

HOW GENDER PARITY CAN LEAD TO AGRICULTURAL BASED ECONOMIC GAINS IN MALAWI, TANZANIA AND UGANDA

Dr. Francis Onditi

Senior lecturer and Head

School of International Relations and Diplomacy

Riala University

Nairobi, Kenya

Abstract

In most countries in Africa, women farmers typically achieve lower productivity in agriculture than men, due to their limited access to –and returns from-- productive resources such as land. This results in an untapped productivity and potential for consolidating peace and stability on the continent. Thus, the dilemma remains, are women capable of engaging in meaningful agricultural activities that could in turn mitigate risks associated with complexities of livelihood related conflicts and absolute poverty? This article presents a methodology that has been used to measure the cost of gender gaps and advocate for redressing these multiple challenges in Malawi. The study established that in Malawi 24 per cent of arable land is controlled by women; even though women's plots are smaller than men's plots, the difference is only 0.05 hectares, pointing to the role of perception in land-related tensions. The data generated evidence in support of the fact that instituting agricultural policies that are more gender-specific and gender-targeted have the potential of not only closing the gender gap, but also ensuring that women are involved in mediation processes arising from land-related customary disputes.

Key words: Gender, Agricultural productivity, Malawi, Uganda, Tanzania

I. INTRODUCTION

Despite recent positive economic trends, many countries on the African continent face multiple and interlinked resilience and conflict challenges, forcing livelihoods to organize in a context of scarcity, scant resources and a high degree of uncertainty. Indeed, recent studies have shown that lack of gender perspective in agricultural policies may undermine efforts to support local resource management and climate adaptation (Yufang Su et al. 2017). At the same time, agriculture continues to be a main contributor to pro-poor growth and poverty reduction in African economies because it focuses on the parts of the economy in which the poor are active (Xinshen Diao et al. 2010). Majority of low-income development countries are '*agrarian*' economies, defined as countries in which 60 percent or more of the population live in rural areas (World Development Report 2013). Addressing gendered power relations in economic activities such as agriculture is prerequisite to not only challenge the stereotypical view that agriculture is reserved for men, but could also be a strategy for addressing one of the root causes of conflict, including a lack of food, hence preventing women-men tensions at a household level (Kelework Reda 2016).

The agricultural sector is however challenged from multiple fronts. Repeated shocks and chronic stresses challenge the positive trends further, and overwhelm existing coping mechanisms, triggering cycles of fragility which further deplete resources, upset livelihoods and, ultimately, may limit individual aspirations. The devastating effects of drought in the Horn of Africa, and the current drought which is unfolding, has seen most of the pastoral communities competing over scarce resources in Southern parts of Ethiopia, Northern Kenya, parts of Somalia and the Sudan. Indeed, drought and conflict have been shown to be linked (Reda 2016).

Limited market access and market variabilities – such as unpredictable staple food prices, coupled with public institutions that require strengthening –constrain the ability of especially poor, rural households to meet their needs. Markets are commonly controlled by few individuals (Mark Duffield 2001). Due to a series of interlinked deprivations and unequal starting points that have been robustly validated elsewhere,¹ rural women are especially vulnerable, even though they represent the majority of smallholder farmers. Women have less access to the range of access to resources as compared to men, and are mostly excluded to benefit from markets. Although shocks strike without discrimination, the resilience of women and girls is particularly tested as women are often in charge of balancing care work and productive engagement, whilst having access to limited resources and opportunities. Climatic stressors add to women's vulnerabilities. On this note studies from Southern African countries reveal that communities have adapted differently to complex livelihood related risks, including policy interventions that promote integrated approach to livelihood activities institutional reforms leading to conflict prevention (Elizabeth Francis 2002; Anneli Ekblom 212).

Women have an accentuated exposure to risks, multiple conflicts, and absolute poverty (Naomi Cahn, 2006) in all settings, ranging from full-blown conflict, in post-conflict states as well as in more stable democracies. According to Kelework Reda (2016), conflicts are mostly mediated by elderly leaders through traditional conflict resolution mechanisms on an ad hoc basis, and women's perspectives need to be further heard. Conflict, displacement, and natural disaster account globally

for three in five preventable maternal deaths² and are associated with substantive gender-based violence – as being subjected to rape, trafficking and prostitution, forced pregnancies and marriages are salient risks accentuated in resilience-challenged situations. Socio-economic inequalities are known to increase risks of violence (Elizabeth Porter 2013). Studies from Niger Delta, for example, indicate that both vertical and horizontal inequalities matter for the acceptance of violence, and that already deprived individuals are more likely to cause or support violence (Siri Rustad 2016).

This article is organized in four main sections. Introduction of the article contextualizes the study within the patriarchal society in Malawi, linking this to key concepts such as productivity, growth, gender and women empowerment. The article adopted the *Living Standard Measurement Study-Integrated Survey on Agriculture (LSMS-ISA)* using the *Third Integrated Household Survey (IHS3)* to analyze the social, economic and cultural cost of gender gap. Section II, delves into the literature on the linkages between livelihoods, vulnerabilities and shocks emerging from diverse sources such as livelihood-related conflicts. Section III, presents the results and discussion highlighting factors facilitating close of gender gap or barriers to women’s access to agricultural productive assets and implications of gender inequalities not only to the agricultural sector, but also other aspects of life such as peaceful co-existence. The article concludes by pointing to the need to design agricultural policies that are more gender-specific as well as gender-targeted as a means to ensuring resilient and stable societies.

II. METHODOLOGY

In this study, a simple method is developed to quantify the benefits from closing the gender gap in agriculture for the economy as a whole. The benefits are expressed as higher total agricultural production, higher total GDP, and lower poverty levels, and this, in turn can be taken to contribute to enhanced conditions for peaceful development. Although countries such as Malawi, is generally regarded as fairly stable, emergence of regionalized and disruptive threats in recent years have threatened to tilt stability (International Monetary Fund, IMF 2015). In view of the multiple challenges facing women, comprehensive measurement techniques were utilized. Decomposition methods are used to identify the factors which explain the gender gap. This article utilizes the *Living Standard Measurement Study-Integrated Survey on Agriculture (LSMS-ISA)* using the *Third Integrated Household Survey (IHS3)* collected between March 2010 and March 2011 in Malawi. Data sets are nationally-representative and contain gender-disaggregated data at the plot level. The Malawi questionnaire allows only one person to be listed as a decision maker.

This study uses the terms ‘agricultural productivity’ and ‘crop productivity’ interchangeably, although crop production is only one component of total agricultural production³. Agricultural productivity is represented by the gross value of output per hectare. For each crop grown on the plot, we take the self-reported harvested quantity (in kilograms) and multiply it by the median crop sale price per kilogram for the crop in the respective enumeration area (or higher geographic areas if village-level unit sale prices are not available). The values of all crops on the plot are then

summed up and the sum is divided by the plot size (in hectares), to arrive at the gross value of output per hectare on that plot.

Productivity between female and male-managed plots is then compared, rather than between farms. We take the mean difference in the values of output per hectare between male and female-managed plots to constitute the unconditional (gross) gender agricultural productivity gap. Using the Oaxaca-Blinder (O-B) decomposition method (Alan Blinder 1973; Ronald Oaxaca 1973) (discussed below) we explain the part of the gap that is associated with differences in the quantities of inputs and that which is associated with differences in the returns to inputs. One caveat is that, while the calculation of the unconditional gender gap at the center of the O-B decomposition is not complicated, it does not take into account that on average women control smaller plots than men. Because farmers may be more productive on smaller plots than they are on larger plots, there could be a possibility that women farmers may record similar gross value of output per hectare as male farmers, because they cultivate smaller plots (Calogero Carletto et al. 2011). As a complement, we therefore also present and discuss an alternative measure of the unconditional (raw) gender gap that is conditional on plot area (and geographic characteristics⁴) which we refer to as the ‘naïve’ gender gap.

III. THE GENDER GAP IN AGRICULTURAL PRODUCTION

The existence of a gender gap in agricultural productivity suggests that factors of production could be more efficiently allocated across farmers and potential optimum output is hence not achieved. Depending on size of the productivity gap and the fraction of land under the control of women, the costs in terms of foregone agricultural production can be extensive. But these costs are not restricted to the agriculture sector because of the extensive linkages between the agricultural sector and the rest of the economy (Samuel Benin et al. 2008). Indeed, crops are not only for domestic consumption or for export, many of them are inputs in the processing manufacturing such as grain processing, animal feed processing, beverages, textile and clothing, fuels, furniture and other processing industries. At the same time, agriculture utilizes inputs such as fertilizer and pesticide and marketing services from the non-agricultural sectors. Growth in the agricultural sector will therefore spring growth in other sectors.

To estimate the costs of the gender gap in terms of forgone agricultural output and total GDP we follow the approach proposed in FAO (2011)⁵, where we obtain the total harvest in the country, Q , by multiplying the productivity per hectare, Y , by the total arable land, A ^{6,7}, from the World Development Indicators database (WDI) (World Bank 2014; World Bank 2013) as shown in 1):

$$\text{Equation 1: } Q = Y * A$$

We express the mean productivity on female plots, Y_f , in terms of the mean productivity on male plots, Y_m , using the estimate of the gender gap, G :

Equation 2: $Y_f = G * Y_m$

If the gender gap is 20 percent, then $G = 0.80$. Total harvest value obtained from men's and women's plots is, therefore:

Equation 3: $Q = Y_f PA + Y_m (1 - P)A$

where P is the fraction of land under the control of women, estimated by multiplying the fraction of all plots under the control of female managers by the average area of female plots and dividing it by the average plot size from the pooled sample of male and female plots as shown below:

Equation 4: $P = \frac{\text{number female plots} * \text{average area of female plots}}{\text{number of all plots} * \text{average area of all plots}}$

Substituting equation 2) into equation 3) gives the total harvest value, Q , in the presence of a gender gap in productivity – we term this scenario the ‘baseline scenario’. We can also obtain the potential harvest value, Q^* , under the hypothetical scenario of no gender gap in agricultural productivity where $Y_f = Y_m$. The additional crop output from closing the gender gap in productivity as a fraction of the total baseline crop harvest is $\Delta = (Q^* - Q)/Q$.

In many developing countries crop harvest is the largest component of agricultural GDP⁸ and this figure is about 83 percent in Malawi (World Bank 2015). Closing the gender gap in crop production will hence increase agricultural GDP by the crop share equivalent amount⁹. As mentioned, growth in the agricultural sector will stimulate growth in other sectors through its linkages with the rest of the economy which may be extensive especially if agriculture is well-diversified and does not rely heavily on a few export crops. This said, GDP is therefore expected to grow by more than the agricultural GDP share-equivalent growth.

Economy-wide models for various countries estimate the multiplier effects that run between agriculture and the rest of the economy.¹⁰ For Malawi, Benin et al. (2008) estimate a multiplier of 1.11 suggesting that each dollar generated in the agricultural sector generates \$0.11 in additional benefits in the non-agricultural sectors. The strength of the agricultural multipliers depends on the structure of the economy as economies with a greater share of non-tradable agricultural goods -- perhaps the result of poor market development-- are likely to experience higher local economy effects and therefore higher multipliers, while economies with high share of tradable agricultural outputs --especially if agricultural outputs are traded in their raw form-- are likely to experience smaller multiplier effects as the benefits will be largely captured by the producers and the benefits to consumers will be shared at the international level (Xavier Irz et al. 2001).

Agricultural growth not only spurs growth in other sectors but it does so with a strongly pro-poor bias (Diao et al. 2010). Indeed, Paul Dorosh and James Thurlow (2014), provide estimates of poverty-growth elasticities for five countries in Africa and for these, they suggest that growth led

by the agricultural sector will bring twice as many people out of poverty compared to similar growth led by the non-agricultural sector¹¹.

IV. RESULTS AND DISCUSSION

As earlier mentioned in this article, agricultural GDP represents a sizable share of total GDP, employs majority of the working-age population, and has extensive linkages with the rest of the economy. This section presents findings in two main categories: 1) gender gap in agricultural productivity; b) productivity gap and poverty; and c) constrained access to production facilities.

a. The Gender Gap in Agricultural Productivity and Growth

Estimating, and subsequently closing, the gender gap in agricultural productivity is a step towards not only reducing structural inequalities, but, it could prepare path-way for empowering women and communities to sustain security, enhance resilience to conflict situations, and provide vital livelihood options in peace building. It will be critical that agricultural productivity is maximized to as to provide effective livelihood options, enhance food security, and reduce vulnerabilities.

The difference in plot size between male and female managers is small in Malawi --less than 0.05 hectares-- and therefore the naïve estimate of the gap is only marginally higher than the unconditional gap (31 percent versus 28 percent) (See Table 1). Women farmers also control fewer plots - about 26 percent of all plots in Malawi. Taking into account the fraction of plots under the control of female managers and their average sizes, we estimate that women control about 24 percent of arable land in Malawi. Fear of losing land in Malawi substantively holds back productivity in Malawi, as documented by Deininger et al (2017), alluding to female farmers specifically balancing potential conflict.

Table 1: Naive estimate of gender gap in agricultural productivity in Malawi

Dependent variable: Log gross harvest value per hectare(MK)						
	1)	2)	3)	4)	5)	6)
Female decision maker	-0.284*** (0.025)	- (0.025)	-0.284*** (0.025)	-0.258*** (0.024)	-0.271*** (0.025)	0.312** (0.025)
FE	No	Region	Agro-ecological zone	District	Region	Agro-ecological zone
Plot size	No	No	No	No	Yes	Yes
Number of observations	16,192	16,192	16,192	16,192	16,192	16,192
R2	0.013	0.029	0.014	0.074	0.081	0.058

Note: ***p<0.01, **p<0.05, *p<0.1 .Estimates weighted in accordance with the survey design

Source: Field data (March 2010 and March 2011 in Malawi)

Household livelihood arrangement (particularly access to productive land) is an important means of risk buffering in local economy in Malawi. Fialho Feliciano (1989) has shown the importance

of domestic sharing as coping mechanisms against livelihood related shocks. Anneli Ekblom (2012) study in Southern Mozambique illustrate how this kinship alliances network around livelihoods build resilient societies. This institutionalization of livelihood coping mechanisms in local economy have been likened to formation of ‘social capital’ (Ian Scoons 1998). Social capital building is an important aspects of conflict preventive diplomacy as highlighted by peacebuilding analysts (Steven Zyck and Robert Muggah 2012; Elizabeth Eldredge 1995)-this include collective activities aimed at preventing conflicts and development assistance intended to uncover the root causes of conflict by improving the quality of governance, social and economic conditions, as well as promoting attributes of gender equality in all spheres of life.

b. The Productivity Gap and Poverty

Numerous studies show that agriculture-led growth has strong effects on poverty reduction and that generally agriculture-led-growth is more effective at reducing poverty than non-agriculture led-growth (Xinshen Diao et al. 2010). There is also evidence that within the agricultural sector, growth led by food crops, grown on most smallholder farms, is more poverty-reducing than growth led, by export crops, which are more likely grown by wealthier farmers and on large-scale farms (Diao et al. 2012). Because female farmers are among the poorest and most resource constrained, improving productivity on women’s plots will inevitably improve their welfare and will help them, and their families, come out of poverty.

In addition, we argued above that the benefits from closing the gender gap will likely spill to other sectors and therefore lead to broad-based poverty reduction. Indeed, women’s empowerment not only reduces deprivation, but also increases women’s ability to make strategic choices about distribution of such resources, and this may significantly shift power relations (Catherine Dolan and Linda Scott 2009), and, hence, possibly enhancing a sustained and conflict-resilient development.

In Malawi, one percent increase in GDP reduces poverty rate by 1.19 percent in Malawi (See Table 2). One percent growth led by the non-agricultural sector is anticipated to reduce poverty by 0.61 percent in Malawi.

Table 2: Benefits in terms of lower poverty from closing the gender in agricultural productivity

	Malawi	Tanzania	Uganda
<i>Poverty rates</i>			
%population<\$1.25 per day*	72.16%	43.48%	37.91%
Estimated number of people<\$1.25 per day (in 2010)	10,833,882	19,554,404	13,324,631
<i>Poverty-growth elasticities*</i>			
Poverty-growth elasticity(\$1.25):Agriculture	-1.19	-0.89	-2.15
Poverty-growth elasticity(\$1.25): Non-Agriculture	-0.61	-0.33	-1.04
<i>Percent change in poverty rates</i>			
%Poverty reduction (\$1.25):Agriculture-led	2.20%	0.41%	0.90%

%Poverty reduction (\$1.25):Non-Agriculture-led	1.13%	0.15%	0.43%
#people OUT of poverty (\$1.25):Agriculture-led	238,362	79,723	119,287
#people OUT of poverty (\$1.25):Non-Agriculture-led	122,185	29,560	57,702

Source: Field data (March 2010 and March 2011 in Malawi)

Given a poverty-growth elasticity (PGE) of -1.19 for Malawi (See Table 2), the 1.85 percent growth generated from closing the gender gap in crop production implies that poverty will reduce by 2.2 percent, bringing almost a quarter million people out of poverty in the same year, whereas a similar growth rate generated from the non-agricultural sector would lift only half as many people out of poverty. The poverty reduction may be even higher if we take into account that policies to close the gender gap will directly benefit women. Given that women are more likely to spend on additional income on household consumption and goods and children's welfare, therefore household food security and nutrition is also likely to improve, generating additional household benefits.

c. Factors contributing to constrained access to production facilities

Moreover, results show that women's access to resources is constrained, using limited inputs and access to modern technologies including improved seeds and irrigation technologies and finance, and this holds back agricultural productivity. In Malawi, women and men farmers make different use of male family labor by women and men farmers, farm different crops, women are disadvantaged in accessing agricultural machinery and production technologies. Although marginal factors such as access to pesticide (0.97 percent), inorganic fertilizer (5.32 per cent) and education (8.20 per cent) contribute to women's ineffective production, topping the list of factors contributing to gender gaps include, men domination (45.19 per cent) and lack of access to high value crops (28.43 per cent) (See Table 3).

Table 3: Factors that contribute to gender gap in Malawi ,Tanzania and Uganda

	Malawi		Tanzania		Uganda	
	Fraction of gap	In terms of GDP (2010 USD)	Fraction of gap	In terms of GDP (2010 USD)	Fraction of gap	In terms of GDP (2010 USD)
Quantity of male family labor per HA	45.19%	\$45,110,180	97.34%	\$102,180,543	-	-
High valued crops	28.43%	\$28,378,296	3.00%	\$3,153,441	13.29%	\$8,872,253
Agricultural implements	17.76%	\$17,722,900	8.18%	\$8,591,710	9.02%	\$6,021,846
Pesticide use	0.97%	\$964,601	12.03%	\$12,630,384	4.45%	\$2,973,106
Inorganic fertilizer	5.32%	\$5,313,775	6.39%	\$6,707,789	3.04%	\$2,026,367
Education	8.20%	\$8,181,246	-1.74%	\$-1,828,052	12.86%	\$8,586,135

Factors that are statistically significant at the five percent level are in bold. In each country for high valued crops is defined slightly differently: in Uganda we use a dummy variable equal to one if a cash crop is grown on the plot; in Malawi we use the fraction of plot under export crops (tobacco); Tanzania we use the fraction of plot under cash crops.

Source: Field data (March 2010 and March 2011 in Malawi)

In addition, women are less engaged in the production of cash crops as compared to men, who dominate in the more profitable segments of commercial agriculture. This confers with findings by others (Cheryl Doss 2002; Dolan 2001) suggesting women even lose control of “their” crops if and when these become commercial as men then take over. Hence, women’s opportunities to work and trade out of poverty are also limited. This may be due to labor or cash shortages, or because women seldom own land and have weak land tenure rights, they may be less motivated to make the hefty investments that are often, especially in cash crop cultivation (Markus Goldstein and Christopher Udry 2008; Morrison et al. 2007).

V. WHAT DOES IT MEAN TO ‘CLOSE’ THE GENDER GAP?

The benefits from redressing gender inequality in agricultural production will result in crop output which is 7.3 percent higher if the (unconditional) gender gap is closed and 8.1 percent higher if the naïve gender gap is closed (i.e., if women achieve the same productivity as men on same-sized plots) (See Table 4). These numbers are interpreted against a scenario of persisting gender inequality in productivity. Coupled with the fact that crop production constitutes about 83 percent of agricultural GDP in Malawi, the 7.3 percent higher crop production translates into 6.06 percent higher agricultural GDP compared to the case with no change in the gender gap¹². Because the naïve gender gap for Malawi is only marginally higher, the respective benefits from closing the naïve gender gap are only slightly larger and in terms of agricultural GDP they translate to an increase of 6.7 percent. In a similar study it was established that, for every one Malawian Kwacha (MK) increase in agricultural GDP, total GDP will increase by MK 1.11 (Benin et al. 2008)¹³. Therefore, if agricultural GDP increases by 6.06 percent (USD 89.9 million in 2010 prices), total GDP will increase by 1.85 percent (or USD 99.8 million).

Further analysis shows that economy-wide benefits on GDP of closing the gender gap in Malawi are higher (1.85 per cent) compared to Tanzania (0.46 per cent) and Uganda (0.42 percent) (See Table 4):

Table 4: Economy-wide benefits from closing the gender gap in agricultural productivity

	Malawi	Tanzania	Uganda
Percent change in total GDP	1.85%	0.46%	0.42%
Percent change in Agricultural GDP	6.06%	1.46%	1.64%
Percent change in crop harvest value	7.30%	2.09%	2.80%
Estimated gain in (current 2010 USD)*	\$99,813,239.27	\$104,970,747.16	\$66,751,606.18

Source: Field data (March 2010 and March 2011 in Malawi)

It will be important for policies to take an inclusive view, in which women participate meaningfully in policymaking and resource allocation; benefit substantially from public and private sources of capital for agricultural production; and partner collaboratively with men in constructing recovery, the new peace and prosperity. Empowered women can contribute significantly to stabilization agenda, and agriculture will be an important strategy in effective resilience responses on the Continent. Empowered women need ‘to re-imagine resilience and security in their own terms’ (Hilly Hamber et al. 2006:491), in ways that enhance their agency/force for positive change. There is need for culturally adaptive interpretations of the role security plays in facilitating women’s empowerment, especially from an African perspective.

VI. CONCLUSION

The study reveal that at the household level, it has to be observed, that increased incomes, especially emanating from the women could be a major source of conflict within the home as men sometimes look at the power imbalances and not at the benefit to the entire household. The household approach propagated by UN Women and partners, has helped in ensuring that couples plan their economic ventures together, including the use of any income flows thereof. This has greatly reduced misunderstandings between couples leading to reduced conflicts in homes. Despite convincing evidence that women do not obtain the same value of output per unit of land as men because they cannot access the same amount and type of productive resources, and wide recognition of the benefits of eliminating the gender gaps, there has been little progress in improving women farmers’ situation. One challenge is lack of gender-disaggregated data, which is one currency of communication between local development efforts and diplomacy. Data is typically patchy and often out-of-date, and gender-disaggregated national data has been in limited supply.

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