypotheses in the study. The study adopted quantitative approach to evaluate the state of concepts such as freedom and equality within the sustainable intergenerational gender equality framework using cross-country data. It is the first study of this kind to the author's knowledge. Following will be addressed in this section to carry out the proposed methods: unit of analysis and data, data sources, type of measures, type of analysis, models to be used to test the theoretical framework, and sample size.

The Unit of Analysis and Sample

The current study uses aggregated cross-national secondary data collected for the year 2010 by different institutions [i.e. World Bank (2016) and CIRI Human Rights dataset (Cingranelli, Richards, & Clay, 2014) on women's rights]. Sample size for this study is (N=155) countries for which the Gender Inequality Index is available for the year 2014 (See Table 2.1 for the list of countries).

Table 2-1: List of countries included in this study for analysis

Regions	Country Names
Low human development	Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo (Democratic Republic of), Côte d'Ivoire, Ethiopia, Gambia, Kenya, Lesotho, Liberia, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania (United Republic of), Togo, Uganda, Zimbabwe, Afghanistan, Nepal, Pakistan, Yemen, Haiti, Myanmar, Papua New Guinea
Medium human development	Botswana, Gabon, Ghana, Namibia, South Africa, Zambia, Bangladesh, Bhutan, India, Egypt, Iraq, Morocco, Syrian Arab, Republic of Bolivia, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Paraguay, Kyrgyzstan, Moldova (Republic of), Tajikistan, Cambodia, Indonesia, Philippines, Vietnam

Table 2.1: *Continued*

Regions	Country Names
High human development	Mauritius, Maldives, Sri Lanka, Algeria, Iran (Islamic Republic of), Jordan, Lebanon, Libya, Oman, Tunisia, Turkey, Bahamas, Barbados, Belize, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Jamaica, Mexico, Panama, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic), Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Romania, Russian Federation, Serbia, Former Yugoslav Republic of Macedon, Ukraine, China, Fiji, Malaysia, Mongolia, Samoa, Thailand, Tonga
Very high human development	Canada, United States, Bahrain, Israel, Kuwait, Malta, Qatar, Saudi Arabia, United Arab Emirates, Argentina, Chile, Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxemburg, Montenegro, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Australia, Japan, Republic of Korea, New Zealand, Singapore

Countries from developing regions are taken as core unit of analysis. Interpreting aggregate data at such macro level has its many criticisms. One being the use of cross-cultural norms as benchmarks for the world's diverse societies which ends up losing respect for individual's and [their culture] and freedom as agents and their role as democratic citizens (Nussbaum, 2000). People are self-deciding individuals who understand their own good and their decision to choose should not be taken away by aggregated and standardized indicators representing their individual needs (Nussbaum, 2006). However, such analysis does promote decision making on policies that promote human rights at the global level. The approach used in this study is much concerned with the opportunities women must take to improve the well-being and quality of their lives. Hence, although countries and regions are discussed, the essential focus is on human agency. This study recognizes the crucial role of social opportunities to expand the realm of human agency and the freedom, both as an end and

means to further their freedom. The study views individuals in countries and their opportunities in interactive terms in a shared space (earth/place) within countries and regions and uses the concepts of freedom and human agency while proposing for a sustainable gender justice framework.

Hence, keeping the ethical individualism in perspective, the claims about who or what should count in at cross-national level and decision-making based on any analysis or inferences presented here is concerned with individuals as part of the moral concern (Sen, 1990). When understanding different states of social, economic, and environmental affairs, the focus should be on the effect of those on the state of individuals directly and indirectly. Recognizing that economic, social, and environmental factors influence them needs will be kept into considerations when interpreting the current data analysis.

Data Source

The secondary data used for this study are readily available open source data collected for multitude of purposes for policy and practice decisions by World Bank, United Nations, World Health Organization (WHO) and CIRI Human Rights (See Table 2.1). The World Bank data is collected through complex surveys using large nation-wide probability samples of people employing strategies such as cluster sampling or stratification of population (Heeringa, West, & Berglund, 2010). Despite the challenges in enabling inferences about population characteristics or relationships between variables of interest extracted from diverse complex designs, it instills statistical rigor that account for the effects of complex sampling and use of same unit of data analysis (Sakshaug, & West, 2014). Given that, this is the method used by institutions to make decisions on policy and practices for the countries, this study follows the similar method while keeping the limitations in perspective. The other dataset is CIRI Human Rights Dataset. It is standardized-based quantitatively collected information from 15 internationally recognized human rights issues for 202 countries (Cingranelli, Richards, &

Clay, 2014). It has been coded annually from 1981-2011 and is designed for use by scholars and students who are interested in gathering knowledge about the causes and consequences of human rights violations. Policy makers and analysts who are interested in estimating human rights effects at institutional changes and public policies levels, such as democratization, economic and military aid, structural adjustments, and humanitarian interventions are using the data (Cingranelli, Richards, & Clay, 2014). Accordingly, to ensure reliability, the CIRI dataset for every country-year is independently coded by at least experts that triangulate their coding with other researchers in the CIRI staff to resolve any disagreements. The Krippendorff's r-bar measure of interrater reliability for their recent coding was reportedly for the entire set was 0.944 (Cingranelli, Richards, & Clay, 2014).

Despite the limitations of using secondary data (Ary, Jacobs & Razavieh, 2002), they represent a snapshot of the country status. These snapshots are the first steps toward exploring broader theory and methodology to address the global issue on hand. Secondary aggregate data have been mostly modeled in development studies using such cross-sectional or longitudinal time series models. Cross section analysis, provides a snapshot of a cross sectional view of current condition in development and provides a platform for comparative policies and interventions. Most importantly, policy-makers are compelled to utilize these data to make the best possible decisions when data collections are either very expensive or difficult to attain in some of these countries due to political instabilities. However, combining usable information from diverse data source can be challenging. A common way of simplifying such vast amount of information is by creating indicators and factors to reduce them into their simplest form while retaining essential information and meanings. This is particularly relevant for this theory testing where the preferred data sets are not available and so surrogate measures are being used. Clearly, the information extracted for this study is for making general inferences and promoting a stronger methodology to test the proposed concept of sustainable intergenerational gender equality framework. Priority will be given in minimizing information

distortion by presenting an unbiased interpretations of data analysis with no definite causal proposals.

Operationalization of Variables

Endogenous Variable

To measure the SAAGII, this study uses indicators currently applied in calculating GII plus additional indicators. [The source for the data came from various UN and World Bank group organizations, and the data is made available through the World Bank. See table 2.2.] GII uses three key variables and related indicators to measure inequality gap: empowerment, reproductive health, and employment.

Empowerment. Empowerment in GII is measured using educational attainment (secondary level and above) and proportion of seats held by women in national parliaments (%). As specified in the literature earlier, this study identified an additional need for an indicator to capture empowerment through technology as an outcome indicator for the built capital. mobile cellular use by male and female is used as a proxy variable.

Reproductive health. GII measures reproductive health by using Maternal Mortality Ratio (MMR) and Adolescent Fertility Ratio (AFR). MMR measures the number of maternal deaths per 100,000 live births, while AFR measures the risk of childbearing among adolescents aged 15-19 and it captures the number of births per 1000 women of reproductive age in developing countries.

Formal and informal employment. Labor force participation rate in GII is measured as % male and female population ages 15+. It represents the formal labor force participation in the measure. To account for informal labor force participation, account at a financial institution, male and female (% age 15 and over) is used as a proxy variable that captures.

Environment and intergeneration. To capture this pertinent dimension in measuring sustainable gender equality, prevalence of anemia among children (% of children under 5),

children aged <5 years stunted, children aged <5 years underweight, and children aged <5 years wasted will be used to represent children (especially capture a girl child) in the dimension. Data source: Global Health observatory, WHO.

Exogenous Variables

Economic capital. Economic capital investors, at macro level investments through financial, trades, technologies etc., formally define financial capital as any asset for which a counterpart liability exists somewhere on the part of another institutional unit. This can be represented using Gross domestic products (GDP). Created during the Great Depression in the 1930s, it still provides a snapshot of the state of economy in a country and steers annual economic policies for them. GDP measures all national accounts, and Gross National Income that accounts for other informal market transactions such as remittance. This study uses GDP and GNI as proxies for economic capital.

Built Capital. If economic capital represents resource, built capital is the network that bridges facilitations of these resources. These two together promote efficient distribution of goods and services. Also, crucial aspect of economic capital is the produced capital, which includes fixed assets that are used repeatedly or continuously in production processes for more than one year. Fixed assets can be tangible, such as infrastructures, and intangible, such as technology and other specialized knowledge used in production. These built capitals are the foundation of a community that function as the delivery system in sustaining an infrastructure investment. These Built capitals have become the bridge at the core of determining ways other capitals can be used. For instance, digital technology are revolutionizing nations, institutions, and communities through its own unique culture by changing ways society operates, empowering individuals, toppling government systems, and promote participation in and contribute towards decision-making process at all levels of society. This study will use fixed broadband subscriptions (per 100 people), fresh water withdrawal and electricity as the proxy variables.

Natural capital. Natural capital includes the earth's limited stocks of natural resources, land, and the ecosystems that humans have been extracting to support their existence for millennia. In fact, most connect the concept of sustainability to this type of capital. When the Brundtland report came about, it was generated from the concept of pollution, exploitation, and overuse of natural capital and highlighted the importance of saving earth's natural fauna and its resources for the future generations to come. However, they also understood that socio-economic development is intricately intertwined with these natural resources. Natural resources, land and the ecosystems are considered essential to the long-term sustainability of development in providing functional economy, as well as to all the lives on earth (SEEA, 2003). Proxy measures for this construct will include Arable land (% land area), Improved water source, Forest area (% of land area) and CO2 Emissions (metric tons per area). Data source: World Bank

Human capital. Investment in human capital is the stock of skills for future input and output in relations to economic capital. The direct and indirect flow of these skills is forthcoming when there are returns to investments in education, health and trainings that exceed the cost. This study will use Education Investment, Health policy, and Mental Health policy. Data source for first two measures are from World Bank; UN Group (WHO) for later.

Social capital. Like other forms of capital, social participation generates benefits that improve wellbeing through networks and participation at all levels of society. This study will use Democracy Index (DI) that measures the state of democracy for 167 countries. Economic Intelligence Unit has been compiling it annually since 2006, with the latest data set published in 2015. DI measures electoral process, functioning of the government, political participation, political culture, and civil liberties using 60 different indicators. The scorings are categorized into full democracies, flawed democracies, hybrid regimes and authoritarian regimes.

Women's economic rights. It includes key indicators that are experiences faced by many women around the globe in contemporary times. These rights include: equal pay for

equal work; free choice of profession or employment without the need to obtain a husband or male relative's consent; the right to gainful employment without the need to obtain a husband or male relative's consent; equality in hiring and promotion practices; job security (e.g. maternity leave, unemployment benefits, no arbitrary firing or layoffs); non-discrimination by employers; the right to be free from sexual harassment in the workplace; the right to work at night; the right to work in occupations classified as dangerous, and the right to work in the military and the police force (Cingranelli, Richards, & Clay, 2014).

The scores range from 0 to 3, with 0 representing no economic rights ensured for women by the governing law and that systematic discrimination based on sex may have been built into the law. A score of 1 that indicates women had some economic rights under the law, but these rights were not effectively enforced. A score of 2 is an indicator of women with some legal economic rights, and the government fully and effectively enforced these rights in practice while still allowing for a low level of discrimination against women in economic matters. Finally, a score of 3 indicates that all or nearly all of women's economic rights were guaranteed by law and the government fully and vigorously enforces these laws in practice.

Women's political rights. It includes several internationally recognized political rights: the right to vote; the right to run for political office; the right to hold elected and appointed government positions; the right to join political parties, and the right to petition government officials.

Like economic rights, a score of 0 indicates women's political rights not guaranteed by law during a given year. A score of 1 represents women's political rights guaranteed in law, but severely prohibited in practice. A score of 2 indicates women's political rights guaranteed by law, but were still moderately prohibited in practice. Finally, a score of 3 indicates women's political rights guaranteed in both law and practice.

Women's social rights. It includes several internationally recognized political rights, including the right to: equal inheritance, to enter into marriage on a basis of equality with men,

to travel abroad, to obtain passport, to confer citizenship to children or a husband, to initiate a divorce, to own, acquire, manage, and retain property brought into marriage, to participate in social, cultural, and community activities, to an education, the freedom to choose a residence/domicile, freedom from female genital mutilation of children and of adults without their consent, and freedom from forced sterilization.

Like other rights described here, a score of 0 indicates women’s social rights not guaranteed by law during a given year. A score of 1 represents women’s social rights guaranteed in law, but severely prohibited in practice. A score of 2 indicates women’s social rights guaranteed by law, but were still moderately prohibited in practice. Finally, a score of 3 indicates women’s social rights guaranteed in both law and practice. See table 2.2 for variable codes and sources of data.

Table 2-2: Variables, codes, indicators, and data source

VAR	1 st Order Measures	2 nd Order Measures	Data Source
SAGGI			
Y1:	Gender Inequality Index (GII)	EPR: educational attainment; parliamentary representation	World Bank http://hdr.undp.org/en/composite/GII
Y2:	Mobile cellular usage between females and males (MOBILE)	RH: maternal mortality ratio; adolescent birth rates EPT: labor market participation	United Nations http://genderstats.un.org/#/indicators
Y3:	Malnourishment Gender Gap Index (MGGI)		
	Y3.1	Children aged <5 years overweight (OVERWT)	Global Health Observatory data, WHO http://apps.who.int/gho/data/node.main.1095?lang=en
	Y3.2	Children aged <5 years stunted (STUNTED)	Global Health Observatory data, WHO http://apps.who.int/gho/data/node.main.1095?lang=en

Table 2.2: *Continued*

VAR	1 st Order Measures	2 nd Order Measures	Data Source
	Y3.3	Children aged <5 years underweight (UNDERWT)	Global Health Observatory data, WHO http://apps.who.int/gho/data/node.main.1095?lang=en
	Y3.4	Children aged <5 years wasted (WASTING)	Global Health Observatory data, WHO http://apps.who.int/gho/data/node.main.1095?lang=en
Y4:	Financial Independence	Account at a financial institution for female and male (% age 15+) (BNKACCT)	World Bank http://data.worldbank.org/indicator
Capital			
X1:	Economic Capital		
	X1.1	GDP per Capita (GDP)	World Bank http://data.worldbank.org/indicator
	X1.2	GNI PPP (GNI)	World Bank http://data.worldbank.org/indicator
X2:	Built Capital		
	X2.1	Internet users (per 100 people) (INTERNET)	World Bank http://data.worldbank.org/indicator
	X2.2:	Fixed broadband subscriptions (per 100 people) (BROADBAND)	World Bank http://data.worldbank.org/indicator
	X2.3:	Access to electricity (% population) (ELECTRICITY)	World Bank http://data.worldbank.org/indicator
	X2.4:	Improved water source (% of population with access) (IMPWTRSRC)	http://data.worldbank.org/indicator
X3:	Social Capital		
	X3.1:	Democracy Index (DEMSCOR)	Economist Intelligence Unit
X4:	Natural Capital		
	X4.1:	Arable land (%land area) (ARABLELAND)	World Bank http://data.worldbank.org/indicator
	X4.2:	Annual freshwater withdrawals, total (% of internal resources) (FRSWTRWD)	World Bank http://data.worldbank.org/indicator

Table 2.2: *Continued*

VAR	1 st Order Measures	2 nd Order Measures	Data Source
	X4.3:	CO2 emissions (metric tons per capita) (CO2EMIS)	World Bank http://data.worldbank.org/indicator
	X4.4:	Forest area (% of land)	World Bank http://data.worldbank.org/indicator
X5:	Human Capital		
	X5.1	Government expenditure on education, total (% of GDP)	World Bank http://data.worldbank.org/indicator
	X5.2	Health expenditure, public (% of total health expenditure)	World Bank http://data.worldbank.org/indicator
	X5.3	Mental Health Policy	Global Health Observatory, WHO http://apps.who.int/gho/data/node.im r
	X5.4	Mental Health Plan	Global Health Observatory, WHO http://apps.who.int/gho/data/node.im r
Women's Rights			
Z1:	Economic		CIRI Human Rights Data http://www.humanrightsdata.com/p/data-documentation.htm
Z2:	Political		CIRI Human Rights Data http://www.humanrightsdata.com/p/data-documentation.html
Z3:	Social		CIRI Human Rights Data http://www.humanrightsdata.com/p/data-documentation.html

Data Analysis and Results

Type of Analyses Used

Descriptive and diagnostic test using univariate level analysis allow for the diagnoses of characteristics and attributes of different variables involved in the quantitative data analysis. It provides an understanding of range of values, central tendency, proportion, pattern of

frequency distribution and outliers in the variable, and missing data. Based on the univariate analysis, types of data pattern, missing data and outliers will be addressed followed by further diagnoses for multicollinearity and linearity tests.

To construct the standardized scales for SAGGI, a gender gap index will be created initially for children's malnourishment using indicators from the World Health Organization (WHO). Next, gender gap for account in a financial institute and mobile phone use will be calculated using female to male ratio based on their population proportion. Finally, SAGGI will be calculated using the additive method based upon weighted values of the indicators.

Next, factor scores will be calculated for economic capital, social capital, built capital, natural capital, and human capital as proposed in the model, measured by single or multiple indicators. As shown in Figure 1.2, the five exogenous variables for capital, and one each for women's rights will be generated as part of the latent construct, using confirmatory factor analysis (CFA). If there are any single item measure used, the factor loadings will be fixed to 1 and the error variance to a 0. For those that will not load, a parceling technique will be used by creating a composite variable (sum or average) for two or more items, (Little, Cunningham, Shahar, & Widaman, 2002). Using such parceled items will enhance the psychometric characteristics and model-fitness in SEM (Matsunaga, 2008; Little et al., 2002; Hall, Snell, & Foust, 1999). Per Little et al. (2002), parceling relieves psychometric issues such as reliability, communality, and distribution violations created using single items. The technique also improves the overall model fit by reducing number of indicators required in the latent factor constructs (Kang, 2015; Matsunaga, 2008; Hall, Snell, & Foust, 1999). After the first order constructs are confirmed, regressions will be run to test each of the hypotheses.

Simple regressions and moderated hierarchical multiple regression will be used to test the five proposed hypotheses. Next, a separate exploratory application of the study uses structural equation model (SEM) technique to assess the structural association between

Capital and SIGGI with the mediating variable of women's rights for theory testing. Coefficients and fitness indices will be reported for the model.

Sample Size

Flexibility in SEM allows for complex associations using various types of data that are at categorical level to variability across dimensional, and comparisons of models (Wolf, Harrington, Clark, & Miller, 2013). The same feature of SEM also makes it difficult to generalize guidelines regarding the requirements for definitive sample size (MacCallum, Widaman, Zhang, & Hong, 1999). Many variations have been proposed and applied using a minimum sample size of 100 or 200 (Boomsma, 1982, 1985); 5 or 10 observations per estimated parameter (Bentler & Chou, 1987; see also Bollen, 1989), and 0 cases per variable (Nunnally, 1967). Wolf, Harrington, Clark, & Miller, (2013), applied a Monte Carlo data simulation technique to evaluate sample size requirements for applied SEMs. They used a series of simulations generating systematic variations in key model properties, number of indicators and factors, factor loadings magnitude and path coefficients, as well as amount of missing data. The researchers assessed the changes in parameters and the impact on sample size requirements based on statistical power, parameter estimate biases, and overall solution propriety (Wolf, Harrington, Clark, & Miller, 2013). They proposed a range of sample size requirements from 30 to 460 cases for a meaningful pattern of association between sample size and parameters and sample size. Since this study uses $n=155$, it satisfies the sample size rule to run the SEM.

Missing data

In this section, a priori analyses to identified unforeseen data issues is addressed systematically to prepare for multivariate analyses. As stated, data screening for missing values, assessment of distributional properties and outliers will be conducted.

Missing or incomplete data is inevitable in social science research, particularly when the data set being used is collected for alternative purposes than intended in this study. Missing data at national level surveys occur for various reasons, such as conflict in the country, lack of government accountability, or policy and budget priorities. Although data may be missing randomly [missing at random (MAR)], there are higher probabilities that cross-national data collection, such as the ones being used for this study, may also involve systematic collection error [missing not at random (MNAR)]. Despite the cause or the nature of missing data, it is imperative to address them to make any valid inferences of a study outcome (Abu-Bader, 2011; Byrne, 2001; Schafer & Graham, 2002). Hence, to screen for missing cases and variables, frequencies and distributions were run initially.

Case and variable screenings. Based on the case screening, Bahamas and Samoa had more than 25% data missing. To maintain the sample size and to account for uniqueness of each country, decision was made to keep the cases in the analysis. This decision was made while keeping in perspective that although refraining from pairwise deletion may reduce variances, it will prevent from reduction in power since the study only had 155 countries.

Next, screening was performed for missing values in the variables. Based on frequency statistics, out of 28 variables identified for the study, 22 of them had one or more missing values. The ratio of female to male variable (MOBILE) had approximately 28% data missing. Since this is one of the key indicator being used theoretically, decision was made to keep the variable. Other variables related with malnourishment also had approximately 20% data missing. Again because of theoretical relevance to this study, variables were kept in the analysis.

Missing value impact analysis. In cases of larger sample size with randomly missing values, exclusion of missing cases is justifiable (Abu-Bader, 2011). When only 5 percent or less cases have missing values at random, then any method of handling the missing values will

yield similar results and will not impact the study results (Abu-Bader, 2011; Tabachnick & Fidell, 2007). However, if the number of cases with missing values are greater than 5 percent, and/or if they are not missing randomly, excluding the cases can impact the study results. Hence, to evaluate the likelihood of missing value effects, missing value impact analysis was conducted based on the process described by Abu-Bader (2011).

First, dummy variable (0, 1) were created, where 1 represented valid cases and 0 represented all cases with missing values. For all those missing variables, a new variable was generated with a tag, Missing_variable. Next, independent t-tests were run to assess the significant differences on the dependent variable, GII. Five variables [UNDERWT: (M=0.14, SD=0.09) for missing and (M=0.43, SD=0.16) for non-missing, $t(153)=-9.962$, $p=0.000$; OVERWT: (M=0.16, SD=0.12) for missing and (M=0.43, SD=0.16) for non-missing, $t(153)=-9.271$, $p=0.000$; WASTING: (M=0.13, SD=0.09) for missing and (M=0.44, SD=0.16) for non-missing, $t(153)=-10.787$, $p=0.000$; STUNTED: (M=0.16, SD=0.10) for missing and (M=0.43, SD=0.16) for non-missing, $t(153)=-10.102$, $p=0.000$, and FOSSILCSP: (M=0.53, SD=0.13) for missing and (M=0.33, SD=0.18) for non-missing, $t(153)=5.386$, $p=0.000$] were identified as having significant impact on data analysis because of higher than 5% data missing. Results of the independent t-tests are shown in Table 3-1.

Table 3-1: Results of the independent t-Tests for >5% missing values impact.

(>5% MISSING CASES) VARIABLES	n	M(SD)	t
MOBILE			
Missing (0)	44	0.38(0.18)	0.864
Not-Missing (1)	11	0.36(0.20)	
UNDERWT			
Missing (0)	33	0.14(0.09)	-9.962 ***
Not-Missing (1)	122	0.43(0.16)	
OVERWT			
Missing (0)	37	0.16(0.12)	-9.27***
Not-Missing (1)	118	0.43(0.16)	
WASTING			
Missing (0)	36	0.13(0.09)	-10.787***
Not-Missing (1)	119	0.44(0.16)	
STUNTED			
Missing (0)	36	0.16(0.10)	-10.102***

Table 3.1: *Continued*

(>5% MISSING CASES) VARIABLES	n	M(SD)	t
Not-Missing (1)	119	0.43(0.16)	
BNKACCT			
Missing (0)	15	0.39(0.19)	0.610
Not-Missing (1)	140	0.36(0.19)	
GNI			
Missing (0)	6	0.47(0.17)	1.303
Not-Missing (1)	149	0.36(0.19)	
DEMSCORE			
Missing (0)	7	0.45(0.17)	1.142
Not-Missing (1)	148	0.36(0.19)	
FOSSILCSP			
Missing (0)	27	0.53(0.13)	5.386***
Not-Missing (1)	128	0.33(0.18)	
EDU_EXP			
Missing (0)	32	0.39(0.18)	0.874
Not-Missing (1)	123	0.36(0.19)	
MH_LEGISL			
Missing (0)	7	0.36(0.19)	-0.111
Not-Missing (1)	148	0.37(0.19)	
MH_PLAN			
Missing (0)	7	0.36(0.19)	-0.111
Not-Missing (1)	148	0.37(0.19)	
MH_POLICY			
Missing (0)	7	0.36(0.19)	-0.111
Not-Missing (1)	148	0.37(0.19)	

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Missing data imputation. After evaluating the range and effects of missing data, multiple-imputation method was applied. Multiple-imputation is one of the highly recommended missing data procedure (Graham, 2009) and uses linear regression for interval or ratio level data and logistic regression for ordinal or nominal level data. This technique applies repeated stochastic procedure and is considered suitable for data set with arbitrary or missing at random pattern of values and results in approximate distributions based on Bayesian analysis. The first step of the procedure generates several completed data sets by replacing the missing values through random drawing process from the conditional distribution of missing data. Next, the process analyzes each constructed data set separately and converges the results of the analysis by taking variation due to sampling and missing data into account with variation due to imputation. The process is repeated based on the specified set iterations.

Using SPSS software's multiple imputation function, 2 imputations with 1000 maximum iterations for fully conditional specification (MCMC) was run first, followed by 20 imputations with 200 iterations to converge the data as recommended by Graham (2009) and Huisman (2000). They recommend 40 imputations for 50% missing information to maintain sufficient power and this study has mostly 25 -28% missing values; hence, for efficiency and convergence, 2 to 5 times was considered good enough]. This technique is more rigorous and maximizes variations in the data set as opposed to unconditional single imputation such as mean imputation, single regression or hot decking techniques that generate more biased estimates of variances and covariances. However, caution in interpretations need to be made when analyzing study outcomes (Rubin, 1987) because of data imputations.

Outliers

Outlier diagnosis. Following data imputations, box plot method was used to view the scope of outliers in the study. More than one variable had outlier issue [MOBILE, WOSOC, FRSWTRWD, GNI, and GDP]. A multivariate method of addressing the outliers was used given that there are more than one variables with outliers. *Mahalanobis* distance also known as Mahalanobis D2 was utilized to measure the distance of a given score from the mean score of a combination of variables based on the chi-square distribution (Abu-Bader, 2011). A score is considered an outlier if Mahalanobis value exceeds a chi-square critical value at $\alpha = .001$ and the degrees of freedom equals number of variables in the analysis (Abu-Bader, 2011). Given the critical value (20.515) for chi-square, the degrees of freedom ($df = 5$) and alpha of .001, three values exceeded the critical value and were considered outliers. Close inspection revealed five cases with much greater value than the critical value. Instead of deleting the outliers, data transformation was performed to maintain the sample size and power.

Normality distribution and data transformation. Next, frequencies were run to check for Fisher's skewness and kurtosis to assess the distributional properties of the

variables. Normally, values between 1 to -1 are considered as acceptable range of skewness (degree of normal distribution around the mean) and kurtosis (degree of peakness) (Mertler & Vannatta, 2002). However, variables with larger values or sample may deviate considerably from the centroid (Mertler & Vannatta, 2002). In the current analysis, attention was mainly given to values that deviated considerably from the zero. Variables MOBILE, OVERWT, WASTING, GNI, GDP had higher kurtosis, and variables UNDERWT, STUNTED, FRSWTRWD, and CO2emis had negative skewness and high kurtosis. The histogram and Q-Q plot also confirmed this diagnosis. Thus, to correct the negative skewness, 1-Maximum was used to transform the value into positive values. To correct high kurtosis, square root transformation and natural logarithm were used. See Table 3.2 for the descriptive statistics after the data transformation was completed.

Table 3-2: Descriptive statistics after data transformation.

Variable Name	Mean	Std. Deviation	Skewness	Kurtosis
GII	0.6341	0.19146	0.093	-1.121
MOBILE	1.7941	0.18096	0.78	6.253
UNDERWT	0.0642	0.03027	2.999	18.112
OVERWT	1.3026	0.09725	0.341	2.762
WASTING	1.3123	0.10862	1.758	8.538
STUNTED	0.068	0.02853	2.799	14.251
BNKACCT	0.1819	0.24223	0.995	1.808
GNI	1.0584	0.59938	0.197	-0.844
GDP	1.0631	0.59171	0.159	-0.878
INTERNET	45.8335	29.04045	0.085	-1.273
IMPRVDWTR	2.7889	1.82297	0.87	-0.295
BROADBAND	12.02081	12.73247	0.765	-0.706
ELECTRICITY	3.3134	3.13149	0.972	-0.74
DEMSCOR	-4.758	2.10408	0.168	-0.923
ARABLELAND	16.0489	14.30182	1.102	0.574
FRSWTRWD	0.7619	0.1465	3.087	26.668
RNENERGY	32.077	29.70353	0.719	-0.66
FOSSILCSP	5.4676	2.55245	0.007	-1.071
CO2EMIS	6.6159	0.40125	2.179	5.172
FRST_AREA	29.9916	22.40983	0.484	-0.433
EDUC_EXP	15.3805	5.09166	0.296	-0.282
HEALTH_EXP	6.9665	0.48866	0.653	0.78

Table 3.2: *Continued*

Variable Name	Median	Std. Deviation	Skewness	Kurtosis
MH_LEGISL	1	2.51268	0.468	-1.804
MH_PLAN	1	0.40607	1.465	0.147
MH_POLICY	1	0.46386	0.831	-1.326
WECON	1	0.91292	0.36	-0.615
WOPOL	2	0.49615	0.182	0.981
WOSOC	1	1.01921	0.418	-0.921

MGGI and SAGGI Indices

To construct the outcome variable, SAGGI, initial steps included creating the Malnutrition Gender Gap Index (MGGI) based upon World Health Organization (WHO) indicators on malnutrition of children <5 years of age on overweight, underweight, stunted and wasting. Four steps set out by the Gender Gap Index (GGI) was used in calculating the standardized weighted scale (Hausmann, et. al., 2006). The GGI uses a one-sided scale that measures how close girls are to reaching parity with boys without rewarding or penalizing countries for having gender gap in the reverse direction and does not reward them for having exceeded the parity benchmark (Hausmann, et. al., 2006). The other option would have been to use a two-tailed negative-positive scale; however, this type of scale would penalize boys' advantage over girls or vice-a-versa, and give the highest points to absolute equality (Hausmann, et. al., 2006). The four steps used to generate this scale are: 1) convert to ratios, 2) truncate data at equality benchmark 3) calculate the index score and 4) calculate the final score for the scale (Hausmann, et. al., 2006).

First, the gender ratio was calculated using proportion of female children (in percent) to proportion of males (in percent) using the indicators of malnourishment. Then, equality benchmark was set at 1, representing the nutritional requirements for children under the age as set at similar levels for males and females despite their sex. Additionally, truncating the data at the equality benchmark assigns the same score to a country that has reached parity between girls and boys and one where women have surpassed men.

Next, to create the MGGI, the process involved calculating the weighted average of the indicators within the malnourishment index to generate the index score. Simply averaging the different indicators would implicitly provide more weight to the indicator that has the largest variability or standard deviation. Hence, to normalize the indicators, standard deviations for each indicator was calculated. Then a 1%-point change was accounted for in the standard deviation by dividing 0.01 with the standard deviation for each indicator. The sum average of standard deviation divided each item per 1%-point change to calculate the weighted average of the four indicators. The generated weight was then applied to each value. The final step used the additive measures to generate the index. See table below for the calculated weights. See Table 3.3.

Table 3-3: Weights for Malnourishment Gender Gap Index

Indicators	Mean	SD	1% Pt change of SD	Weight
Underweight	0.064	0.030	0.330	0.377
Overweight	1.303	0.097	0.103	0.118
Wasted	1.312	0.109	0.092	0.105
Stunted	0.068	0.029	0.351	0.400

Next, to calculate the SAGII, similar weighting technique was applied. The existing index of GII was used, along with MGII calculated above. The two other indicators used were ratio of mobile phone usage for female to male and account in the financial institute. Equality benchmark was set at 1 and weights were calculated and applied to normalize the data. Final step included additive measures to generate the SAGII index. See Table 3.4.

Table 3.4: Weights for Sustainability Adjusted Gender Gap

Indicators	Mean	SD	1% Pt change of SD	Weight
GI	0.634	0.191	0.052	0.097
MGGI	0.794	0.181	0.055	0.103
Mobile Phone usage	0.182	0.242	0.041	0.077
Account in the Financial Institute	0.343	0.026	0.388	0.723

Testing Hypotheses

To test for the proposed hypotheses, first this study looked at bivariate correlations between dependent variables and independent variables. PCA was conducted to develop factor scores for capital measures. PCA is a variable reduction technique using orthogonal rotations generating principle component factors. It explains more variances that account for uncorrelated orthogonal linear combinations of weighted observed variables in the data. Fresh water withdrawal and arable land communalities were removed from the analysis due to low communalities and negative loadings. Loadings with higher than .4 were retained and total variances explained were greater than 50% as expected from PCA. Kaiser-Meyer-Olkin (KMO) and Bartlett Test of Sphericity were significant with $p < .001$. Table 3.5 presents the five factor scores generated through this process for further analysis.

Table 3-5: Factor scores representing the five capital variables.

Factors	Loadings	Total variance explained (%)	χ^2	df
Economic Capital (EC)		99.05	499.47***	1
GNI	.995			
GDP	.995			
Natural Capital (NC)		66.57	414.20***	6
Renewable Energy	.959			
Cnsp				
Fossil Fuel Cnsp	.911			
CO2 Emission	.895			
Forest Area (% of land)	.779			
Human Capital (HC1)		59.28	73.605***	10
Mental Health Plan	.856			
Mental Health Policy	.859			
(HC2)				
Education Expenditure	.717			
Health Expenditure, total % of GDP	.987			
Built Capital (BC)		78.54	517.29***	6
Internet users	.937			
Fixed broadband	.857			
Improved water source	.872			
Access to electricity	.877			

Note: (*) $p \leq 0.05$; (**) $p \leq 0.01$; (***) $p \leq 0.001$

Furthermore, for the statistical power [the probability of rejecting the null hypothesis when it is false or the probability of not making a Type II error (see Cohen, 1988)], alpha level, the magnitude of the effect of interest, and the sample size bias in the parameter estimates and standard errors were considered using G*Power software using 28 number of variables and split-sample analysis. Alpha was set at $p \leq 0.05$.

Main Effects

Next, simple linear regressions were run to predict the dependent variable based on each factor scores. First, to test the proposed hypothesis, [HA1: as economic capital improves, sustainability adjusted gender gap decreases], economic capital was regressed on SAGGI. The result indicated 16.9% of the variances explained [$R^2 = .028$, $F(1, 153) = 4.47$, $p < .05$].

Economic capital significantly predicted SAGGI ($\beta = .17$, $p < .05$). Hence, increase in economic measures such as GDP and GNI, increased the gender gap. Inequality increased when economic capital improved and failed to reject the null hypothesis. This result is consistent with the literature that modernization and free market economy without considering the rights of marginalized people only increases disparities.

In terms of natural capital effect on SAGGI, [HA2: as natural capital improves, sustainability adjusted gender inequality decreases], the result indicated 22.8% of the variances explained [$R^2 = .052$, $F(1, 153) = 8.38$, $p < .05$]. Natural capital significantly predicted SAGGI ($\beta = -.23$, $p < .05$). Increase in factors such as renewable energy and fossil fuel consumption, CO2 emissions and forest area (% of land) negatively predicted gender gap. Inequality among females and males decreased when natural capital improved. This may be since more resourceful countries are at the forefront of consumption of these resources and tend to be in categories of very high-human development countries where gender inequality gap is smaller.

The regression result for human capital effect on SAGGI indicated a significant model [$R^2 = .052$, $F(2, 152)=4.68$, $p<.05$] with 24.1% of the variances explained. This is a multiple regression with two factors of human capital, one measuring mental health plan and policies (HC1) and the other health and medical expenditures (HC2). Health and medical expenditures (HC2) is a significant predictor of SAGGI ($\beta = -.21$, $p<.05$), where increase in expenditures, decreases the gender gap. Overall, the null hypothesis of no difference was rejected for expenditures and accepted for mental health policy and plans. Countries where mental health policies and plans are prioritized, there's more investment in the human capital and promotions of gender equality policies.

Next, the built capital factor was regressed on SAGGI. The regression result for indicated a significant model [$R^2 = .005$, $F(1, 153)=10.51$, $p<.05$] with 24.4% of the variances explained. Built capital is a significant predictor of SAGGI ($\beta = .2541$, $p<.05$), where improvements in internet, broadband, improved water source, and electricity, positively predicted the gender gap. In other words, improvement in such advancement may overlook gender inclusion and create more disparities. Finally, social capital measure that used Democracy Index as the proxy variable was not a significant predictor of gender inequality. See Table 3.6 for more details on the regressions.

Table 3-6: Simple Linear regressions of Capitals on Sustainability Adjusted Gender Gap Index

Predictors	β	p	R^2	r
Economic Capital	.169	.036*	.028	.169
Natural Capital	-.228	.004**	.052	.228
Social Capital	-.072	.372	.005	.072
Human Capital		.011*	.058	.241
(HC1) Mental Health	-.098	.218		
(HC2) Health and	-.211	.008**		
Education				
Built Capital	.254	.001***	.064	.254

Note: (*) $p \leq 0.05$; (**) $p \leq 0.01$; (***) $p \leq 0.001$

Hierarchical Regression with Moderated effects

Finally, to test for the moderation effect of women's rights on capital and SAGGI, hierarchical multiple regression with a moderator variable was run. Moderated models are used to identify factors that change the relationship between independent and dependent variables. Based on the literature presented earlier, women's rights have been proposed to have a change effect on promoting gender equality. To test this, forward stepwise hierarchical multiple regression was conducted to provide clarity on any unambiguous conclusions regarding the existence of the proposed effect by the women's rights variable. Women's economic rights, social rights and political rights variables were each recoded and a dummy variable was created. These are ordinal level data where a score of 0 indicated women's rights in each dimension not guaranteed by law during a given year; 1 represents women's rights guaranteed in law, but severely prohibited in practice. These two were coded as 0 for having none to very limited rights. A score of 2 for women's rights guaranteed by law, but were still moderately prohibited in practice and a score of 3 where women's rights are guaranteed in both law and practice were coded as 0. This was labeled the women's rights (wr) variable. Also, an interaction term between the women's right variable and natural capital was created to understand further the effects of natural capital, since this was the only factor with full predictor on SAGGI.

Variables were entered in the regressions based on historical influences of economic development and since natural capital is also evaluated currently in terms of wealth accounts by the World Bank (2016), these two were entered first. Next, indicators of social development (health and education) were entered with social capital factor. Finally, the new surge of infrastructure development in technology and broadband has given a new momentum to development, as explained in the literature. The built capital variable was entered next in the reaction. At each level, the women's rights variable was added in. In the last model, interaction term between natural capital and women's rights were entered in in the reaction.

As shown in Table 2.0, results show that hierarchical multiple regression model was tested to investigate the effects of various capitals on sustained gender equality and whether these effects change when women have their rights or not. After centering capital-related variables and SAGGI, and computing the women's rights and natural capital interaction term (Aiken & West, 1991), the predictors and the interaction were entered in the hierarchical regression model. All the models had more than .10 tolerance and VIF of less than 10, indicating no multicollinearity issues. This may be because of the data screening conducted earlier in the process.

In the first model, economic capital and natural capital were entered to assess the direct effect of these factors on gender inequality and in the next step, the same variables were entered along with the moderator variable. The results indicated no significant direct effect of economic capital, while natural capital ($b = -.330$, $SEb = .003$, $\beta = -.009$, $p < .01$) had significant association with the SAGGI. In other words, women's rights increased the effect of natural capital on gender inequality. The negative beta indicated an increase in natural capital, decreased the gender inequality. However, economic capital was not significantly associated with the gender gap. This is an interesting finding in that earlier analysis of simple linear regressions showed direct effects. The result of this analysis may be because of compounding effects of entering natural capital and economic capital together in the equation. The regression result indicated a significant model [$\Delta R^2 = .126$, $F(3, 151) = 7.245$, $p < .001$] with 35.5% of the variances explained.

Second model was also significant [$\Delta R^2 = .136$, $F(5, 149) = 4.694$, $p < .001$] with 36.9% of the variances explained. Human capital factors were entered in the equation in addition to economic, natural capital and the moderator variable. The result indicated effects of natural capital on gender inequality as significant in the presence of women's rights ($b = -.317$, $SEb = .108$, $\beta = -.317$, $p < .01$).

Significant model persisted in the third model [$\Delta R^2 = .151$, $F(6, 148)=4.399$, $p<.001$] with 38.9% of the variances explained. Democracy Index representing electoral process, functioning of the government, political participation, political culture, and civil liberties as a proxy variable to social capital was entered in this model in addition to the previously entered factors. Again, natural capital was significant ($b = -.259$, $SEb = .113$, $\beta = -.259$, $p < .05$) along with the moderator variable of women's rights ($b = .617$, $SEb = .184$, $\beta = .356$, $p < .001$).

Interestingly, in the fourth model, when the built capital was entered, there was a significant effect on social capital ($b = -.267$, $SEb = .123$, $\beta = -.267$, $p < .05$), the built capital ($b = .442$, $SEb = .193$, $\beta = .442$, $p < .05$) and the economic capital ($b = -.366$, $SEb = .183$, $\beta = -.366$, $p < .05$). However, there was no significant effect of natural capital on gender inequality. The model was significant [$\Delta R^2 = .180$, $F(7, 147)=3.971$, $p<.001$] with 42.5% of the variances explained.

Finally, the fifth model with addition of interaction term of women's rights and natural capital and all other factors was a significant model as well [$\Delta R^2 = .200$, $F(8, 146)=4.573$, $p<.001$] with 44.8% of the variances explained. Economic capital ($b = -.395$, $SEb = .182$, $\beta = -.395$, $p < .05$), built capital ($b = .390$, $SEb = .193$, $\beta = .390$, $p < .05$), and natural capital ($b = -.532$, $SEb = .230$, $\beta = -.532$, $p < .05$) were all significant in this model along with the moderator variable ($b = .716$, $SEb = .192$, $\beta = .438$, $p < .001$). Since there appeared to be some interaction effect between natural and economic capital, an interaction term of women's rights and natural capital was entered in this reaction with a result of no significant effect.

The proposed hypothesis that the effects of capital on SAGGI is moderated by women's rights is partially supported for all the capitals. Except for human capital, effects of economic capital, social capital, built capital and natural capital on gender inequality, were moderated by women's rights. See Table 3.7 for details.

Table 3-7: Moderated effects of women's rights on effects of capital on gender inequality

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.701	.211		-3.323	.001
	EC	-.186	.119	-.186	-1.567	.119
	NC	-.330	.107	-.330	-3.067	.003
	wr	.549	.154	.316	3.560	.000
2	(Constant)	-.611	.222		-2.750	.007
	EC	-.219	.121	-.219	-1.807	.073
	HC1	-.043	.079	-.043	-.545	.587
	HC2	-.111	.089	-.111	-1.240	.217
	NC	-.317	.108	-.317	-2.922	.004
	wr	.478	.163	.275	2.927	.004
3	(Constant)	-.789	.246		-3.202	.002
	EC	-.098	.142	-.098	-.689	.492
	HC1	-.055	.079	-.055	-.690	.491
	HC2	-.111	.089	-.111	-1.245	.215
	SC	-.198	.121	-.198	-1.632	.105
	NC	-.259	.113	-.259	-2.286	.024
	wr	.617	.184	.356	3.364	.001
4	(Constant)	-.806	.243		-3.318	.001
	EC	-.366	.183	-.366	-2.004	.047
	HC1	-.058	.078	-.058	-.736	.463
	HC2	-.058	.091	-.058	-.639	.524
	SC	-.267	.123	-.267	-2.164	.032
	BC	.442	.193	.442	2.286	.024
	NC	-.156	.120	-.156	-1.296	.197
	wr	.631	.181	.363	3.485	.001
5	(Constant)	-.959	.254		-3.778	.000
	EC	-.395	.182	-.395	-2.177	.031
	HC1	-.043	.078	-.043	-.552	.582
	HC2	-.050	.090	-.050	-.554	.581
	SC	-.205	.126	-.205	-1.623	.107
	BC	.390	.193	.390	2.017	.046
	NC	-.532	.230	-.532	-2.307	.022
	moderator variable	.761	.192	.438	3.963	.000
	wr_x_nc	.304	.160	.370	1.905	.059

Note: (*) $p \leq 0.05$; (**) $p \leq 0.01$; (***) $p \leq 0.001$

Final Structural Equational Model

For the final model testing, an Exploratory Factor Analysis (EFA) was run to identify the underlying latent constructs on understanding the variables chosen in this study. Factor components for all 19 predictors were included in the analysis. All the items correlated with at least one other item, suggesting reasonable factorability. Next, the Kaiser-Meyer-Olkin measure of sampling adequacy of .5 and above criteria for the predictor variables indicated the appropriateness of applying factor analysis. The factorability of each item and the resulting dimensions were further confirmed using the correlation matrix. Final model generated three factors for a parsimonious model of predictability for each factor and were named, Economic and Political factor, Environmental factor, and a Social factor. See Table 3.8.

Table 3-8: Loadings and variances from the exploratory factor analysis results.

Factors (Capitals)	Indicators	Loadings	Total variance explained (%)	χ^2	df
			77.29	1977.92***	55
Economic and Political	GNI	.870			
	GDP	.879			
	Fixed broadband	.891			
	Improved water source	.613			
	Democracy Index Score	.723			
Environmental	Renewable Energy Consumption	.863			
	Fossil Fuel Consumption	.977			
	CO2 Emission	.671			
Social	Mental Health Plan	.797			
	Mental Health Policy	.632			

Table 3.8: *Continued*

Factors (Capitals)	Indicators	Loadings	Total variance explained (%)	χ^2	df
Women's rights			56.14	150.97***	3
	Women's Economic Rights	.821			
	Women's Political Rights	.424			
	Women's Social Rights	.912			

Note: (*) $p \leq 0.05$; (**) $p \leq 0.01$; (***) $p \leq 0.001$

Note: Women's rights were excluded from the final model and was run separately because it didn't add to the parsimony of the factors.

Next a structural model was confirmed using AMOS 2.3 version based on the theoretical understanding of women's rights as a mediating variable between the endogenous variables: economic and political, social, and environmental variables and the outcome variable of SAGGI. Model fitness resulted in, RMSEA of .044; GFI (.960) and AGFI (.913) values were greater than .90, and CFI of .988. These values are indicative of good fit (Byrne, 2010). Cronbach's alpha for all items in the scales was higher than .70 suggesting an adequate level of reliability. A post-hoc modeling method was employed to improve goodness of fit of the scale. For a better fit, the covariance between indicators was freely evaluated and the final effect of three dimensions of social, economic, and political, and environments (indicative of sustainable development dimension) on SAGGI, mediated by women's rights were tested. The chi-square was 32.3 and degrees of freedom was 25 with the model fit achieved at 10 iterations. The fit model is presented in Figure 1.2. The results of the structural equation modeling analysis examining the effects are presented in Table 3.10.

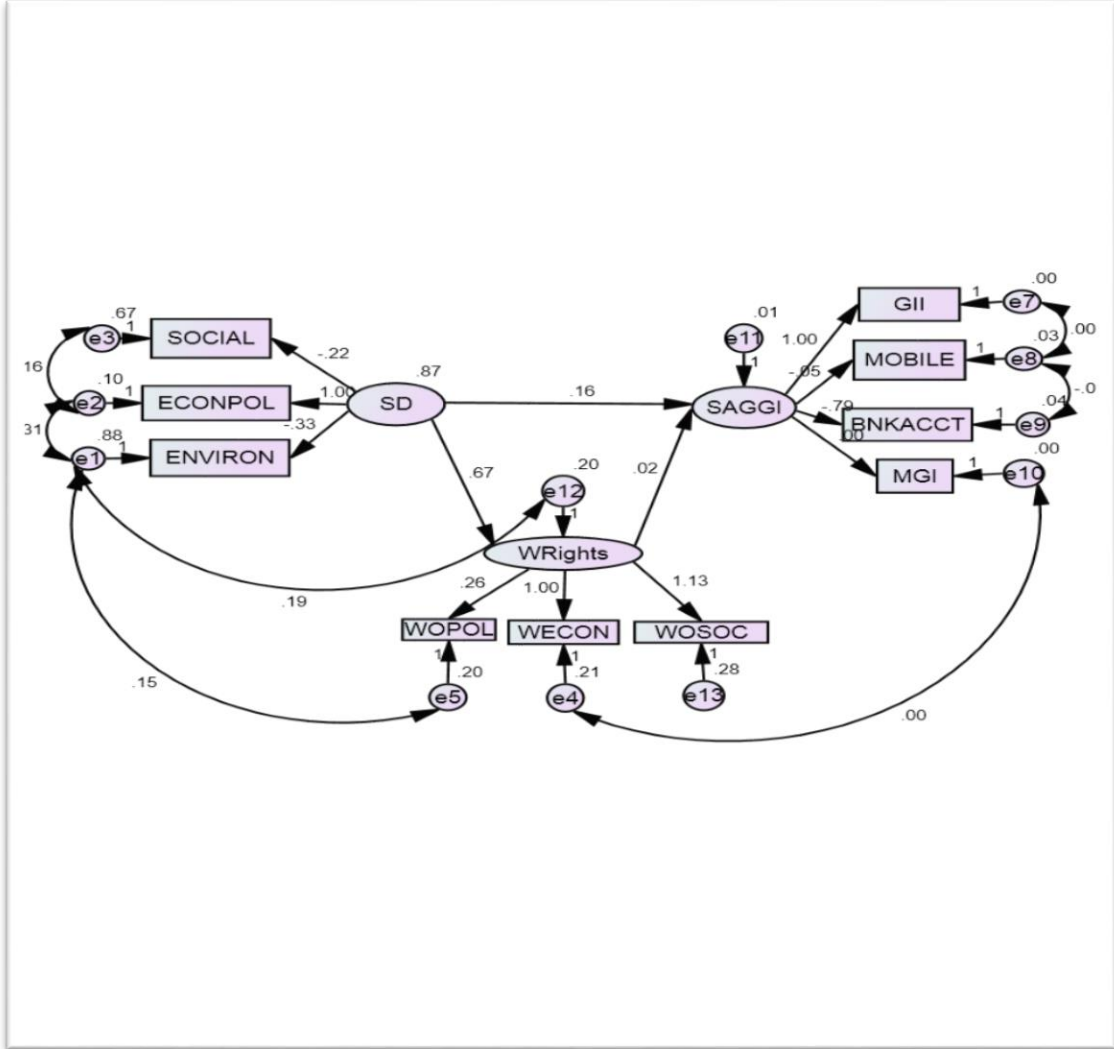


Figure 1-2: Structural model for sustainable gender equality framework

After the measurement model was tested, several associations were identified among the factors as shown in table 3.9. Sustainable developmental factors were associated with women's rights factors, whereas the latter were associated with the SAGGI measures. Results of the assessment of the model showed that environmental factors were negatively associated with women's political rights ($r = -0.350$, $p = 0.001$) but they didn't have had a significant

correlation with the Women's rights construct ($r=0.441$, $p=0.143$) nor with the economical and political factors included in the model ($r= 1.053$, $p=0.285$) (Table 3.9).

Table 3-9 Correlations

			Estimate	S.E.	C.R.	P
ENVIRO N	<-->	WOPOL	-.350	.035	4.252	***
MOBILE	<-->	BANKACC T	-.302	.003	-3.422	***
GII	<-->	MOBILE	.339	.001	-2.615	.009
SOCIAL	<-->	ECONPOL	.634	.081	1.947	.048
ENVIRO N	<-->	ECONPOL	1.053	.286	1.070	.285
WECON	<-->	MGI	-.397	.001	3.779	***
ENVIRO N	<-->	WRIGHTS	.441	.128	1.466	.143

Note: (*) $p \leq 0.05$; (**) $p \leq 0.01$; (***) $p \leq 0.001$

Additionally, mobile phone usage was positively associated with GI index ($r=0.339$, $p=0.009$) but negatively associated to possibility of having a bank-account factor ($r=-0.302$, $p=0.001$) indicating that women were less likely to open and manage their own bank services. Not surprisingly, women with economic right were less likely to have malnourished children ($r=-0.397$, $p=0.001$) and economic and political factors were strongly associated with social developmental factors ($r=0.634$, $p=0.048$). See Table 3.9 for details.

Table 3-10 Regression weights

			Estimate	S.E.	C.R.	P
WRights	<---	SD	.809	.234	2.855	.004**
SAGGI	<---	WRights	.091	.152	.140	.889
SAGGI	<---	SD	.829	.155	1.033	.301
ENVIRON	<---	SD	-.315	.220	-1.514	.130
ECONPOL	<---	SD	.949			
WOPOL	<---	WRights	.410	.053	4.964	***
MOBILE	<---	SAGGI	-.047	.088	-.541	.588
BNKACCT	<---	SAGGI	-.592	.099	-8.044	***
MGGI	<---	SAGGI	-.008	.012	-.099	.921

Table 3.10: *Continued*

			Estimate	S.E.	C.R.	P
WOSOC	<---	WRights	.855	.096	11.762	***
WECON	<---	WRights	.858			
GII	<---	SAGGI	.943			
SOCIAL	<---	SD	-.239	.084	-2.586	.010**

Note: (*) $p \leq 0.05$; (**) $p \leq 0.01$; (***) $p \leq 0.001$

Among the three factors of SD (i.e. social, environmental, and economic) only social factors were significantly associated with the SD construct ($\beta = -0.239$, $p = 0.010$) in an inverse relationship showing that investments in mental health policies and plans decreases gender inequality. Furthermore, women's rights, as a construct, was explained by the likelihood of women to exercise their social ($\beta = 0.855$, $p = 0.001$) and political ($\beta = 0.410$, $p = 0.001$) rights. Factor loadings of the SAGGI construct indicated the BANKACCT ($\beta = -0.592$, $p = 0.001$) factor to have the strongest and significant association with the latent construct. The factor was however negatively associated with the SAGG index suggesting that women who have the opportunity to manage money, which indeed is a sign of independence, are more likely to decrease the gender gap disparity between financially empowered men and financially disempowered women (Table 3.10). Additionally, SD construct had a strong impact on women's rights with $\beta = .809$, $p = 0.004$.

Summary of findings

Based on the data analyses, economic capital had a main negative effect on SAGGI while in the presences of built capital and women's rights, it had an inverse effect on gender inequality. However, natural capital had consistent and an inverse relationship with gender inequality reflecting that improvement in natural capital decreases gender gap and improves gender equality. Health and medical expenditures (HC2) were a significant predictor of SAGGI, where increase in expenditures, decreased the gender gap. While mental health did not have a direct effect. Built capital was a significant predictor of SAGGI, where improvements in internet, broadband, improved water source and electricity, positively predicted the gender gap.

Surprisingly, social capital was not a significant predictor of gender inequality. Overall, effects of economic capital, social capital, built capital and natural capital on gender inequality, were moderated by women's rights. Women's rights did not moderate the effects of human capital on gender inequality.

Hence, hypothesis 1, although significant, resulted in main effect of economic capital and SAGGI had an opposite effect than predicted. Hypotheses 2, stating that increase in natural capital, decreases gender inequality gap was fully supported. Hypothesis 3 on with main effect of social capital on SAGGI was not significant, while hypothesis 4 on human capital was partially supported to where only the factor associated with health and education had direct and inverse effect on gender inequality gap. Hypothesis 5 was also significant, but just as the economic capital, increase in built capital predicted increase in inequality. Finally, hypothesis 6 was partially supported where it women's rights moderated the effect of some aspects of capitals on gender inequality.

Results of the assessment of structural model test showed model fitness with favorable indices for sustainable gender equality framework. Environmental factors were negatively associated with women's political rights, in other words increase in natural resources usage indicated decrease in political participation. While mobile phone usage was positively associated with GI index, it was negatively associated to the possibility of having a back-account indicating that women who use mobile phones had better health, were empowered in education and political participation and were more likely to participate in labor force. While they were less likely to open, and manage their own bank services. Women with economic rights were less likely to have malnourished children and economic and political factors were strongly associated with social developmental factors. Overall, a strong association exists between sustainable development and women's rights, while there was no significant association between sustainable development and gender inequality. Also, women's rights were not associated with the gender inequality as measured in this study.

Chapter 5

Discussions

This study examined factors associated with sustainable gender equality using cross-national data of 155 countries. The results of the study indicated that investment in social, economic, and environmental factors had significant effects on the rights of women and girls in political, social, and economic factors.

One of the major findings of this study was that when individually regressed with the gender inequality variable, economic and built capital positively predicted gender inequality. Economic capital representing GNI and GDP without ensuring the rights of women may promote gender inequality. This finding is also consistent with the classical, neoclassical, and Keynesian economics that free-market economy is driven by individual self-interest and thus, encourages predatory competition and excuses exploitation of those who are weaker. Altogether, free-market inevitably has given rise to profit-and-competition-propelling market fundamentalism and, often, with irresponsible innovation of a short-run nature (Hiwaki, 2015). Free-market and globalization have been the factor of increasing gap between those who are rich and those who are poor. Majority of the time, women and children are at the heart of this poverty.

Interestingly, economic capital was significant with inverse relations to SAGGI, when regressed with built capital, social capital, and women's rights (see Table 3.7). This is consistent with literature on social development and economic development that they have been extensively debated to have harmonic effects on development (see Sen, 1999; Midgely, 1995). Midgely (1995) placed importance on economic growth where he argued that, to prevent distorted development, economic development must be harmonized with social development efforts (Midgely, 1995). Sen viewed development as more multifaceted, dynamic and multisystemic, with different development components impacting human well-being at different causal significance levels, with social aspect of development taking a priority role (Sen, 1999).

This study analysis is more consistent with Sen's (1999) perspective of compounded effect as opposed to Midgely's in that, without the built capital, social capital alone did not change the significance level of economic capital. In other words, economic capital and democratic institution alone do not have any significant impact on reducing gender inequality. Other factors such as the built capital facilitate the gender equality efforts. This is also consistent with the sustainability concept where multifaceted approach to development may be more effective than addressing unidimensional construct alone.

Economic capital such as the GDP and GNI and the built capital is the foundation of a community that functions as the delivery system in sustaining infrastructure investments. It may be at the core of determining ways other capitals can be used. Infrastructures, such as policies, buildings, roads, machineries, and digital technology are its physical components that strengthen development works. Built capital promote other capitals to function effectively through networks. They represent advancements in communications technology such as internet and broadband and infrastructure development, such as improved access to water and electricity.

In addition to previous analysis, another interesting find was that social capital was only significant when built capital was introduced in the reaction. This is not a surprising outcome, since social capital has been defined in the past by the existence of social networks (see Putnam 1993; Coleman 1988). As stated in the literature review, in the development literature, social capital has been shown to have important effects in regards to inequality outcomes in education, income, social mobility, social participation, health and well-being, civic engagement, and social solidarity (Carbajal, et. al. 2012; Parks-Yancy, DiTomaso, & Post 2008; Field 2003; Putnam 1993, 2000; Lin, 1999; Coleman 1988). This result can be interpreted as improved broadband, electricity and more time availability because of improved water source have positive effects on gender equality and reduces inequality. Improving physical infrastructures like piped water system, roads, and electricity have been known to

improve development (Putnam, 2004). Gender roles and intersectionality in past research have been reported as further complicating the social dimensions of access to resources and who controls them (Thompson, 2016; Carr & Thompson, 2014). Improved water source may minimize such power struggles and improve gender relations in these countries. Additionally, as predicted, increased social networks through social media and internet, along with increased access to information flow may positively affect women and reduce gender inequality. Interestingly, built capital itself in direct or compounded effect had positive relationship with gender inequality. This may indicate that only when economic and social capital are available, built capital influences gender inequality. Stated differently, wealth of a nation dictates the available resources for its population. An economically sound country can provide the infrastructure necessary to support its population. Also, democratic institutions promote free flow of information to its population. Together, social and economic capital may be the mediators between built capital and gender equality. Further studies need to be conducted to understand this important finding of this study. Analysis on access of built capital and resources to the female population may also shine knowledge in understanding this effect.

The study results on social capital, represented here by the democracy index, had inconsistency in predicting gender inequality in main effect. This is not surprising, as suggested by some (Lin 2001; Niemen, et.al., 2008; Parks-Yancy, DiTomaso, and Post 2008), different groups experience social capital in their own unique ways within their unique contexts. Additionally, the interaction between women's rights and natural capital added complexities to the above findings in the hierarchical regression. Natural capital appears to moderate the effects of economic capital and the built capital as well. This finding is significant in that literature points out that causes and underlying drive of unsustainability and of gender inequality maybe deeply intertwined. Gender inequality and environmental exploitations have both been identified as products of developmental models that promote free market economy and unregulated globalization (Wichterich, 2012). Such development patterns not just promote

but rely on sustaining gender inequalities by exploiting women's labor and unpaid care work. Hence, gender inequality measure, such as SAGGI developed in this study, can make systems accountable by capturing women's contributions to the economy through informal economic participation. The significant association between children's nourishment to women's economic rights further confirms the impact of such measure can have on the health and well-being of women, children and their household and reflect on the emphasis this study makes on accounting for informal labor participation through various methods, such as the one explored in this study of managing their own bank account. Further exploration should be made on bank account and mobile phone usage, since these are indicators with few data availability and less usage in the current context.

The SEM result on sustainable developmental factors were associated with women's rights factors, whereas the latter were associated with the SAGGI measures. This finding is significant in that women's rights mediates the role of capitals on gender inequality. The study results had no direct effect of sustainable development on gender inequality. This confirms the extant literature that economic, social, or environmental investments without concern for women's rights to economic, social, and political factors only perpetrates additional inequality. A recent study by Detraz and Peksen (2016) reported findings from a longitudinal study that involvement of international institutions focused on economic development deteriorates the level of respect for women's economic rights while having less effect on women's political rights. Their results further indicated that this effect of economic investment programs was regardless of the type of political regime and economic wealth of the recipient countries. Societal expectations about rigid gender roles as well as structural conditions, women and girls are among the most vulnerable groups across countries (Detraz and Peksen, 2016). Women's rights factors on economy identified in this study [equal pay for equal work; free choice of profession or employment without the need to obtain a husband or male relative's consent; the right to gainful employment without the need to obtain a husband or male relative's consent;

equality in hiring and promotion practices; job security (e.g. maternity leave, unemployment benefits, no arbitrary firing or layoffs); non-discrimination by employers; the right to be free from sexual harassment in the workplace; the right to work at night; the right to work in occupations classified as dangerous, and the right to work in the military and the police force (Cingranelli, Richards, & Clay, 2014)] are factors that hinder women from actively participating in the labor force. When nearly half the population of these countries lack effectiveness in their rights to contribute towards the country's economy, no matter the investments, countries may fall behind in sound and sustainable economic growth.

Similarly, lack of political rights for equal representations and decision makings, and lack of social rights for equal inheritance, equality in marriage and right to divorce, confer citizenship to children or a husband, to own, acquire, manage, and retain property brought into marriage are factors that are closely associated with patriarchal norms, hinder women's empowerment and decision making, especially when women become widowed or victim of domestic violence or other forms of violence. The study findings here show that the level of women's equality is susceptible to women's rights attained through socioeconomic and environmental changes. If done consciously and morally may promote sustainable gender equality and development. The three pillars of sustainable development: economic, environment and social dimensions have interrelated importance. Stressing on just one over the other degrades the other resources and may hinder growth. Understanding the dynamics of these dimensions further while ensuring the rights of women and girls may help reduce the gender gaps worldwide. An increasing number of studies are indicating that gender inequalities extract high economic costs, leading to social inequities and environmental degradation around the globe (Stevens, 2010).

Overall, the co-occurring challenges of building sound policies and infrastructure to sustainable development while ensuring gender equality have never been more pressing. Research has shown that development without involving women becomes far from being

sustainable while effects of unsustainable patterns of development intensify gender inequality (Neumayer and Plümper, 2007). It is becoming clear that huge economic and social challenges posed by such threats as climate change, pollution, unsustainable consumer patterns and the loss of healthy ecology only exasperates social interactions and promotes inequalities (Intergovernmental Panel on Climate Change, 2013; Rockström et. al., 2009). Human contributions to environmental degradation are expected to exasperate the human networks by impacting the nexus of food, energy, environmental and financial crises. These unsustainable patterns only add to poverty and inequality, especially for more than two-thirds of the world population who directly depend on natural resources for their daily well-being, and create deep threats for future generations (Unmüßig, Sachs and Fatheuer, 2012). The same development trajectories also produce environmental problems, as market actors seek and secure profit in ways that rely on the overexploitation of natural resources and the pollution of climates, land, and oceans. Such market-led pathways are leading in directions that are unsustainable in social and ecological terms, and ultimately in economic ones as well, undermining the conditions for future progress.

Economic globalization by market fundamentalism, together with the digital world revolution in communications and transportation, if unchecked, may accelerate globe-wide movement toward unbalanced power concentration and unification and standardization of humanity and societies (Hiwaki, 2015). While most countries of the world have the domestic resource base to work towards achieving sustainable development, some 50 or so least developed countries or otherwise fragile countries do not. They are too poor, too remote, too conflict-ridden, too bereft of natural resources, or too burdened by other challenges to meet the goals for sustainable development on their own (Unmüßig, Sachs and Fatheuer, 2012). Often, they experience insecurity and armed conflict and the vicious cycle of lack of economic development, environmental degradation, insecurity, and conflict. Majority of the time, women and children are at the frontlines of receiving the brunt of these calamities.

Also, it is important to keep in mind that cultural and social norms, gender roles, and stigmas limit women's voice and participation in civic life. The multiple demands placed on women from professional, personal and family responsibilities are the foremost barriers to women's participation in civic life and civil society. Lack of education, skills and/or confidence contributes to low participation by women in civil society. Unequal levels of decision-making and high levels of gender-based violence often dissuade women from participating in civic activities and civil society even when policies and structures are in place. For instance, Rwanda currently has the highest percent (56%) of female representation in their parliament, yet the country falls in the low human development tier in terms of other capitals and wellbeing measures. A recent country analysis report by USAID (2015), applauded the country for making great strides in developing policies and strategies to support women's equality and empowerment to promote gender equality. Nevertheless, women in Rwanda continue to face many challenges such as lack of power in decision making and intimate partner violence. Women in positions of leadership have less influence than their male counterparts (USAID, 2015). The existing inequalities, persistent lack of voice and agency, and patriarchal norms undermine the 56% representation in the parliament. Translations of policies implemented needs to promote more accountability of outcomes through community investments and bottom-up approach, particularly by civil societies to bring about change.

These recommendations are validated by this study and its unique contributions towards the sustainability adjusted gender inequality standardized measure (SAGGI). Accounting and measuring women's equality through political participation, education, fertility and maternal mortality, communications technology that connect women to the broader world, financial independence and food security for women should be a continuous and consistently demanded to ensure gender equality. Adapting this index to specific, cultural, and contextual spaces that represent the women, girls and children in the community while keeping universal human rights in perspective is crucial and necessary.

Despite, social inclusions in the policies and macro structures in all parts of the world, the challenges lie in maintaining and enhancing the quality of social interactions. The trust in the society, a scarce resource that contributes to economic productivity and human wellbeing, cultural rights and practices that enable people to feel pride in their identities, honesty and accountability of governments and companies impact the dynamics of promoting or hindering gender equality. The ability of people to assert their points of view and pursue their interests in shared public decision-making processes, are critical to women's access to resources and opportunities and to the realization of their rights. Without the trust in the structural consistency to support all those involved and active integrations of democratic values by the government and civic organizations, inequality policies may not alone impact gender equality. Research suggest a decline in social capital in many countries (Dubois & Lasida, 2010). Hence, to ensure sustainable development, any economic, environmental, or political gains must be socially inclusive, and the quality of social interactions at cultural level needs to be enhanced through the promotion of women's rights in political, social, and economic matters.

Despite all the challenges, uncertainties and complexities, pathways towards addressing inequalities, overcoming discrimination, and improving socioeconomic and environmental equality, there are other strong evidences that identify policies and investments that play an important role in lowering inequalities and promoting equal opportunities for all (Dubois & Lasida, 2010). These include improved education and on-the-job-training, particularly for the women and girls; smart policies to promote new industries; administrative reforms and measures to combat corruption; access to modern communications technology and banking; affirmative action for the poor and marginalized; and social safety nets. Finally, consciously creating these alternative paradigms that aims for a sustainable human future needs to be firmly based on a constant enrichment of diversity of cultures and conditions. These grand challenges of current times must be addressed, in ways that fully realize the

human rights of women and girls and help countries to make the transition into sustainable development patterns.

Implications for Social Work

This study has many implications for social work, namely, in policy and research, theoretical enhancement, practice, and teaching. Historically in social work, Jane Addams, the co-founder of Hull House in Chicago, fought social problems in communities at both the micro and macro levels. The idea of hull house was to address community issues with moral compass to ensure the well-being of all members in the community. Ecological perspectives placed persons within the context of their environments and have highlighted the interconnectedness of all through the systems approach to understand the complexities of human well-being (Pillai & Gupta, 2013; Payne, 1997; Rogers, 2006). The shift towards more specialized and clinical health approach in the later part of 20th century shifted the profession towards micro environment of human nature. Having had the journey of micro and macro understanding of human and environment interconnections, Elliott and Mayadas (1996) emphasized the model of using both micro and macro perspective for holistic solutions to human problems. Within the understanding of addressing complex issues facing women and girls, this study comes at a time when the direction towards readdressing macro and micro issues within the understanding of transdisciplinary approach to addressing human needs is currently being highlighted.

The recent move of social work profession towards addressing the so called “grand challenges” through complex data and interdisciplinary and transdisciplinary research frameworks (American Academy of Social Work & Social Welfare, 2016) is promising in addressing gender inequality issues comprehensively. This call for shifting the gear for generalists and specialists to come together in focusing the social work profession towards taking a set of highly ambitious, but achievable goals of 12 key challenges and addressing these comprehensively and aggressively with interdisciplinary collaborations adds a layer of

hope towards reducing the gender gap. This study has many implications that aligns with the grand challenges of reversing extreme economic inequality, building financial capability, harness technology for social goods, create social responses to a changing environment, achieve equal opportunity and justice, ensure health development for all youth, closing the health gap, and end family violence. Because of the challenging nature of addressing gender inequalities in communities with the multidimensional- multilevel focus in addressing sustainable development, this study highlights the intricate weave of societal problems where women and girls are the common factor of finding solutions to many of the challenges.

Also, by bringing women and girls at the center and front of the inequality discussion, this study again re-invigorates the feminist discourse to critical and conscious change. Theoretically, equality policies have been responsive to the changing nature of the theoretical debates on equality through various waves of Feminist activism in society. Feministic theories and practitioners usually promote equality yet there are many debates out there about inclusion of environmental justice amid this debate. Bringing forth ecofeminism and empowerment perspective in addressing equality issues for women, it calls on social workers, policy makers and practitioners to address gender inequality in all intersections of society in physical and contextual spaces, to eliminate the gender gap.

Also, the most fundamental debate around equality has centered around the question of to what extent should equality be defined in terms or should it be institutionalized or deinstitutionalized? Or are these questions any relevant? Consequently, the fundamental need is to understand the structural and contextual discourses that perpetuate inequality. Yet, these questions and debates need to be consistently brought up in social work classrooms. Also of importance is, highlighting policy research, advocacy, and service learning opportunities for students in social work, in gender issues. Incorporating local and global understandings of gender issues will further enable students to understand the holistic system of intricacies involved in resolving societal issues (Small, Nikolova & Sharma, 2016) for women and girls.

Finally, a social work definition of social justice goes beyond an abstract thinking of what a just society should look like, to include social actions of advocating, intervening, evaluating, and creating just environment. For sustainable development outcomes, an ethical commitment to social justice by social workers is therefore a good starting point with the Global Agenda for Social Work and Social Development (Higgs, 2015; Lombard, 2015). Social work, as a profession advocating for human rights and social justice, has a responsibility now to do more than simply ameliorate the impacts of environmental change, it needs to become part of the global movement in addressing environmental issues and direct people towards a sustainable future (Jones, 2013). Furthermore, understanding the impact of new developments and directions the world is shifting towards; ethically and consciously directing those impacts towards greater social good for people now and in the future, by including women and girls at the discussion table, must be prioritized in the profession and the broader contexts.

Strengths and Limitations of the Study

This dissertation study is important for social policy educators and gender researchers because it considers the complexities of gender inequalities manifested in social, economic, and environmental disparities among men and women in both developed and developing countries. However, this study has several limitations that should be considered when interpreting the results. First, performing secondary data analysis of the World Bank data collected at macro-level reflects macro-level forces such as poverty, economic, environmental, and social lack of capital, societal opportunities, and other constraints that many women and girls face in their personal lives, in their immediate socio-cultural-environmental contexts. Despite its cross-national scope of the study, this study makes contributions towards promoting national level policy, practice and research initiatives that has the potential to impact women's rights and gender equality, globally.

Also, the macro-level data is aggregated data and that pose difficulties in making any inferences beyond the national scope. Also, the surveys collected extensively at national

levels, although valuable in promoting policies and programs, it is important to keep in mind the varied research expertise of the data-collection teams in each country. This might have affected the quality of the data and hence, must be kept in mind when interpreting the results of the analysis presented here. The probability for an ecological fallacy can occur while attempting to make causal inferences when investigating social relationships holdings that effects higher-level organizational units (governments, economic and political systems, and organizations, etc.) on lower level group members (i.e. women).

One of the methodological challenge in this study has been the inclusion of 155 countries at various levels of human development from very low to very high status. In terms of gender equality, geography and economy, consumption patterns, democratic values, and social-cultural contexts, these countries not only differ from one-another, but also are diverse within their own national contexts. The data set in use provide an aggregate measure of these factors and posed challenges in data analysis. For example, although some of the countries like Saudi Arabia and Bahrain have high levels of development, their gender right policies are still in nascent phases. These are also countries that use higher amounts of fossil fuels and withdraw water at many folds than the capacity of their systems. These variables may have impacted the variances in data analysis.

Another important factor to note is in including countries with lower levels of gender inequality. Including the 46 countries with high-human development and higher levels of gender equality in the analysis was of concern due to their influence in the outcome of this study and may undermine the important significance of the scope of gender inequality in the established framework. However, the decision to keep these countries was made on the very premise that all countries are at various levels of development. Most importantly, the Sustainable Development Goals (SDGs), unlike the MDGs, are commitments made by very high human development countries as well. Hence, theoretically, it justified to keep them in the analysis. As

such, this study is unique in its incorporation of all human developmental level countries to fit in the sustainable gender equality framework.

An additional limitation of the study is the cross-country comparison. Comparisons of countries at different levels of development pose a potential problem because of the differences in consumption and income included in the total consumption expenditures. For example, the food and nutritional value share of a household in rich and poor countries are substantially different, favoring bigger countries. Although the current study does not suggest that there are inner-country differences in women's outcomes, the analysis does not provide information regarding similarities and trends in common challenges faced by "rich" and "poor", for instance, of people living in low income communities.

Finally, the use of variables that are collected for the purpose other than this study limits any inferences that can be made with strong confidence. The data used in the analysis was not collected to address the research question of the study. Additionally, some of the variables were analyzed as "proxies" when discussing their effect on gender equality. Therefore, reliability and scale development could not be performed in a way to address the real magnitude and measure of the problem of this dissertation. Also, the data imputations and transformations to address uses such as outlier may have undermined or exaggerated the regressions and models tested in this study. Yet, the methods such as SEM guided by theoretical methodology as presented in this study can still be effective in creating an overview framework for sustainable gender equality using the type of data put together for this study. Hence, despite the type of data, focusing on maximizing the prediction and the theory-testing was more appropriate than making any causal inferences in this study.

Major strength and contribution of this study lies in the highlight of gender justice, intergenerational justice, and environmental justice. In the past, several measures for gender have been devised, such as Gender Empowerment Index that failed to account boys and men, Gender Gap Index that focused on equality and not necessarily on empowerment. None of

these measures accounted for informal labor force participation, communications technology, and children under the age of five while accounting for boys and men. The adjusted standardized index of MGGI and SAGGI both promote gender inequality accountability for additional generation and most importantly incorporates built and environmental factors. By including these, this study makes a strong case for including girls and women in future development agenda not just as beneficiary, but as empowered actors. Although further work is needed to strengthen this index, this is a beginning for accounting women in the next generation of policies and programs. As explored in the literature, policies and measures that truly address women's empowerment and equality can have significant impact on the rest of the community. While applying the male-centered measures on women, girls and children have proved detrimental in promoting discriminations and exclusive, rather than inclusive global system.

Recommendations and Conclusion

Finally, the issue of prospective responsibility towards girls and women of current and future generations who are most at risk, either because they are currently weak, poor, or vulnerable, or may have the possibilities to become so in the future, calls for a rethinking of the issue of equality and development. Sustainable development strategies clearly offer the opportunity to build an appropriate framework that can envisage the system and its dynamics in the light of the transdisciplinary set of values. The theoretical framework developed in this study and factors predicting sustainable gender equality needs to be understood in increased details in applications at global, regional, national, and local scales. However, further research needs to be conducted to promote an evidence-based approach using phenomenology to guide towards answering questions posed earlier in regards to sustainable gender equality.

For a, comprehensive gender analysis, this study further recommends piloting instruments in different regions and communities around the globe to establish effective scales that captures gender inequalities. Each region, each country, each city, and each rural locality

requires its own situation analysis, asking questions such as: How can we end extreme poverty and inequalities in all its forms? How can we reduce child malnourishment and improve household well-being? How can we reduce disparities across gender and socio-economic groups? How can we educate and empower our youth, both girls and boys, to promote and sustain gains made in equality and justice? What are the locally and regionally available renewable energy resources to promote sustainable livelihoods? What are the local vulnerabilities that exploit women and girls? What networks and civic organizations can promote the voice and agency of women and girls? How do prevailing fertility rates and population trends impact sustainable development? What measures need to be assessed to prevent exploitations of natural environment and resources of communities to ensure inclusion and equality of those who are vulnerable, such as women and girls? And so forth. These are questions that still need to be answered and more importantly data that capture these at micro level needs to be collected to promote sustainable justice for women and girls. Particularly of importance is the sex-disaggregated data that addresses equality issues for men and women within their own and interrelated systems or place of existence can have directed and sustainable development impacts.

It is particularly true now, where communities thrive in dimensions in physical surroundings and beyond, in spaces defined by virtual environment and technologies that connect people across the globe. Identifying specific dynamics and networks of those communities and understanding how their use of different resources and channel them to their benefit needs to be the focus of sustainable development. However, within the justice framework despite the similar interest or culture of group members, delineating socio-demographic variables such as class, race, age, and gender is further important.

Moreover, community level interventions with best -practices and evidence based strategies needs to be established. Projects that invest in health disparities, education parities and sustainable livelihoods with intervention tools such as smart phones and social media that

are becoming integrated in social lives needs to be kept in mind. For example, the worldwide accelerated conversion to a low-carbon energy system and the upgrading of technologies of smallholder farmers (USAID, 2015), using smart phones for banking and microenterprise projects may promote sustainable well-being for women and girls.

Men also need to be part of the gender equality pathways. The differences in experience, skills and confidence between male and female citizens need to be overtly addressed through specific interventions from the start (USAID, 2015). To further women's empowerment, trainings, especially to youth, men and women alike, on the core characteristics of human rights and the meaning and benefits of gender equality to the household and society must be promoted.

At the core of these developments and investments, if freedom to be and to do is hindered, they only perpetrate inequality (Sen, 1999). The values of freedom and equality are fundamental and must be promoted with the acceptance of liability for those who are at risk or vulnerable, particularly women and girls. They are the equal wheels in the vehicle that promoting justice for now and ensuring the same for the future generations. Accountability in terms of retrospective responsibility and prospective responsibility of maintaining freedom and responsibility that define ethical approach to economic, environmental, and social interactions must be the focus of any development. (Dubois & Lasida, 2010; Ricoueur, 2005; Jonas 1979). Making reparations with the past destruction and showing responsible and moral actions for the future generations can protect and promote justice for future generations. Hence, for sustainability of gender equality, equity approach to propel women in social, economic, and environmental dimensions by creating opportunities and promoting equality and fairness, while creating policies and practices that are proactive in protecting their future development, rights and integrity should be the way forward.

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Bonita B. Sharma, completed her Masters of Science in Social Work and PhD from the University of Texas at Arlington, School of Social Work. Her research interests involve a critical concern for gender inequality and sustainable justice. Her previous works have been in policy research on macro structural factors and their critical role in gender inequalities; global social development; local community support and sustainable livelihood and their impact on physical and mental health. Bonita Sharma also has her interests in community based participatory research and has been involved closely with community based non-governmental organization (NGOs) that focuses on rural development initiatives in South Asia. With her collective background, locally and globally in women's issues under various contexts, she hopes to expand the sustainability feminist literature through applications of interdisciplinary and transdisciplinary intervention techniques. With this she hopes to promote sustainable communities that respect the rights, equality and integrity of girls and women. Bonita Sharma is also an educator and have taught courses in research and community macro practice.