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COST OF GENDER GAPS IN THE AGRICULTURAL SECTOR: THE CASE OF KENYA AND RWANDA

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Abstract

The objective of this study was to analyse the cost of the gender gap in agriculture in both Kenya and Rwanda. Data were collected in Makuyu in Muranga County in Kenya and in Musambira in the Southern Province of Rwanda. From the descriptive statistics, the study found that there are more and bigger gender gaps in Kenya than in Rwanda. From the analysis, it has emerged that the cost to women for not using the variables considered as necessary for agricultural production was smaller as compared to the one for men. In terms of benefits for using the above inputs, men benefit more than women. Having irrigation was the only indicator that showed

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any significance in influencing the cost of gender gap and this could be due to the limited number of cases in the study. The information received from the qualitative data supports most of the observations made in the quantitative interviews. Although this study is based on a small sample, it still shows that gender gaps are costly to the farmers and to the economy in general. It is, therefore, important on the part of the governments of Kenya and Rwanda to put in place measures to sensitize men that gender inequality is costly and that by reducing it, both men and women benefit.

2.1 Introduction

While over the recent years women in the East and Horn of Africa regions have made some gains in the domains of political rights and empowerment, education, health, and access to economic opportunities, gaps still remain in many areas. Except in Rwanda and a few other countries where affirmative action has yielded results, fewer women participate in formal politics than men and are underrepresented in the upper echelons of power. Although gender disparities in primary and secondary school enrolments are narrowing, the gender gap at higher education,

tertiary and university education remains unacceptably wide in most of the countries. Women are more likely to die earlier relative to their male counterparts, especially in childhood and during their reproductive years. Where rural women are employed, they tend to be segregated into lower paid occupations and are more likely to be in less secure forms of employment, such as seasonal, part-time or low-wage jobs. Women are also more likely than men to work as unpaid family labourers or in the informal sector, to farm smaller plots and grow less profitable crops, operate in smaller firms and less profitable sectors, and generally

earn less. These gender disparities have serious implications for the economic and social wellbeing of nations.¹

Economic research done by the World Bank (2009) and the International Monetary Fund (2010a), for example, have demonstrated that the gender gap costs the world billions of dollars in national economic growth each year. Furthermore, research involving a cross-section of 40 economically poor or rich countries shows that there is a strong relationship between women's economic and social status and the overall economic growth. Women's lack of education, health care, economic and social opportunities, lack of access to the full potential of agricultural productivity throughout the food chains, both absolutely and relative to men, inhibits economic growth.

Agriculture remains the backbone of most economies in Sub-Saharan Africa, providing income, food and nutrition security and employment. Women make up between 50-90 per cent of the agricultural labour force in sub-Saharan Africa and provide half of the world's food production. In most developing countries women produce between 60 and 80 per cent of the food supplies. Despite their significant role in agriculture and household food security, women farmers have not received the support they require to thrive. Women continue to be regarded as home producers or assistants on the farm, and not as farmers and economic agents in their own merit. Women receive a small fraction of assistance for agricultural investments which amounts to less than ten per cent of small farm credit and one per cent

of the total credit disbursed to the agricultural sector.

Women are often not recognized as farmers in their own right, even within their own families and communities - let alone by governments or donors. There is a lot of rhetoric that mentions women as being the majority of farmers. However, this is all that it remains as, rhetoric, since the needs and rights of these women "farmers" are overlooked in policy, legislation, research, extension or any form of support extended by governments or their agencies. As a result, women smallholder farmers are desperately short of credit, technical advice, relevant research, appropriate infrastructure and technology, secure and adequate land holdings, and other public goods. Asymmetries in ownership of, access to and control of livelihood assets (such as land, water, energy, credit, knowledge, and labour) negatively affect women's food production. Women are less likely to own land and usually enjoy only user rights, mediated through a male relative. Insecurity of tenure for women results in lower investment and potential environmental degradation; it compromises future production potential and increases food insecurity. Interestingly, research findings by Saito et al. (1994) reveal that with equal access to land and inputs, African women produce 20 per cent more than men. However, African women are not getting the necessary support to access land, extension and credit services. Research by Action Aid International revealed that in Uganda, women receive only nine percent of agricultural credit; in Malawi only seven percent of female-headed households receive extension support (compared to 13 percent for male-headed); in Kenya, private sector extension services target farmers with

¹*Kiriti and Tisdell (2004).*

better quality land and who grow high value crops, who tend to be male farmers.²

To compound the problem, asset ownership is unequal among the genders along the agricultural value chain. Assets are unequally distributed between men and women in agricultural households. Agricultural assets include tangible assets such as land, livestock and machinery and inequality in the ownership and control of these assets prevents agriculture from delivering income, nutrition, food security and empowerment to women and the economy as a whole. Access to, control over, and ownership of assets are critical components of well-being. Productive assets can generate products or services that can be consumed or sold to generate income. Assets are also stores of wealth that can increase (or decrease) in value. Assets can act as collateral and facilitate access to credit and financial services as well as increase social status. Flexibility of assets to serve multiple functions provides both security at times of emergencies and opportunities in periods of growth. Access to, control over, and ownership of assets including land and livestock, homes and equipment, and other resources enable people to create stable and productive lives. Increasing the nexus of control over assets also potentially enables more permanent pathways out of poverty compared to measures that aim to increase incomes or consumption alone.

Most countries have committed to dealing with this gender disparity by adopting gender mainstreaming in their policy implementation and programming. Gender mainstreaming is being carried out by government, private

sector and civil society actors in a complementary manner. FAO (2011) argues that it is important to address gender gaps in agriculture and rural employment. The Report indicates that the agriculture sector has been underperforming in many developing countries mainly because women do not have equal access to the resources and opportunities for them to be more productive. Agricultural development programs are supposed to deliver income, nutrition, food security and empowerment outcomes as well as agricultural growth. Interventions that do not address these inequalities reproduce and reinforce them. FAO (2011) contends that compared with their male counterparts, women:

- operate smaller farms, on average only half to two-thirds as large;
- keep fewer livestock, typically of smaller breeds, and earn less from the livestock they do own;
- have a greater overall workload that includes a heavy burden of low-productivity activities like fetching water and firewood;
- have less education and less access to agricultural information and extension services;
- use less credit and other financial services;
- are much less likely to purchase inputs such as fertilizers, improved seeds and mechanical equipment;
- if employed, are more likely to be in part-time, seasonal and low-paying jobs; and
- Receive lower wages for the same work, even when they have the same experience and qualifications.

The gender gap imposes real costs on society in terms of lost agricultural output, food security and economic growth. There is evidence that closing the gender gap matters for both economic growth and the improvement of overall development

²Action Aid (2010).

outcomes. This study analyses the cost of gender gaps in the agricultural sector and provides policy recommendations to close these gaps.

2.2 Literature Review

Gender gap refers to the differences between women and men, especially as reflected in social, political, intellectual, cultural, or economic attainments or attitudes. Meinzen-Dick, et.al (2011) offers a conceptual framework for understanding the gendered pathways through which asset accumulation occurs, including attention to not only men's and women's assets but also those they share in joint control and ownership. This model depicts the gendered dimensions of each component of the pathway in recognition of the evidence that men and women not only control, own, or dispose of assets in different ways, but also access, control, and own different kinds of assets. The framework generates gender-specific hypotheses that can be tested empirically:

- i) Different types of assets enable different livelihoods, with a greater stock and diversity of assets being associated with more diverse livelihoods and better well-being outcomes;
- ii) Men and women use different types of assets to cope with different types of shocks;
- iii) Interventions that increase men's and women's stock of a particular asset improve the bargaining power of the individual(s) who control that asset; and
- iv) Interventions and policies that reduce the gender gap in assets are better able to achieve development outcomes related to food security, health, and nutrition and other aspects of well-being related to agency and empowerment. The authors discuss the implications of

these gender differences for the design of agricultural development interventions to increase asset growth and returns to assets as well as for value chain development which this study borrows a lot from.

Bandara (2012) argues that although Africa's GDP has been rising since 2004, it has not utilised all its growth potential, especially where women are concerned. Their exclusion, the author argues, could drag the economy backwards leading to reduced per capita income growth and increase in poverty. The study identifies gender gaps in labour force participation and in the stock of educated labour in Africa and Sub-Saharan Africa and argues that although these have been declining in the last decade, they have growth implications. The study found that in Africa, female labour with no education had a negative effect on output and that the gender gap in labour with no education negatively affected output. In other words, there were huge losses due to gender gaps in female effective labour.

Ngwira and Mkandawire (2003) did a cost benefit analyses of increasing men's and women's literacy and access to agriculture services. The study shows that there are substantial net economic benefits in implementing the plans. The analyses show that there are significant incremental net economic benefits of doing this while closing the gender disparities in access to these services. With these benefits, GDP can grow at a rate that is at least twice the average annual growth rate of the past five years.

Quisumbing and Pandolfelli (2010) address the gender gap by reviewing efforts to tackle the needs of poor female farmers in Sub-Saharan Africa. The authors contend that

women lack productive resources and have low levels of human capital. The results are inefficiencies in intra-household allocation of resources and the resulting interaction between economic factors and gender roles act as further constraints to improvements in productivity and well-being in Sub-Saharan Africa. There is, therefore, a need to close the gender gap in both human and physical resources.

Fontana and Paciello (2009) examine the links between gender equality and rural employment for poverty reduction by constructing a gender analytical frame work to interpret differentiated patterns and conditions of work across regions, socio-economic contexts and policy environments. The study found that women tend to be the main producers of food crops such as maize, rice, cassava and other tubers while men are more engaged in commercial farming and produce cocoa, cotton and coffee for export. Most non-traditional agricultural exports production is male dominated. Women also tend to manage smaller plots than men, for example, in Mozambique. In non-traditional agricultural exports women tend to work in more precarious positions than men with no social protection and only seasonal contracts. Women are exposed to sexual and verbal abuses, for example, in Kenya. The authors also found that women are involved in small-scale low returns trading and they trade only in particular commodities (e.g. perishable fresh produce for domestic markets), whereas men more likely are involved in trading for international markets (e.g. Uganda, Tanzania, Ghana). Also they found that large shares of women work as domestic helpers (e.g. South Africa, Mozambique, and Senegal). In Uganda

and Ghana, women are clustered into wholesale/retail trade and manufacturing, while men's activities range across public administration, trade, construction, transport, and mining.

In agriculture, the study found that women are generally paid less than men in Sub-Saharan Africa and these vary according to the sector. For example, in Kenya, agricultural wage employment is such that women's hourly wages are 93 per cent of men's. According to the study, differences in daily earnings may reflect gender differences in hours worked as well as differences in remuneration. Women work longer hours than men in most developing countries when both paid and unpaid work is taken into consideration. However, much of their work remains undervalued because it is unpaid. Women often spend less time on average in paid market work than men, whereas they are largely responsible for water and fuel collection, domestic chores, child care and care of the sick and elderly. The authors also contend that in most countries women tend to be more vulnerable workers than men, due to the fact that they face many biases in both rural labour markets and within households, and therefore have less opportunities to diversify into better quality employment than male workers. In some family settings, they may also have weaker claims over what they earn.

2.3 Conceptual Frameworks of Analysing Gender Gaps

Various methods exist for analysing gender gaps. This section looks at some of these.

2.3.1 Global Gender Gap Index

The Global Gender Gap Index was introduced by the World Economic Forum in 2006 and is a framework for capturing the magnitude and scope of gender-based disparities and tracking their progress. The Index benchmarks national gender gaps on economic, political, education and health criteria, and provides country rankings that allow for effective comparisons across regions and income groups, and over time. The rankings are designed to create greater awareness among a global audience of the challenges posed by gender gaps and the opportunities created by reducing them. The methodology and quantitative analysis behind the rankings are intended to serve as a basis for designing effective measures for reducing gender gaps.

The Global Gender Gap Index is designed to measure gender-based gaps in access to resources and opportunities in individual countries rather than the actual levels of the available resources and opportunities in those countries. It evaluates countries based on outcomes rather than inputs. The aim is to provide a snapshot of where men and women stand with regard to some fundamental outcome variables related to basic rights such as health, education, economic participation and political empowerment and it ranks countries according to their proximity to gender equality rather than to women's empowerment. The Global Gender Gap Index examines the gap between men and women in four fundamental categories (sub-indexes): economic participation and opportunity, educational attainment, health and survival and political empowerment.

2.3.2 The Cost Benefit Analysis (CBA) Methodology

The Cost Benefit Analysis (CBA) in gender analysis is a methodology for estimating the costs and benefits of interventions that would reduce gender inequalities in the agricultural sector. It can also be used as a methodology for estimating net incremental social benefit of reducing gender inequalities in the main activities. The estimated costs and benefits of the interventions can be used as an input in estimating the incremental social benefit of reducing gender inequalities in the agricultural sector.

The CBA methodology is based on a gender analytical approach. The gender analytical approach is achieved through the application of various tools to diagnose the differences between men and women regarding their specific activities, conditions, needs, access and control over resources, and their participation in and benefit from development and decision-making processes. Gender analysis entails first and foremost collecting sex disaggregated data and gender sensitive information about the population concerned. It is a prerequisite for gender sensitive planning for the advancement of women. In applying the gender analytical approach to the CBA, attention should be given to choosing the technical, institutional and managerial arrangements of the activities of projects that make them gender responsive. And in doing the social valuation of the benefits and costs, premiums should be applied to those benefits that accrue to women.

The engendered CBA methodology is based on the traditional CBA analysis, but goes beyond to do an economic and also more

importantly a social analysis. The main stages of a CBA are:

- Project (intervention) identification and this involves defining the goals and goal targets of the intervention, finding the current levels of the goal(s) and the relationship between inputs and goals. Other issues are establishing the institutional or managerial and commercial aspects of the intervention. This information helps to identify costs and benefits and to mitigate data problems. The intervention being investigated here is reducing gender disparities in the agricultural sector (e.g. access to agricultural inputs).
- Identification of project costs and benefits. The costs are mostly inputs required to achieve the outputs, but can also include losses or foregone benefits due to implementing the intervention. The benefits could be increases in outputs or reduction in input use or cuts in output losses.
- Financial valuation of cost and benefits. For financial analysis this is done using market prices.
- Economic valuation of costs and benefits. The economic analysis stage aims to correct for distortion in market prices. Some costs are re-valued e.g. prices of traded goods are adjusted to reflect parity prices and using adjustment factors like for example for exchange rate distortions, and freight and insurance costs. Our study can go up to the financial stage.
- Social evaluation of costs and benefits. The stream of benefits and costs is then discounted to take care of society's rate of time preference and the opportunity cost of investments. The results are summarized using either the Net Present Value, cost/benefit ratios or the internal rate of return.
- Sensitivity analysis. This stage varies those parameters whose probability of changing is known. Or it can be done to search for the levels in variables for

which the project is viable or not (break even analysis). The variables that can be changed are costs and benefits, their prices, or the discount rates, and delays in realizing the benefits of the projects.

- The last stage is the selection of project(s) to implement.

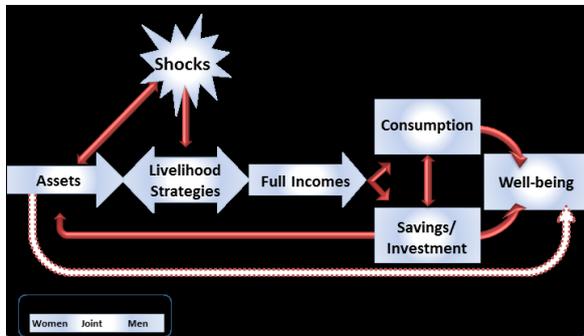
CBA is based on the theory of welfare maximization and efficiency of economic agents. However, when this is done for governments or by the government, some of the assumptions of these theories may not hold. CBA also has the disadvantage of being partial analysis, in that it is assumed that not everything changes as the project is being implemented. When the changes suspected contribute negatively to welfare, the benefits of the intervention could be overstated. This problem is handled through extra analyses such as an environmental audit or revaluation of benefits using social goals. Although doing CBAs on a project basis actually helps to contain data problems, CBAs nevertheless still require an amount and quality of data that is not easily available in some countries. This study uses the CBA to analyse the cost of gender gaps in agriculture in Kenya and Rwanda.

2.3.3 The Gender, Assets, and Agricultural Programs Framework

The Gender, Assets, and Agricultural Programs (GAAP) framework (see Figure 1) shows the links between assets and well-being while making clear that gender relations influence the constraints and opportunities that occur in each pathway. In the framework, each component is gendered. Women and men often have separate assets, activities, and consumption and savings or investment strategies, but households can also have joint

assets, activities, and consumption strategies, among others.

Figure 1: Gender, Assets and Agricultural Programs Framework



Adopted from Meinzen-Dick, et. al. (2012)

The shading in this and all other components of the diagram according to Meinzen-Dick, et. al. (2012) reflects that within a household there are assets that are held by women, some that are held by men, and others that are owned and/or utilized jointly. The distribution of assets in a particular household will influence how the household and its members use their assets to further their livelihoods and improve their well-being.

The livelihood strategies represent decisions that individuals and households make about how to invest their assets in productive and reproductive activities in order to generate expected returns. The livelihood strategies available in a particular area will depend on many of the contextual factors (agro ecology and market access, for example) and may be heavily influenced by gender roles. Whether men and women will be able to pursue the available strategies will further depend on what assets those livelihood strategies require, and on how “household assets” are allocated across different household members to enable them to engage in specific livelihood strategies.

In some cases men and women pursue different livelihood strategies; in other cases, these may be pursued jointly – for instance, as “family farms” or family businesses. In addition to the arrow from assets to livelihood strategies, the diagram shows a reverse arrow from livelihoods strategies to assets, to capture how some assets like social capital (or even natural capital like soil fertility) can be built in the process of carrying out livelihood strategies rather than as a discrete investment decision at the end.

The actual returns to different activities may also be affected by shocks (negative or positive). Weather, disease, violent conflicts, theft, and even sudden policy changes represent potential shocks. Shocks can also affect a wide area at a given time (so-called covariate shocks, such as weather shocks or widespread food price increases), or could be specific to the household (death or illness of an income earner) or an individual (divorce or abandonment).

How are shocks gendered? First, men and women experience shocks differently, depending on their different roles and responsibilities. Men who own livestock are more directly affected by cattle rustling or by drought that reduces the availability of good forage; women who keep poultry will be more affected by diseases such as avian influenza. Human diseases are likely to have a disproportionately large effect on women, as women are often affected not only by their own illnesses and typically have lower access to healthcare, but also responsible for taking care of other sick family members.

In addition to general shocks, there are also shocks that specifically affect women and lead

to loss of their assets and a threat to their livelihood strategies. For example, divorce or death of a husband can lead to women losing their assets, especially in cases where marriage is governed under customary laws that do not protect women's rights to property. The livelihoods strategies and shocks result in a household's full income, which is defined as the total value of products and services produced by the household members, some of which are consumed directly and others sold for cash or traded for other goods or services. The concept of full income also includes leisure time of household members. Because it is more likely for women's time to be devoted to nonmarket or reproductive activities—including growing food consumed at home, caring for children, and caring for the ill—measures of income that do not take into account the value of time will tend to underestimate women's contribution.

A large body of evidence shows that, in many parts of the world, men and women spend money differently: women are more likely to spend the income they control on food, health care, and the education of their children. Asset ownership, in particular, is among the factors that may influence women's control over income and increase their bargaining power in household negotiations. How savings are used or invested is also gendered. In case of a severe shock, it is important to ask whose savings or assets are being liquidated to keep the individual or household consumption levels and whether there will be other mechanisms for those who lose to replace their assets. All these have a bearing on the wellbeing of households and individuals.

2.4 Research Methodology and Process

This study used both quantitative and qualitative approaches to achieve the study objectives. It involved desk study and field work. The desk study reviewed available data on gender gaps in selected sectors, including agriculture. In addition, the study literature also reviewed underlying causes of gender gaps across sectors, their costs and implications. The literature reviewed included local and international sources and included World Economic Forum (WEF); Global Gender Equality Watch; the World Bank, UN Women Strategic Plan 2011-2013 and the Kenya National Bureau of Statistics (KNBS), among others. Field work was carried out to collect primary qualitative and quantitative data on relevant gender gap indicators. The data collection process was carried out in Musambira in the Southern Province of Rwanda and in Makuyu in the Murang'a County of Kenya.

(a) Demographic Characteristics of Respondents

Table 1 presents an overview of the demographic characteristics of the population interviewed in Kenya and Rwanda using the in-depth questionnaire, a total of 20 (10 females and 10 males) respondents were interviewed in Kenya and 20 (10 females and 10 males) in Rwanda. These two (Murang'a and Musambira) were purposively selected since this was meant to be a pretesting stage of the tools for the main study which is to take place in 2015 in Kenya, Rwanda and Malawi and these two sites will not be in the main study.

Table 1: Demographic Characteristics of Respondents

		Kenya	Rwanda
Variable	Variable type	Frequency %	Frequency %
Sex	Male	50.0	50.0
	Female	50.0	50.0
Marital status	Married monogamous	68.0	94.4
	Widow/Widower	24.0	5.6
	Divorced	4.0	0
	Never married/single	4.0	0
Literacy	Can read and Write	80.0	83.3
	Can neither read nor write	20.0	16.7
Highest level of education	Never attended school	20.0	11.1
	Primaryschool-Std1-4	35.0	44.4
	Primaryschool-5-7/8	10.0	33.3
	SecondarySchool-Form1-4	10.0	5.6
	College/Polytechnic	25.0	5.6

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

From Table 1 it is clear that there are more Kenyans with higher education i.e., secondary and tertiary education than Rwandese. However, there are more people in Kenya who have no education (20 per cent) compared to only 11.1 per cent from Rwanda. Also, there are more Kenyans who are illiterate (20 per cent) than Rwandese (16.7 per cent). Also, it looks like Rwanda people value monogamous marriages more than Kenyans do since there were 94.4 per cent of Rwandans who were in monogamous marriages as compared to only 68 per cent Kenyans.

(b) Focus Group Discussions

Group Discussion of Mixed farmers

A total of 12 farmers, 6 men and 6 women attended the FGD in Rwanda and actively participated in the discussions. While in Kenya a total of 9 farmers 4 men and 5 women attended the mixed farmer FGD.

(c) Oral testimonies

Only women participated in the oral testimonies. In Rwanda they included a 52 year old widow and a 45 years old lady who was married. In Kenya a 70 year old widow

and another 70 year old lady who was married were interviewed.

(d) (Institutional)

The Deputy County Director of Crop Management in Murang'a County and the Deputy County Director of Livestock Management in the same County participated in the institutional survey in Kenya.

2.5 Results and Discussion

2.5.1 Differentials in Land Acreage by Gender

From the in depth face to face questionnaire, Table 2 shows that women have equal if not more access to land as men in both Rwanda and Kenya. However, men in Kenya own larger pieces of land as compared to Rwanda where ownership is equal for the larger pieces of Land. It is also clear that in Rwanda, there are more males who have 0-1 acres of land, compared to only 28.6 per cent females in that category.

Table 2: Differentials in Land Acreage by Gender

Acreage	Kenya		Rwanda	
	Male (%)	Female (%)	Male (%)	Female (%)
0-1	50.0	50	71.4	28.6
1.1-2.5	57.1	42.9	33.3	66.7
2.6-3.7	33.3	66.7	33.3	66.7
3.8+	66.7	33.3	50.0	50.0
	P-Value =0.762		P-Value =0.503	

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

Data from the qualitative surveys also supports this information. In the mixed FGD conducted in Kenya the participants reported that 80 per cent of land was owned by men while women owned only 20 per cent. The two women interviewed also confirmed that in Kenya land is owned by men due to the fact that land is passed from the parents to the sons. In Rwanda in both FGDs participants reported that land ownership was equal between men and women. After the change in the Constitution in 2010 in Rwanda women were given equal ownership to land as reported by

one of the ladies during the oral testimony interview. However, in some cases men still dominate decision making on how to use and even sell the land according to some participants in the women only FGD conducted in Rwanda.

All women who were interviewed both in Kenya and Rwanda were either married monogamous or widowed. Women in Rwanda seemed to have more control over land as compared to those in Kenya. They reported as either owning the land or partially owning and leasing, while in Kenya they either owned land or not and even in the case where one was widowed she said she did not own land as shown in Table 3. The women in Kenya who did not own land reported the land as either being owned by their husbands, father in laws or father including those who were widowed. African Women's Studies Centre (2014b) reports the same finding in the study on Women Experiences on Food Security in Kenya.

Table 3: Land Ownership by Marital Status

Marital Status	Kenya			Rwanda		
	Owns land (%)	Does not own land (%)	Partially owned/ leasing (%)	Owns land (%)	Does not own land (%)	Partially owned/ leasing (%)
Married monogamous	42.9	57.1	0	44.4	0	55.6
Widow	66.7	33.3	0	0	0	0

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

2.5.2 Differentials in Productivity per Acre by Gender

Productivity was derived by dividing the value of output (quantity times the price of the output) by the acreage. In terms of productivity, as shown in Table 4, men are more productive as compared to women, the majority of whom produce less than 20 Shillings per acre both in Rwanda and Kenya.

In Kenya this differential accounts for 100 per cent of all the women interviewed during the pre-test. It is also seen that 71.4 per cent of males in Rwanda produce 21-50 shillings per acre compared to only 28.6 per cent of females in that country. However, productivity per acre is not significant in Kenya because the P-Value is more than 0.05, while in Rwanda it is significant because the P-Value is

less than 0.05. This information was derived from the in depth questionnaire.

Table 4: Differentials in Productivity per Acre by Gender

Productivity per acre in Shillings	Kenya		Rwanda	
	Male (%)	Female (%)	Male (%)	Female (%)
0-20	47.4	52.6	22.2	77.8
21-50	0	0	71.4	28.6
51+	100	0	100	0
	P-Value =0.230		P-Value =0.030	

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

In the qualitative bit of the survey, the majority of the respondents reported that men controlled most of the produce and the money from the sale of the produce and this could explain why women's productivity is low in both countries. In both countries women reported spending more time in the farm as compared to men and also had to do other household chores. Women, especially in Kenya, said that men see them and the children as a source of cheap and free labour, especially for the cash crops where women work hard on the farms but the bonuses are received by men who are the ones registered by the factories as owners of the farms. These findings accord with the findings of Kiriti and Tisdell (2004) and Kiriti (2003) in their studies of Nyeri County in Kenya.

2.5.3 Differentials in Value of Output by Gender

Though not statistically significant the value of output by gender varied with men having the highest value of output. In both Kenya and Rwanda it's only men who get more than 300,000 Kenya shillings and more than 500,000 Rwandan Francs for their produce in Kenya and Rwanda respectively, while women only make between 0-100,000, with the

majority making between 0-50,000 Ksh (60percent) in Kenya and 100 per cent in Rwanda as shown in Table 5.

Table 5: Differentials in Value of Output by Gender

Value of Output	Kenya		Rwanda	
	Male (%)	Female (%)	Male (%)	Female (%)
0-50,000	40.0	60.0	0	100
50,001-100,000	42.9	57.1	25.0	75.0
100,001-200,000	100	0	66.7	33.3
200,001-300,000	0	0	100	0
300,001-400,000	100	0	50.0	50.0
400,001-500,000	0	0	50.0	50.0
500,000+	0	0	100	0
	P-Value =0.195		P-Value =0.086	

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

Table 5 shows that gender differentials are more pronounced in Kenya than in Rwanda.

2.6 Cost of Gender gap

As mentioned earlier in the introduction and from the literature, it is important to determine how much these gender gaps cost in terms of productivity. The findings so far show that women own less land than men, that they do not have enough time to tend their land since they have to spread their time doing household chores before tending to their farms; that even the seeds that they use may not be of as high quality as those used by males; that they do not have access to finance which they can use to buy inputs for their farms; that they also do not have access to such inputs as fertilizers, farming tools, information and so on.

To determine the cost of the gender gap in Rwanda and Kenya a regression model was developed as illustrated below:

- ▶ Productivity = f (land, quality of seeds, finance, fertilizer, tools, information, time, others)
- ▶ Assume that Q = productivity, L = Land, S = seeds, C = finance, F = fertilizer, T = time
- ▶ E = equipment and tools, I = Information
- ▶ $Q = (L, S, C, F, T, E, I)$
- ▶ Agricultural productivity = Value of Output /per acre

$$Q = \beta_0 \text{Land} + \beta_1 \text{seeds} + \beta_2 \text{finance} + \beta_3 \text{fertilizer} + \beta_4 \text{Time} + \beta_5 \text{Equipment} + \beta_6 \text{information} + \xi$$

The variables considered in this study included marital status, literacy, land ownership, fertilizer use, hybrid seed use, pesticide use and access to irrigation, agricultural information and training, storage, processing of produce and processing facilities, markets, market information and finance and the results are presented in Tables 6, 7 and 8 .

Table 6: Combined Regression with Productivity as the Dependent Variable

Model	Un-standardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	Sig.
(Constant)	-96721.621	351047.709		-.276	.785
Gender (1 male, 0 female)	60038.312	126329.782	.116	.475	.640
Married	100178.114	201736.978	.119	.497	.625
Literacy	-92998.063	190803.155	-.139	-.487	.631
Land Ownership	-22362.288	128969.158	-.034	-.173	.864
Fertilizer Use	-250205.280	195569.846	-.439	-1.279	.215
Hybrid Seed Use	145959.394	179620.890	.219	.813	.426
Pesticide Use	87803.718	142426.002	.158	.616	.544
Access to Irrigation Facility	324911.549	127654.508	.553	2.545	.019
Access to Agric Information	70981.478	194458.653	.084	.365	.719
Training on Farming technique	23945.827	149231.406	.046	.160	.874
Access to storage & preservation facility	-8976.443	137559.181	-.014	-.065	.949
Processing Produce	-32435.115	122514.815	-.063	-.265	.794
Access to Processing Facility	4548.245	140205.542	.009	.032	.974
Access to Markets	-135252.106	349901.693	-.117	-.387	.703
Access to market info	110782.010	168173.392	.175	.659	.517
Access to Finance	39079.851	119337.774	.075	.327	.747

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

Table 6 presents results for both men and women combined; access to irrigation facility is the most significant variable with a P-Value of .012 and increases productivity by 324911.549 units meaning that access to an irrigation facility is a benefit to agricultural productivity. The other factors that influence productivity positively include marriage, hybrid seed use which adds 145959.394 units to productivity, pesticide use (87803.718 units), access to

agriculture information (70981.478 units), training (23945.827 units), access to processing facility (4548.245 units), access to market information (110782.010 units) and access to finance (39079.851 units). From Table 6, it is clear that being male is an added value to productivity.

However, illiteracy, lack of landownership, lack of fertilizer use, lack of access to storage and preservation facilities, lack of processing

produce and lack of access to markets are a cost to productivity. The most costly is non-use of fertilizer which attracts a cost of -250205.280 units. Illiteracy cost 92998.063 units, lack of land ownership costs 22362.288 units, lack of storage and preservation facility costs 8976.443 units, selling unprocessed produce cost 32435.115 and lack of access to

markets cost 135252.106 units. In total, for both men and women and considering the above inputs, the total costs would be 542229.3 units. Table 7 and 8 below present regression results for females and males respectively modelled separately.

Table 7: Regression model for Females only with Productivity as the Dependent Variable

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std Error	Beta	t	
(Constant)	50419.088	44632.530		1.130	.341
Married	23434.697	45756.733	.216	.512	.644
Literacy	-7919.797	40363.025	-.073	-.196	.857
Land Ownership	1392.387	16101.127	.016	.086	.937
Fertilizer Use	-3257.952	21078.601	-.041	-.155	.887
Hybrid Seed Use	-23508.987	18497.767	-.287	-1.271	.293
Pesticide Use	-8259.608	26417.001	-.104	-.313	.775
Access to Irrigation Facility	79139.107	33482.747	.817	2.364	.099
Access to Agric Information	-29624.494	27691.182	-.274	-1.070	.363
Training on Farming technique	41695.647	29534.661	.509	1.412	.253
Access to storage and preservation facility	-22292.024	14410.746	-.249	-1.547	.220
Processing Produce	16812.200	19110.081	.210	.880	.444
Access to Processing Facility	-10637.217	26887.031	-.135	-.396	.719
Access to Markets	-29215.738	43507.790	-.227	-.672	.550
Access to market info	46477.732	24357.889	.518	1.908	.152
Access to Finance	-18141.373	20402.150	-.229	-.889	.439

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

Marriage increases productivity for both men and women. Women who are married produce 23434.697 more as compared to those who are not. This could be because most women who are married have access to their husband's land. However, men who are married produce more compared to women and the value of their output increases by 516746.530 units, using Table 8 as a point of reference. This could be attributed to the fact that married men have cheap and unpaid labour in the form of their wives and children. According to qualitative data, most respondents said women and their children are a source of cheap and free labour, yet men

control the produce and the money from the sale of the produce and this could explain the reason why married men produce more than those who are not and also more than women who are married.

Illiteracy of women comes with a cost of -7919.789, while for the men it increases their productivity by 648474.156. This may be due to the fact that men are not the ones who actually do the farming but the women. In total, the cost of not having or using the above variables cost the women 152857 units in terms of productivity while the benefits of using the variables benefits them by 259370.9 units

Table 8: Regression model for Males only with Productivity as the Dependent Variable

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	Sig.
(Constant)	356146.734	922594.890		.386	.713
Married	516746.530	498335.720	.330	1.037	.340
Literacy	648474.156	609257.074	.755	1.064	.328
Land Ownership	-351326.083	613049.954	-.308	-.573	.587
Fertilizer Use	-1536125.637	883492.289	-1.600	-1.739	.133
Pesticide Use	412600.205	390546.415	.430	1.056	.331
Access to Irrigation Facility	569546.898	267776.875	.756	2.127	.078
Access to Agric Information	-172876.290	465632.103	-.110	-.371	.723
Training on Farming technique	59915.298	340896.859	.075	.176	.866
Access to storage and preservation facility	-1536125.637	883492.289	-1.600	-1.739	.133
Processing Produce	243979.752	313996.219	.348	.777	.467
Access to Processing Facility	-88849.017	343606.016	-.127	-.259	.805
Access to market info	-227207.342	345176.538	-.237	-.658	.535
Access to Finance	246554.926	363281.276	.348	.679	.523

Source: Field Survey in Makuyu in Murang'a Kenya and Musambara in Southern Province Rwanda 2014

Surprisingly, lack of land ownership increases productivity of women by 1392.387 units, while it is a huge cost to men by 351326.083 units, while lack of fertilizer use is a cost to both men and women. This implies that lack of land ownership affects men more than it does women since women have access to their husband's land even though they may not own it but men do not have such a privilege. All men interviewed during the survey reported that they used hybrid seeds, therefore, they were omitted in the regression analysis. On the other hand, not using hybrid seeds cost women 23508.987 units and this could be due to the fact that most women do not have access to funds to purchase these seeds. According to information from the institutional survey in Kenya, women do not have finances to purchase fertilizers, hybrid seeds and pesticides.

Access to irrigation facilities increased productivity in both cases by 79139.107 units for men and 569546.898 units for women and showed significance of about 10 per cent for

both cases. Access to agricultural information was a cost to both men and women costing 29624.494 units and 172876.290 units for women and men respectively. Access to training of Agricultural techniques caused an increase in productivity for both genders by 41695.647 units and 59915.298 units for women and men respectively. However, the difference was not as big as observed in other cases. Lack of access to storage and preservation facilities comes at a cost for both men and women, and it is more costly to men at 1536125.637 units as compared to 22292.024 for women.

Agricultural processing of food adds value, meaning that it increases the value of the product. According to Tables 7 and 8, processing of the farm produce increases the productivity of both men and women by 16812.200 units for women and 243979.752 units for men, with the men being the main beneficiaries as compared to women. However, lack of access to processing facilities is a cost to both men and women and

this could be due to the fact that most of the farmers do not own or control the use of these facilities as reported by many in both the qualitative and quantitative surveys.

Lack of access to markets cost women 29215.738 units. This could be due to the fact that men are the ones who control what and how much is to be sold according to the results from the qualitative surveys hence are more likely to look for and access markets as opposed to women who will sell their produce mainly within their localities at very low prices. However, all the men interviewed reported that they had access to the markets hence were excluded in the regression model. On the other hand, access to market information increases women's productivity by 46477.732 units but reduces that of men by 227207.342 units.

Access to finance is one of the main resources that most farmers in the FGDs said they would wish to access since, as the results in the Table 7 and Table 8 reveal lack of access to finance costs women 18141.373 units, while access to it increased the productivity of men by 246554.926 units. From the analysis of the qualitative data collected through FGDs, men were more likely to access finance as compared to the females, because most of the assets and payments made from cash crops are registered under men. For men the total cost for not using the above variables was 3912510 units while the benefits for using the same were 3053964.50 units.

2.7 Summary, Conclusion and Policy Recommendations

The objective of this study was to analyse the cost of the gender gap in agriculture in both

Kenya and Rwanda. Data were collected in Makuyu in Murang'a County in Kenya and in Musambira in the Southern Province of Rwanda. The data collected was quite small and this study is more of a pretesting rather than a full blown study which is expected to be done in 2015 and so these results should be interpreted with a lot of caution. From the descriptive statistics, it is clear that there are more and bigger gender gaps in Kenya than in Rwanda. From the analysis, it has emerged that the cost to women for not using the variables considered as necessary for agricultural production was only 152,857 units compared to men's cost of 3,912,510. In terms of benefits for using the above inputs, men benefit more than women as they get 3,053,964.50 compared to women's benefit of 259,370.90 units.

Only one variable, namely access to irrigation facility, showed any significance in influencing the cost of the gender gap and this could be due to the limited number of cases, which is confirmed when the data is split by gender, meaning that the cases reduce hence reduction in significance of the same variable when the regression is done for the genders separately. Moreover, the information received from the qualitative data supports most of the observations made in the quantitative interviews.

Although this study is based on a small sample, it still shows that gender gaps are costly to the farmers and to the economy in general. It is, therefore, important on the part of the governments of Kenya and Rwanda to put in measures to sensitize men to the fact that gender inequality is costly and by reducing it, both men and women benefit.

2.8 References

- Action Aid (2010), *Fertile Ground: How Governments and Donors can Halve Hunger by Supporting Small Farmers*, April 2010.
http://www.actionaid.org.uk/sites/default/files/publications/women_and_economic_transformation_post_2015_0.pdf
- African Women's Studies Centre and Kenya National Bureau of Statistics (2014a), *Status Report on Kenya National Food Security*, Nairobi; University of Nairobi Press,
- African Women's Studies Centre (2014b), *Women Experiences on Food Security; Filling the Granary*, Draft Report, University of Nairobi.
- Ariane, H. L. Hannah, H. Jeffrey and H. Heidi. (2010) *Separate and Not Equal? Gender Segregation in the Labour Market and the Gender Wage Gap*, Institute for Women's Policy Research, September 2010
- Bandara, A. (2012) *Economic Cost of Gender Gaps: Africa's Missing Growth Reserve*.
- Becker, G. S. (1995), "Social Consumption: The World of Veblen Revisited," *Mathematical Social Sciences*, Elsevier, vol. 30(3), pages 323-324, December.
- Currie, J. (1995), Gender Gaps in Benefits Coverage, in: *Handbook of Human Resources*, Greenwich CT: JAI Press, David Lewin, Daniel Mitchell, and Mahmood Zaidi (eds), Summer 1995, https://www.princeton.edu/~jcurrie/publications/Gender_Gaps.pdf
- Dollar, D. and Gatti, R. (1999), "Gender Inequality, Income and Growth: Are Good Times Good for Women?" World Bank Policy Research Paper on Gender and Development Working Paper Series, No 1.
- FAO (1993), *Agricultural Extension and Women Farm Workers in the 1980s*. Rome.
- FAO (1997) *Women: the Key to Food Security*. Rome.
- FAO (2005a), *Agricultural Censuses and Gender: Lessons Learned in Africa*. www.fao.org
- FAO (2005b), *Rural Women and Food Security in Asia and the Pacific: Prospects and Paradoxes* (<http://www.fao.org/docrep/008/af348e/af348e00.htm>).
- FAO (2006), *Improving Gender Equity in Access to Land 2006*. FAO Land Tenure Studies, FAO (www.fao.org/docrep/010/a0664e/a0664e00.htm).
- FAO (2008). *Rural Wage Employment in Developing Countries*. FAO. (<http://www.fao.org/>)
- FAO (2011), *The State of Food and Agriculture*, Food and Agriculture Organization of the United Nations, Rome, 2011.
- Gender Advisory Council (2014) Closing the Gender Gap: Challenges, Opportunities and the Future: A Transcript of PwC's film, www.pwc.com/women
<http://www.womensmedia.com/new/Lips-Hilarygender-wage-gap.shtml>
- Grey-Bowen, J. E. and D. A. McFarlane, (2010), "Gender Compensation Discrimination: An Exploration of Gender Compensation Gap and the Higher Education Connection", *Journal of Business Studies Quarterly*, 2010, Vol. 2, No. 1, pp. 65-82
- IFAD (1998), *Agricultural Implements used by Women Farmers in Africa*. IFAD. (<http://www.ifad.org/pub/other/ifadafr.pdf>)
- IMF (2010a), *World Economic Outlook* database <http://www.imf.org/external/pubs/ft/weo/2009/02/weodata/index.aspx>).
- IMF (2010b), *World Economic Outlook*, October 2010. Washington, DC.
- IMF (2010c) *World Economic Outlook*, April 2010. Washington, DC.
- Kanayo, N. (2011), Closing the Gender Gap in Rural Development, *International Trade Forum*; 2011; 3; ABI/INFORM Global, pg. 20, International Fund for Agricultural Development.
- Kiriti, T. and Tisdell, C. (2004), "Commercial Agriculture, Marital Status and other Influences on Food Availability: A Kenyan Case Study", *Journal of Food Agriculture and Environment*, Vol. 2, No. 3 & 4, pp. 140-147.
- Kiriti, T. (2003), Gender Inequality in Agricultural Households in Kenya: An Economic Analysis. Unpublished PhD thesis: University of Queensland: Brisbane Australia.

- Knowles, S. Lorgelly, P.K. and Owen, P.D. (2002), Are Educational Gender Gaps a Break on Economic Development? Some Cross-Country Empirical Evidence, *Oxford Economic Papers*, 54:118-149.
- Lips, H. M. (2008) The Gender Wage Gap: Debunking the Rationalizations.
- IFAD-ILO Workshop on Gaps, Trends and Current Research in Gender Dimensions of Agricultural and Rural Employment: Differentiated Pathways out of Poverty Rome, 31 March - 2 April 2009.
- Fontana, M. and Paciello, C. (2009), *Gender Dimensions of Rural and Agricultural Employment: Differentiated Pathways out of Poverty. A Global Perspective*, Paper presented at the FAO-
- Meinzen-Dick, R. Quisumbing, A. Behrman, J. Biermayr-Jenzano, P. Wilde, V. Noordeloos, M. Ragasa, C. Beintema, N. (2012) *Engendering Agricultural Research, Development, and Extension*, International Food Policy Research Institute
- Miles, C.A. (2006), Patriarchy or Gender Equality? Reading the Apostle Paul in Light of Ancient History and Modern Economics, *Dialogue*, June 2006.
- Mincer, J. (1974), "Education, Experience, and the Distribution of Earnings and Employment: An Overview", in *Education, Income, and Human Behaviour*, Edited by F. Thomas Juster, ed. pp. 71 - 94
- Monks, J., and K. McGoldrick. (2004), "Gender Earnings Differentials among College Administrators", *Industrial Relations*, Vol.43, No. 4, pp.742.
- Ngwira, N. and Mkandawire, E. (2003), Cost of Gender Disparities in Access to Socio-Economic Services in Malawi. IPAD, Blantyre
- OECD (2008) *Gender and Sustainable Development: Maximising the Economic, Social and Environmental Role of Women*, OECD.
- Quisumbing, A. R. (2003), *Household Decisions, Gender and Development*.IFPRI.
- Quisumbing, A. R. and S. McNiven, (2006), Migration and the Rural-Urban Continuum: Evidence from Bukidnon, Philippines. *Philippine Journal of Development*, Vol. XXXIII, (No. 1 and 2).
- Quisumbing, A. R. and L. Pandolfelli, (2008), *Promising Approaches to Address the Needs of Poor Female Farmers*.IFPRI Note 13.
- Quisumbing, A. R. and Y. Yohannes, (2004), *How Fair is Workfare? Gender, Public Works, and Employment in Rural Ethiopia (May 2004)*. World Bank Policy Research Working Paper No. 3492 (<http://ssrn.com/abstract=650201>).
- Quisumbing, A. R., J. P. Estudillo and K. Otsuka, (2003), Investment in Women and its Implications for Lifetime Incomes. In A. R. Quisumbing. *Household Decisions, Gender and Development*.IFPRI.
- Ruel, E. and R. M. Hauser, (2013), Explaining the Gender Wealth Gap, *Demography* (2013) Vol. 50: pp.1155–1176
- Saito, K. A., H. Mekonnen and D. Spurling. (1994), Raising Productivity of Women Farmers in sub-Saharan Africa, World Bank Discussion Paper 230: Washington, DC.
- UNIFEM (2005), *Progress of the World's Women (2005)*. UNIFEM
- World Bank (2006), *Gender Equality as Smart Economics*, World Bank.
- World Bank (2007a), *World Bank Development Report on Agriculture*, World Bank, Washington DC.
- World Bank (2007b) *Tanzania Gender and Assessment Report*. (http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2007/09/14/000310607_20070914155507/Rendared/PDF/408580TZ0Gender01PUBLIC1.pdf).
- World Bank, (2001), *Engender Development Through Gender Equality in Rights, Resources and Voice*, World Bank.
- World Bank (2008), *World Bank Development Report*. World Bank, Washington DC.
- World Bank, IFAD and FAO (2009), *Gender in Agriculture Sourcebook*. Washington D.C.: The World Bank
- World Economic Forum (WEF) (2007), *The Global Gender Gap Report (2007)*.

