

What are the Factors Driving the Gender Gap in Agricultural Productivity in Tanzania?

Final Report

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Executive summary

In 2015 the UN Women Regional Office for Eastern and Southern Africa, the UN Development Programme - UN Environment Programme Poverty-Environment Initiative Africa, and the World Bank undertook a joint investigation, the final report of which was called 'The Cost of the Gender Gap in Agricultural Productivity in Tanzania, Malawi and Uganda'. Defining agricultural productivity as the monetary value of output per unit of land, the Report used the 2010/2011 Tanzania National Panel Survey to estimate that, conditionally accounting for gender-based differences in the quality and quantity of land, the gender gap in agricultural productivity in Tanzania was 30 per cent. The costs of the gap equated to 3.9 per cent of current crop production, 2.7 per cent of agricultural GDP, or 0.86 per cent of total GDP. It was estimated that eliminating the gap would lift 80,000 people out of poverty a year over a ten-year period. Using a decomposition analysis the Report found that the inability of women plot operators to acquire adequate amounts of male family labour generated 97.3 per cent of the gender gap in agricultural productivity. Closing this gender gap had the potential to raise GDP by more than US\$102 million. It found that women plot operators used lower levels of pesticides and inorganic fertilizer, and closing this gap had the potential to increase GDP by over \$19.3 million. Finally, it found that women plot operators' access to agricultural implements was significantly lower than that of men, explaining 8 per cent of the gender gap in agricultural productivity. All results were statistically significant.

However, surveys of living standards like Tanzania's National Panel Survey can only generate answers to the questions that are asked, and if important questions are not asked the veracity of the results may be more limited. Therefore, this study presents the findings of an in-depth qualitative analysis of the factors driving the gender gap in agricultural productivity, as identified by women and men members of farming communities in rural Tanzania. It also examines the extent to which gender gaps in agricultural productivity impact upon the capacity of women and men plot operators to adopt climate-smart agricultural practices. Four districts were the site of field research: Ngorongoro in Arusha region; Bunda in Mara region; Ikungi in Singida region; and Kigoma in Kibondo region. In total, 19 villages were visited, encompassing 8768 farming households. Some 547 people were members of focus group discussions, and 195 women were members of the women's-only discussions.

This study confirms the presence of a gender gap in agricultural productivity in rural Tanzania. It confirms that women are unable to obtain adequate quantities of male family labour to work on their plots, but that also women's ability to work on their plots is constrained by the social expectations that women perform significant quantities of unpaid care and domestic work and that women contribute unpaid labour on their husband's plots while not controlling the output of that work. Together, these lead to a reduced ability of women plot operators to allocate adequate amounts of time to work on the plots of land that they control. At the same time, women are expected to provide the cash necessary to meet household maintenance needs, and when cash is short this requires engaging in off-farm casual waged labour or petty trading, both of which further reduce the amount of time that women have to work on the plots of land that they control. It also means that women do not have the cash needed to buy the pesticides, fertilizers and implements that contribute to the gender gap in agricultural productivity. Cumulatively, women witness time poverty, and because labour is a key agricultural input this serves to reduce production and productivity. It also reduces the amount of labour available for seasonal and time-consuming climate-smart agricultural techniques, and may indeed contribute to the adoption of unsustainable agricultural practices and increase vulnerability to climatic variation. Together, these may further lower agricultural productivity, household food security and nutrition. Finally, this study finds that in many cases the constraints on women's productivity is sustained by the use of gender-based violence, which also has economic consequences for the productivity of women's

plots.

Therefore, the study makes policy recommendations that are designed to confront the gender stereotypes that continue to undermine policy-making, address women's time poverty and lack of incomes, as well as facilitate the adoption of gender-responsive climate-smart agricultural practices.

These policies include:

- identifying male champions of gender equality that can demonstrate the improvements to livelihoods that can come about when husbands and wives cooperate;
- facilitating the development of women's self-help groups, to collectively advocate for improved access to the assets and incomes need to increase productivity;
- introducing and scaling-up a Government project in rainwater harvesting;
- developing and scaling-up a Government project in solar stoves;
- rolling out the Productive Social Safety Net programme;
- expanding and financing training in gender-responsive climate-smart agricultural extension services;
- scaling-up the Government's Mkurabita project to provide certificates of customary rights of occupancy over the use of land, titled in the name of both wife and husband;
- developing a small-scale project to rapidly identify the most promising agricultural value chains in Tanzania where women feature prominently;
- undertaking revisions to Tanzania's key statistical instruments in order to enhance their gender-responsiveness; and
- undertaking further microeconomic quantitative research into the gender gap in agricultural productivity in Tanzania.

I. Framing the study of the gender gap in agricultural productivity in Tanzania

1. Introduction: the objectives of the study

i. Estimating the cost of the gender gap in agricultural productivity in Tanzania

In Tanzania, as elsewhere in the eastern and southern African region, women and men farmers do not always face the same production conditions, nor do they always make the same production choices. They consequently may not have identical levels of agricultural productivity. In 2015 the UN Women Regional Office for Eastern and Southern Africa, the UN Development Programme - UN Environment Programme Poverty-Environment Initiative Africa, and the World Bank undertook a joint investigation, the final report of which was called 'The Cost of the Gender Gap in Agricultural Productivity in Tanzania, Malawi and Uganda'.¹ The 2015 Report provided quantitative evidence of the links between agricultural productivity, economic growth and gender inequalities, estimating the costs, in terms of lost growth opportunities, of gender inequalities in agriculture in the three countries. What makes the 2015 Report stand out is that it produced a monetary value of the gender gap in agricultural productivity, and in so doing provided an easy-to-grasp means by which to stress the importance of addressing gender gaps in agricultural productivity. A unique aspect of the 2015 Report was that it sought to control for differences in the plot sizes and the agro-ecological conditions that are faced by women and men farmers, which can be important drivers of productivity differences even in the presence of non-gender-biased access to other factors of production.

For Tanzania, the 2015 Report found that the unconditional gender gap in agricultural productivity, which did not account for gender-based differences in the quantity and quality of land, was estimated to be 16 percent. The costs of this unconditional gender gap equated to:

- 2.1 per cent of current crop output; or
- 1.5 per cent of agricultural gross domestic product (GDP) (or over US\$85 million); or
- 0.46 per cent of total GDP (or US\$105 million), including the multiplier effects of the benefits of increased agricultural productivity flowing to other sectors of the economy.²

The conditional gender gap in agricultural productivity, which did account for gender-based differences in the quality and quantity of land, was estimated to be 30 per cent. The costs of the gap equated to:

- 3.9 per cent of current crop production, or
- 2.7 per cent of agricultural GDP (or about US\$105 million); or
- 0.86 per cent of total GDP (or about US\$196 million).³

1 Available: <http://www.unwomen.org/en/digital-library/publications/2015/10/the-cost-of-agricultural-productivity> (accessed 26 January 2017). Henceforth, this document will be referred to in this study as the 2015 Report.

2 A multiplier of 1.11 is used, as the benefits of raising agricultural production also include spillovers to other sectors in the economy. It is also assumed that closing the gender gap influences all agricultural sectors equally in Tanzania.

3 Spillover effects and economywide linkages are taken into account in estimating this GDP benefit.

Combining the gross gains in GDP with the poverty-growth elasticities reported in 2014 by Dorosh and Thurlow,⁴ it was estimated that the potential poverty reduction benefits of closing the unconditional gender gap equated to a 0.42 per cent reduction in headcount poverty in Tanzania, or approximately 80,000 people being lifted out of poverty a year over a ten-year period.

The Oaxaca-Blinder decomposition approach⁵ was then used to determine how much of the gender gap arose from the different levels of agricultural inputs used by women and men and how much was a consequence of women obtaining lower returns from using these inputs. This was also estimated in terms of potential gross gains in GDP.⁶ Several determinants were examined, based on data availability, including manager characteristics, household demographics, household wealth, plot characteristics, crop choice, the use of fertilizer, farming techniques, and labour inputs.

The first finding from the decomposition analysis was that women farmers were less able to access adequate amounts of male family labour to work on their plots, which effected the total amount of labour used in farming. Overall, the inability to acquire adequate amounts of male family labour generated 97.3 per cent of the gender gap in agricultural productivity in Tanzania. Closing this gender gap in the cultivation of high-value crops had the potential to raise GDP by more than US\$102 million. The second finding from the decomposition analysis was that women used lower levels of advanced agricultural technologies, notably pesticides and inorganic fertilizer. Lower use of pesticides and inorganic fertilizer by women was equivalent to potential gross gains in GDP of over \$19.3 million. Finally, women's access to agricultural implements was significantly lower than that of men, explaining 8 per cent of the gender gap in agricultural productivity. Bringing lesser use of pesticides and inorganic fertilizer along with poor quality tools and implements together, it can be said that there were gender-based differences in the choice of production technique adopted by women and men plot operators.

The statistically significant results of the estimate of the gender gap in agricultural productivity in Tanzania are important, but require further investigation. This is because Tanzania's National Panel Survey, which was used to produce the quantitative results, despite being statistically representative, has limitations. In particular, in common with other panel surveys of living standards, household-level consumption and expenditure data omits the intra-household distribution of consumption and expenditure. At the same time, panel surveys that combine the investigation of living standards with agricultural activities, like the National Panel Survey, may not fully account for all of the activities undertaken throughout the working day by women and men. In both instances, panel surveys can only generate answers to the questions that are asked, and if important questions are not asked the veracity of the results may be more limited.

ii. This study

The objective of this study is to present the findings of an in-depth qualitative analysis of the factors driving the gender gap in agricultural productivity in Tanzania that builds upon the findings and recommendations of the 2015 Report. To that end, this study presents findings derived from primary and secondary data. Primary data has been collected through stakeholder consultations and interviews

4 Available: <http://www.sciencedirect.com/science/article/pii/S0305750X1300226X> (accessed on 4 October 2017).

5 Available: http://econ.sites.olt.ubc.ca/files/2013/05/pdf_paper_nicole-fortin-decomposition-methods.pdf (accessed on 4 October 2017).

6 This analysis builds on earlier work by Kilic, Palacios-Lopez, and Goldstein (2015), Slavchevska (2015), and Ali et al. (2015). Similar analysis is carried out for Ethiopia, Niger, and Nigeria by Aguilar et al. (2015), Backiny-Yetna and McGee (2015), and Oseni et al. (2015), respectively.

at the community and household level in order to get a better understanding of factors driving the gender gap in agricultural productivity in order to:

- a) explore additional factors that may explain the gender gap in agricultural productivity that were not highlighted in 2015 Report. The emphasis in this study is to identify, describe and explain the socio-economic, institutional and policy constraints that influence the gender gap in agricultural productivity identified in the 2015 Report;
- b) validate the specific factors identified as driving the gender gap in agricultural productivity in order to gain a better understanding of how they might be addressed in policy and programming;
- c) build upon the field work and existing research to develop a deeper understanding of women's and men's vulnerability to climatic variations and environmental degradation, and how this links to gender gaps in the agriculture sector;
- d) explore impacts of gender gaps in agriculture and how these might influence unsustainable agricultural practices, environmental degradation and poverty;
- e) further contextualize and where necessary amend the policy solutions highlighted in the 2015 Report as well as identifying additional policy solutions to close any gender gaps in agricultural productivity, and in particular any gender gaps in CSA practices;
- f) provide recommendations on the most effective high-impact solutions to close any gender gaps in agricultural productivity, and in particular any gender gaps in CSA practices.

2. Gender challenges in Tanzania's agricultural economy

i. Agricultural performance

Tanzania is undergoing rapid change. Between 2012 and 2016 GDP grew at an average rate of 6.6 per cent per year,⁷ and per capita income rose from US\$870 per person to US\$932. At the same time, the share of non-agriculture in total production has risen over time, to stand at almost 68 per cent for the period between 2010 and 2014, as industry witnessed rates of growth that far exceeded those of services or agriculture.⁸ The sub-sectoral drivers of growth have been construction, finance, mining and telecommunications.⁹ Nonetheless, rain-fed agriculture continues to be a key contributor to real GDP growth, food prices dominate inflation, agricultural input subsidies are an important part of government spending, agriculture provides 65 per cent of industrial inputs, and coffee, cotton, cashew nuts, tea, sisal, tobacco and, more recently, horticultural products, are key exports.^{10,11} For these reasons, Tanzania remains a primarily agricultural economy.

Out of the 44 million hectares of land in Tanzania that is classified as arable only 27 per cent is under cultivation and less than one per cent of that is irrigated.¹² Moreover, much of the arable land in Tanzania is subject to soil degradation, driven by unsustainable and changing land use practices, which reduces agricultural productivity, which is in turn additionally challenged by environmental hazards, and in particular climatic variability. Indeed, women farmers are often more vulnerable to climate

7 <http://documents.worldbank.org/curated/en/340591491579331322/pdf/114125-NWP-P156957-PUBLIC-add-series-9th-TEU-April-7-2017-reduced.pdf> (accessed on 27 June 2017).

8 https://www.ifad.org/documents/30600024/30604583/RDR_WEB.pdf/c734d0c4-fbb1-4507-9b4b-6c432c6f38c3 (accessed on 27 June 2017).

9 http://www.mof.go.tz/mofdocs/msemaji/Five%202016_17_2020_21.pdf (accessed on 28 June 2017).

10 <http://documents.worldbank.org/curated/en/340591491579331322/pdf/114125-NWP-P156957-PUBLIC-add-series-9th-TEU-April-7-2017-reduced.pdf> (accessed on 27 June 2017).

11 http://www.mof.go.tz/mofdocs/msemaji/Five%202016_17_2020_21.pdf (accessed on 28 June 2017).

12

http://www.tzdp.org.tz/fileadmin/documents/external/national_development_frameworks/ASDP2_Final_Document_20_May_2016_af ter_edit_1_.pdf (accessed on 28 June 2017).

change because of their socially-constructed historic disadvantages, which will be discussed in detail below, and which has generated limited access to resources and limited control over decision-making.¹³ At the same time, the unsustainable and inefficient use of even the limited chemical fertilizers and pesticides that are applied can cause pollution.¹⁴ The agricultural sector can play an important role in climate change adaptation and mitigation, but environmentally sustainable and climate-smart approaches to farming are not yet mainstream in Tanzania.

ii. Agriculture, livelihoods and poverty in rural Tanzania

The importance of agriculture in general, and farming and crop production in particular, is especially the case for Tanzania's people and their livelihoods. Agriculture employs 77 per cent of all those who are working,¹⁵ and the bulk of employment is in self-employment or as own-account and contributing family labour on small-scale subsistence-oriented farms, indicating the importance of the farm economy in supporting rural livelihoods. At the same time, however, 80 per cent of agricultural labour in Tanzania is provided by women.¹⁶ Moreover, this is an underestimate of the importance of women to the rural Tanzanian economy. The 2014 Integrated Labour Force Survey indicates that women spend 432 minutes a day on total work, of which 238 minutes are in unpaid care and domestic work. Conversely, men spend a total of 408 minutes a day in total work, of which 64 minutes are in unpaid care and domestic work.¹⁷ As a consequence of the distribution of time between unpaid care and domestic work and the productive work that is captured in the system of national accounts, women spend more time working than men in rural Tanzania. It is a pattern that is established in childhood and which acts as a major constraint on labour availability for farming, fishing and agro-pastoralism in rural Tanzania.¹⁸ Thus, the rural economy of Tanzania should be seen as a gendered structure.

Given the sectoral distribution of employment, it is not surprising that poverty in Tanzania remains a predominantly rural phenomena, with the rural poor being overrepresented among the share of the population that falls below both the Basic Needs Poverty Line of TSH36,482 and the Food Poverty Line of TSH26,085.¹⁹ Moreover, with a 2010 fertility rate of 5.4 and a population growth rate of 2.9 per cent, poverty reduction in general and rural poverty reduction in particular remains a significant challenge.²⁰ Rural poverty is experienced through nutritional and food insecurities that are largely witnessed in chronic malnutrition as well as micronutrient deficiencies, which are gendered.²¹ While male-headed households are more likely to be poor than female-headed households, because of the sheer number of male-headed households, the depth of the poverty experienced by female-headed households is greater than that experienced by male-headed households and female-headed households have higher dependency ratios than male-headed households.²² The implication is that the impact of climate change, which is effecting the performance of agriculture,²³ is experienced to a greater extent by women, in that they are responsible for a disproportionate share of the rural poor and have a greater

13 http://www.mcdgc.go.tz/data/CCA_guidelines.pdf (Accessed in November 2017).

14 <http://ageconsearch.umn.edu/bitstream/6441/2/469143.pdf> (accessed on 9 August 2017).

15 <https://www.usaid.gov/sites/default/files/documents/1860/CDCS%20Tanzania%20FINAL.pdf> (accessed on 27 June 2017).

16 <https://www.usaid.gov/sites/default/files/documents/1860/CDCS%20Tanzania%20FINAL.pdf> (accessed on 27 June 2017).

17 <http://www.nbs.go.tz/nbstz/index.php/english/statistics-by-subject/labour-statistics/614-the-2014-integrated-labour-force-survey-ilfs> (accessed on 4 July 2017).

18 <http://wildaftanzania.org/wp-content/uploads/2016/08/TANZANIA-WOMENS-RIGHT-SITUATION-2015-Print-Ready-1.pdf> (accessed on 25 November 2017).

19 <http://documents.worldbank.org/curated/en/340591491579331322/pdf/114125-NWP-P156957-PUBLIC-add-series-9th-TEU-April-7-2017-reduced.pdf> (accessed on 27 June 2017).

20 <https://www.usaid.gov/sites/default/files/documents/1860/CDCS%20Tanzania%20FINAL.pdf> (accessed on 27 June 2017).

21 <https://www.usaid.gov/sites/default/files/documents/1860/CDCS%20Tanzania%20FINAL.pdf> (accessed on 27 June 2017).

22 <http://www.fao.org/3/a-i4083e.pdf> (accessed on 27 June 2017).

23 <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-6188> (accessed on 28 June 2017).

role in total rural work.

iii. Gender, assets, inputs and expenditures

Gendered rural poverty in Tanzania affects and is affected by other dimensions of gender inequality. Women's access to resources differs from that of men; while smallholder farms have an average size range of between 0.9 and 3.0 hectares, 73 per cent of landholders are men and only 27 per cent of landholders are women.²⁴ Moreover, women's farms are smaller, have fewer plots, are less likely to be irrigated, and use less hired labour than farms managed by a man.^{25, 26} Where farmers do use improved seeds, there is a gender gap, in that men are more likely than women to use improved seeds.²⁷ Women farmers are particularly affected by the inadequate number of agricultural extension service officers and their under-resourcing, which results in a lack of quality technical advice at the village and household level. Moreover, agricultural extension service officers are predominantly men and often do not recognize the unique and specific constraints facing women plot operators.²⁸ While there are no gender differences between the extent of market-orientation in farming, which in any event only applies to 3.5 per cent of farms,²⁹ when women have access to an earned income from wages or off-farm self-employment it is likely to be lower than that earned by a man; women are more likely than men to be employed as casual farm labour but are paid three times less than men for such work.³⁰ There is some evidence that women are more likely than men to spend earned income on their family's needs, whether it be in terms of food provisioning, meeting health expenses, or paying out-of-pocket household expenses.³¹

The Tanzania Agriculture Development Bank (TADB) was established to improve farmers' access to finance by providing loans at low interest rates in order to guarantee food security and contribute to the transition from subsistence farming to commercial farming.³² The TADB offers loans to small-scale farmers through the Private Agricultural Sector Support Trust.³³ However, few women can access loans from it, or other financial institutions, as they lack the formal property rights that are necessary as collateral.

iv. Gender and climate change

As a result of the gender-differentiated farm activities documented above women and men have distinct engagements with the environment, natural resources and climate change.³⁴ Moreover, it should not be assumed that women and men share the same knowledge and experience of the natural environment, resources and their management; indeed, gender-differentiated farm activities would suggest that women and men have different experience and knowledge of the natural environment. As a result,

24 <http://www.fao.org/3/a-i4083e.pdf> (accessed on 27 June 2017).

25 <http://www.fao.org/3/a-i4083e.pdf> (accessed on 27 June 2017).

26 <http://dhsprogram.com/pubs/pdf/FR321/FR321.pdf> (accessed on 4 July 2017).

27 <http://www.fao.org/3/a-i4083e.pdf> (accessed on 27 June 2017).

28 <http://tgnp.org/wp-content/uploads/2017/09/Annual-Report-2016.pdf> (accessed on 25 November 2017).

29

http://www.tzdp.org.or.tz/fileadmin/documents/external/national_development_frameworks/ASDP2_Final_Document_20_May_2016_ater_edit_1_.pdf (accessed on 28 June 2017).

30 <http://www.fao.org/3/a-i4083e.pdf> (accessed on 27 June 2017).

31 <http://www.iiste.org/Journals/index.php/DCS/article/view/5079> (accessed on 27 June 2017).

32 <http://documents.worldbank.org/curated/en/274631468312904648/pdf/E46350V10AFR0E0Box385313B00PUBLIC0.pdf> (accessed on 25 November 2017).

33 The Private Agricultural Sector Support Trust is a nonprofit non-governmental organization established in 2000 to stimulate investment and growth in commercial agriculture and agribusiness by providing financial and business development services to small and medium agricultural entrepreneurs.

34 Available: <http://www.futureclimateafrica.org/wp-content/uploads/2017/04/gender-agriculture-climate-services-brief-umfula-final.pdf> (accessed on 6 October 2017).

ongoing processes of climate change are likely to impact differently on men and women farmers, who then may adopt differential coping and adaptation strategies in response.

As a consequence of differences in the knowledge, ownership and control of resources, in particular land, men are more likely to be able to adapt to risks emerging from climate variability, and its associated natural disasters, than women. Women manage more fragile lands; their plots are thus more likely to be affected by floods, landslides and the resulting soil degradation and erosion; and because of their limited incomes, they can even less than men afford the fertilizers that might partially compensate for soil degradation.

In terms of coping and adaptation strategies, these too can be gendered. Due to unequal bargaining power within households, men are more likely to influence the coping and adaptation strategies adopted within male-headed households. Thus, as a result of frequent and prolonged dry periods arising from climate change, farms may increasingly move away from growing traditional cash crops such as tobacco and toward more reliable, drought resistant, early maturing food crops that can be sold for cash such as cassava, beans, and improved varieties of maize. However, this can potentially contribute to food insecurity as the cash from these “flexible”³⁵ crops grown for sale are not used to purchase food needs because the control over the disposal of the crop passes from the hands of women to the hands of men when food crops are grown to be sold, reinforcing gendered disadvantage. At the same time, as a consequence of climate change men may have to go further away to look for pasture for their livestock, while women may have to walk longer distances for water and firewood, limiting their time for agricultural and food production.

v. Gender and social norms in Tanzania

Women's ability to participate in their communities is often mediated by men. This means that the terms and conditions by which women participate in farm production may be mediated by men, which has the potential to impact upon agricultural productivity. Tanzania has long-standing commitments under international and regional human rights instruments, and has made impressive improvements in gender equity in primary school enrollment³⁶ and women's representation in Parliament.³⁷ Nonetheless, 42 per cent of women in Tanzania experience intimate partner violence during their life; 30 per cent have experienced it within the last 12 months.³⁸ Tanzania has a high incidence of early marriage, as a result of which there is a high rate of early pregnancy and a lower rate of secondary school completion. Reproductive health services do not adequately target young women, and 60 per cent of those living with HIV/AIDS are female. Finally, women comprise only 10 per cent of the political leadership at the district level or below. Cumulatively, and notwithstanding positive changes, women's lesser status is evidenced by Tanzania's ranking in both the Social Institutions and Gender Index of the Organization of Economic Cooperation and Development and the Gender Inequality Index of the United Nations Development Programme (UNDP).^{39, 40}

vii. The institutional and policy setting

Mainland Tanzania offers a relatively enabling environment for promoting gender equality and women's rights in the agricultural sector, and in a way that is consistent with the aspirations of the

35 “Flexible” crops are those that can be used for food or can be sold.

36 http://www.unesco.org/eri/cp/factsheets_ed/TZ_EDFactSheet.pdf (accessed on 30 March 2018).

37 https://www.iri.org/sites/default/files/wysiwyg/tanzania_gender_report.pdf (accessed on 30 March 2018).

38 <http://evaw-global-database.unwomen.org/en/countries/africa/ united-republic-of-tanzania?> (accessed on 27 June 2017).

39 <https://www.usaid.gov/sites/default/files/documents/1860/CDCS%20Tanzania%20FINAL.pdf> (accessed on 27 June 2017).

40 <http://dhsprogram.com/pubs/pdf/FR321/FR321.pdf> (accessed on 4 July 2017).

Sustainable Development Goals (SDGs), most notably SDG 2 on promoting sustainable agriculture and SDG 5 on achieving gender equality, to which both Tanzania is formally committed. The Constitution of the United Republic of Tanzania of 1977⁴¹ contains article 9, which is the juridical foundation of gender equality in Tanzania, identifying people as being equal and free individuals enjoying freedom, justice, fraternity and concord, and stipulating that the state authority and all its agencies are obliged to direct their policies and programmes toward ensuring this outcome. The Tanzanian Government has committed to the realization of gender equality through its ratification of a series of key international conventions and policy instruments on gender. In addition, the Government has enacted a series of laws which provide the legal basis by which women's equality can be improved.

Vision 2025 is the overarching national policy framework within Tanzania, and all policies, programmes and projects should be consistent with it.⁴² Vision 2025 seeks to provide the basis by which Tanzania transitions from a least developed country to a middle income country by the year 2025, and is wholly consistent with Tanzania's commitment to meeting the SDGs by 2030. The aspirations of Vision 2025 are anchored in Tanzania's Long Term Perspective Plan (LTPP), 2011/2012-2025/2026, which was developed and adopted to ground planning efforts to meet the transformational objectives of Vision 2025.⁴³ The implementation of the LTPP is sequenced into three five-year development plans (FYDPs), the most recent of which is FYDP II of 2016/17 – 2020/21. FYDP II is built on three pillars: that of transformation, of industrialization, and of implementation effectiveness.⁴⁴ According to FYDP II, a key reason why FYDP I failed to meet its target economic growth rate was the weak implementation of the plan's strategic objectives in agriculture. In this regard, it should be noted that while gender is mainstreamed throughout much of the general objectives of FYDP II, and while it is stipulated that “yields per hectare in agriculture are still lower on land worked primarily by women compared with that on land worked by men”⁴⁵ gender is weakly integrated into the objectives of the FYDP II with regard to agriculture.

The Women and Gender Development Policy of 2000 provides the guidelines to integrate gender equality into policies, plans and development strategies and actions in all sectors and at all levels of government in Tanzania,⁴⁶ and led to the establishment of gender focal points in central and local government structures. The National Strategy for Gender and Development of 2005 sought to consolidate and speed up the implementation of the Women and Gender Development Policy and in so doing create the preconditions that can redress gender gaps and inequalities between men and women.⁴⁷ The National Strategy is notable for identifying women's lesser levels of education, as well as their “traditional” and reproductive roles as being important factors which affect the productivity and development of women. Finally, the 2016 National Plan of Action to End Violence against Women and Children in Tanzania (2017/18 – 2021/22) seeks to eliminate violence against women and children in Tanzania and in so doing improve their welfare.⁴⁸

Tanzania has ratified a number of international instruments that impact upon the agricultural sector, and notably its gender dimensions. Amendments to the Constitution in 1998 ensured that every person has

41 Available: <http://www.parliament.go.tz/publication/journals> (accessed on 7 October 2017).

42 Available: <http://www.tzonline.org/pdf/theTanzaniadevelopmentvision.pdf> (accessed on 7 October 2017).

43 Available: http://www.tzdpd.or.tz/fileadmin/documents/dpg_internal/dpg_main/DPG_Main_2012/LTPP_2012-03-19_PRINT.pdf (accessed on 7 October 2017).

44 Available: http://www.mof.go.tz/mofdocs/msemaji/Five%202016_17_2020_21.pdf (accessed on 7 October 2017).

45 Available: http://www.mof.go.tz/mofdocs/msemaji/Five%202016_17_2020_21.pdf (accessed on 7 October 2017), page 19.

46 Government of the United Republic of Tanzania. Women and Gender Development Policy (2000). This document is not available online, but can be obtained from the UNDP Country Office.

47 Available: <http://www.mcdgc.go.tz/data/Tanzania - National Strategy for Gender Development.pdf> (accessed on 11 October 2017).

48 Available: http://www.mcdgc.go.tz/data/NPA_VAWC.pdf (accessed on 11 October 2017).

the right to own property and the right to have their property legally protected. The 1995 Land Policy reaffirmed that all land in Tanzania is public land vested in the President as a trustee on behalf of the country's citizens and noted that women have the same rights to land as men. In light of the 1995 Land Policy the Land Act and the Village Land Act were both passed in 1999 to govern land on the mainland.

The National Agriculture Policy (NAP) of 2013 currently guides the regulatory framework in the agricultural sector.⁴⁹ The policy is explicitly predicated on the fact that the majority of Tanzanian farmers are women; that women constitute the majority of the agricultural labour force; and that more than 90.4 per cent of active women in Tanzania are engaged in agriculture. To that end, the gender objectives of the NAP 2013 are to facilitate the equitable participation of men and women in the production of goods and services in agriculture while ensuring that the benefits derived from participation in agricultural activities are equitably shared. Within the framework of the NAP 2013, the Agricultural Sector Development Programme Phase II (ASDP II) was finalized in 2016.⁵⁰ The goal of ASDP II is to contribute to economic growth, reduced rural poverty and improved food security and nutrition in Tanzania. Gender is mainstreamed across the ASDP II as a crosscutting issue. However, among the 23 priority investment areas ASDP II identifies only one investment that is directly related to gender and/or women, namely improving the benefits of women and youth along various dimensions of the agricultural commodity value chain. The 2015 – 2025 Tanzania Climate Smart Agricultural Programme (TCSAP) seeks to sustainably increase agricultural productivity through the adoption of climate-resilient agricultural practices. The introduction of climate-smart agricultural practices is to be predicated on the adoption of a gender lens in order to better ensure the resilience of the food and agricultural system. However, as a relatively new programme, the TCSAP has yet to be operationalized.

Tanzania's legal and policy landscape for the agricultural sector has progressively incorporated a gender dimension, albeit with varying levels of responsiveness. The challenge is that there has been an inadequate implementation of laws and policies that uphold and protect women's rights and gender equality. At the same time, it remains the case that there is inadequate sex- and gender-disaggregated data that would facilitate a better understanding of women's issues and processes of gender inequality in Tanzania, provide the foundation for the development of evidence-based policies, programmes and projects, as well as underpin a rigorous monitoring and evaluation framework capable of demonstrating the results that are necessary to argue the case for the inclusion of gender-responsive planning, budgeting and implementation. Thus, national institutional and policy commitments to gender equality in Tanzania more generally or in the agricultural sector more specifically have not yet effectively translated into either gender-inclusive policies, programmes and projects, women's empowerment, or the introduction of gender-responsive CSA practices. Nonetheless, it remains the case that the ASDP II and the TCSAP provide critical strategic entry points for ensuring that agricultural policies and development investment plans, at both national and local government level, are more responsive to the different needs of women and men and that adequate resources are allocated to ensure implementation.

3. Conclusion: understanding gender and agricultural productivity in Tanzania

It is apparent that the rural economy of Tanzania should be approached as a gendered structure, and that

49 Available: http://www.fao-ilo.org/fileadmin/user_upload/fao_ilo/pdf/ICA_MLW_and_TZ/NATIONAL_AGRICULTURAL_POLICY-2013.pdf (accessed on 7 October 2017).

50 Available: http://www.tzdp.gov.or.tz/fileadmin/documents/external/national_development_frameworks/ASDP2_Final_Document_20_May_2016_after_ed_it_1_.pdf (accessed on 7 October 2017).

the Government recognizes this. The gendered character of Tanzania's rural economy has important implications for economic growth and poverty reduction. The World Bank noted in its 2015 mainland poverty assessment that “poverty has become more responsive to growth”, and that for every 10 per cent increase in growth per person, poverty can be expected to be reduced by 10.2 per cent.⁵¹ Economic growth is, in turn, driven by productivity improvements.⁵² In this light, while it was encouraging that value added per worker in agriculture, as a measure of agricultural productivity, increased by 33 per cent in constant terms between 1998 and 2009, it is far less encouraging that value added per worker in agriculture has remained essentially static since 2010, indicating less capacity for gender-responsive pro-poor growth in rural Tanzania.⁵³ Limited improvements in productivity may, in turn, by restricting general improvements in livelihoods, foster environmental and natural resource degradation; people may feel compelled to overexploit their environmental resources, further perpetuating disappointing productivity in farming, which can in turn impact upon other rural sub-sectors such as forests and fisheries.

In rural economics agricultural productivity reflects a unique relationship between farm inputs and farm outputs, and is most commonly expressed as output per unit of a single input.⁵⁴ The two most widely used measures in rural economics are land productivity, defined as output per unit of land; and labour productivity, defined as output per unit of labour effort. In either instance, output may be defined in either physical quantities or as a monetary value. It can be defined in terms of crop productivity, farm productivity, or the productivity of all agricultural activities, including forestry and fishing, being undertaken by the rural producing unit. Labour inputs are often defined in terms of hours of time, but can also be defined in terms of a monetary value.

As a gendered structure it cannot be assumed that the benefits of increased agricultural productivity, economic growth and poverty reduction are equitably shared between women and men. Nor should not be assumed that improvements in agricultural productivity are the same for female farmers and male farmers. Indeed, this recognition was an important reason why the 2015 Report was undertaken. However, it has been noted that quantitative studies can only produce results for the questions that are asked. This has a very important implication: if the sources of agricultural productivity improvements in Tanzania are gender-differentiated, and yet evidence is not available for all of the possible drivers of gender-differentiated agricultural productivity, this will have a direct impact upon understanding – and misunderstanding – economic growth and poverty reduction. This recognition serves as the basis for the qualitative investigation of the drivers of gender-differentiated agricultural productivity that is the objective of this study.

51 <http://documents.worldbank.org/curated/en/679851467999966244/pdf/AUS6819-WP-v1-P148501-PUBLIC-Tanzania-summary-15Apr15-Box391437B.pdf> (accessed on 27 June 2017).

52 <https://www.forbes.com/sites/billconerly/2015/05/19/productivity-and-economic-growth/#48b5410b5417> (accessed on 27 June 2017).

53 <http://data.worldbank.org/indicator/EA.PRD.AGRI.KD?locations=TZ> (accessed on 27 June 2017).

54 <http://gsars.org/wp-content/uploads/2017/02/TR-17.02.2017-Productivity-and-Efficiency-Measurement-in-Agriculture.pdf> (accessed on 30 March 2018).

II. Analytical framework

When gender gaps in agricultural productivity are present, as was demonstrated in the 2015 Report, the conventional way of investigating them is to analyze how men and women managers of plots of land access and apply different components of farm productivity. These include: i) factors of production, which consist of land, labour, seeds, fertilizers, pesticides, herbicides, tools and equipment; ii) orthodox agronomic practices; iii) climate change and environmental mitigation measures; and iv) CSA adaptation techniques on their plots of land. Agricultural productivity is a function of the efficiency and effectiveness of the application of these factors of production, which are in turn a result of the agronomic practices being followed, which impact upon soil fertility, and which serve as the foundation of the effective adoption of CSA practices.

The gender-responsive economic analysis that underpins this study does not challenge this conventional analytical approach, but it does offer a deeper insight into the underlying drivers of agricultural productivity and its sources. Clearly, land productivity output is in part a function of labour input. Thus, labour inputs play a key role in the measurement of both land and labour agricultural productivity. However, in order for labour to be available to work on the land, people must be fed, they must be clothed, they must be healthy, and they must have the requisite knowledge and skills needed for the work that they are doing. In other words, the well-being of individuals within households depends upon people being able and prepared to participate in the economy. This in turn begs a question: how is it that people are prepared for their participation in work, on a day-to-day basis? They are prepared through forms of work that take place prior to their entry into economic production. This work encompasses the preparation of food, child care, the maintenance of clothing, the reinforcement of shelter, the provision of hygiene and sanitation, and other activities, all of which must be performed before labour is available for work on the farm or in the factory. In this sense, then, the capacity to work in economic production and be productive is itself an output of a previous work, and the terms and conditions by which this previous work takes place will shape the capacity to work and be productive. Yet very few investigations into agricultural productivity examine the role of this previous work and its potential impact on agricultural productivity.

In order to understand why this is not done, it is necessary to understand what is meant by “work”. In the United Nations System of National Accounts, first established in 1953, “work” is defined as anything that an individual could theoretically pay another individual to do for them. This definition of work is then used to establish what “counts” as economic production and what does not count as economic production, as well as what counts as employment. There is, however, one exception to this definition of work. Labour services performed by household members for the consumption of other household members are not counted as work even though they could theoretically be compensated. As a consequence, these labour services are not considered as economic production or employment even though they do produce an output – the capacity to work in economic production – and they do require time and energy by those providing the labour services in order for them to take place.

These activities are called in the UN system unpaid care and domestic work. “Unpaid” means that the person doing the activity is not compensated in cash or in-kind and that the work is not counted in gross domestic product or employment estimates. “Care” means that the activity serves people and

their well-being; it includes both personal care and care-related activities, such as cooking, cleaning, washing clothes, household healthcare and informal household education. “Domestic” means that this work takes place within the household. “Work” means that the activity entails expenditures of time and energy on the part of the people undertaking the activity. Unpaid care and domestic work is a critical, if largely unseen, bio-physically and socially necessary activity needed to prepare people to participate in economic production, and in so doing contribute to the well-being of a household, of other households, and of the community, in that if unpaid care and domestic work is not performed people are less able to go out to work in economic production, less able to go to school, and less likely to be healthy. Moreover, in that an important part of unpaid care and domestic work is the raising of children to assume their household, community and social responsibilities, unpaid care and domestic work builds human and social capital by fostering the trust and integrity necessary for societies to operate.

The Organization for Economic Cooperation and Development has found that in all countries for which there is evidence women do far more unpaid care and domestic work than men.⁵⁵ This is because of deep-seated inequalities in power relations within households between women and men, with men in many societies able to exercise effective if at times implicit control over women, including the distribution of work as well as the control of any resources, including incomes and assets, that are generated from that work. Inequalities in how time is used, the quantity and quality of assets that are available, and how incomes are used have the potential to effect agricultural productivity. These inequalities reflect social norms and values that perpetuate unequal decision-making authority within households. However, these social norms and values are far too commonly enforced through the use of gender-based violence, which itself is a disturbing manifestation of the structural imbalances of power and agency that are present between women and men. Moreover, when gender-based violence is used to perpetuate social norms and values that generate inequalities in time use, assets and incomes it has economic ramifications. The economic costs of gender-based violence, while recognized within the UN system,⁵⁶ are only starting to be quantified.⁵⁷ So structural imbalances of power and agency have negative social, political and economic consequences for women and men and girls and boys, and preclude women and girls from realizing their fundamental human rights. Therefore, the realization of SDG 5, achieve gender equality and empower all women and girls, requires the realization of SDG Target 5.4, on recognizing, reducing and redistributing unpaid care and domestic work, as a precondition of achieving women's empowerment more generally and women's economic empowerment more specifically.

In this light, in the analysis that follows gender gaps in agricultural productivity are understood in the following way. Social norms and values, including the use of **gender-based violence**, result in an intra-household distribution of **unpaid care and domestic work**. The distribution of unpaid care and domestic work effects the terms and conditions by which men and women enter into and are able to work on the plots of land that they operate and the amount of time that they are able to allocate to working on the land. This is because it structures the **quantity and quality of labour** available to work on the plots of land that they operate. In particular, the need to perform unpaid care and domestic work can significantly contribute to **time poverty** for those that are expected to undertake it, with time poverty being defined as working long hours in a combination of unpaid care and domestic work and economic production so that the elasticity of leisure with respect to total work is zero. Moreover, social

55 https://www.oecd.org/dev/development-gender/Unpaid_care_work.pdf (accessed on 10 December 2017).

56 <http://www.unwomen.org/en/news/stories/2016/9/speech-by-lakshmi-puri-on-economic-costs-of-violence-against-women> (accessed on 2 April 2018).

57 <http://www.unwomen.org/en/digital-library/publications/2013/2/estimating-the-cost-of-domestic-violence-against-women-in-viet-nam> (accessed on 2 April 2018); <https://www.giz.de/en/downloads/giz2014-0252en-costs-violence-women-ecuador.pdf> (accessed on 2 April 2018).

norms and values that generate asymmetrical power relations between men and women result in gender-based differences in access to, control of, and **use of cash incomes**, which can have an effect on gender-based differences in the use of **non-land non-labour farm inputs**. Cumulatively, the result is **gender gaps in agricultural productivity** as well as **gender gaps in agricultural incomes**, which only serve to reinforce asymmetrical power relations between men and women.

Thus, the gender-responsive economic analysis that underpins this study argues that economic production and productivity is a function of the performance of unpaid care and domestic work, which is itself allocated between women and men on the basis of social norms and values enforced by gender-based violence. The utility of this approach is that it not only traces the linkages between unpaid care and domestic work and productivity, but that it also allows an understanding of how the performance of unpaid care and domestic work directly impacts upon growth in the agricultural economy and beyond.

In order to understand how the performance of unpaid care and domestic work directly impacts upon agricultural growth, it is necessary to recognize that in economic terms, unpaid care and domestic work has an opportunity cost: work in economic production is foregone when an individual is undertaking unpaid care and domestic work. This means, in turn, that the available labour supply is reduced and that incomes are lower when unpaid care and domestic work is performed. This has implications for agricultural productivity, in that less labour is available to work on plots of land when unpaid care and domestic work has to be undertaken, while the lower incomes that arise from having to perform unpaid care and domestic work means that there is less cash available to spend on the maintenance of the household, let alone productivity-enhancing non-land non-labour on-farm inputs such as improved seeds, fertilizer, pesticides and herbicides, and CSA techniques and technologies.

In that it has an opportunity cost, unpaid care and domestic work impacts upon agricultural growth. In the short run, the principal source of growth is demand: expenditure on goods and services, which requires disposable income. However, if people have to perform unpaid care and domestic work their ability to take part in economic production is diminished, as a result of which their **incomes** are lower, which means that they are less able to spend on goods and services, thereby reducing demand. As a consequence, growth is reduced. In the long run, the principal source of growth is supply, which in turn is a function of the quantity and quality of the labour force along with the technologies available to the labour force with which they can work. However, if people have to perform unpaid care and domestic work their ability to supply their capacity to work in economic production is reduced, as a result of which the quantity of **the labour force is reduced**. Moreover, lower incomes that arise from the need to perform unpaid care and domestic work means that less money is available to invest in **human capital formation**, reducing the quality and skills of the workforce. Cumulatively, labour supply is diminished, with negative consequences for growth. Therefore, a gender-responsive economic analysis suggests that there is a household maintenance constraint that limits the capacity of the members of a household to undertake economic production, which has a direct impact on agricultural productivity, and which has important implications for gender equality and women's economic empowerment.

III. Methodology

i. Research methods

This study digs deeper into the findings and recommendations of the 2015 Report. The 2015 Report was a quantitative analysis of the statistically-representative National Panel Survey. Its goal was to seek to deductively explain the generalizable proximate causes of the monetary cost of the gender gap in agricultural productivity in Tanzania. This study is primarily based upon the use of qualitative methodology. Primary data was collected through stakeholder consultations and interviews at the community and household level in order to get a better understanding from respondents of factors driving the quantitative gender gap in agricultural productivity. The qualitative data was complemented by a desk review of available policy documents and research literature, in order to situate the observations with the broader policy environment of Tanzania.

The 2015 Report produced three key econometric results of the drivers of the monetary gender gap in agricultural productivity in Tanzania, summarized in Section I.1.i. For the in-country field work the three results were used as null hypotheses to organize the qualitative research, in light of data collected from desk studies, in order to triangulate the veracity of the findings. The qualitative field work was designed to go beyond the proximate determinants of the gender gap in agricultural productivity, in order to unpack any deeper on-the-ground trends and patterns that might be observed in the data to impact upon any gender gap that was observed. At the same time, the qualitative field work expanded upon the earlier analysis by also focusing on how CSA practices might impact upon the gender gap in agricultural productivity, which could not be estimated in the 2015 Report. Specifically, the qualitative field work allowed an investigation of how gender-responsive alterations in access to and usage of factors of production, along with the adoption of CSA, might impact upon gender gaps in farm crop productivity, improve household livelihoods, and enhance environmental sustainability.

A multi-staged sampling technique was used. The qualitative field work locations were randomly and purposefully selected to represent the agro-ecological zones⁵⁸ of Tanzania and also to reflect districts where the impact of climate change has been recently noted. The locations included: the Central zone – Ikungi district in Singida region; the Lake zone – Bunda district in Mara region; the Western zone – Kibondo district in Kigoma region; and the Northern zone – Ngorongoro district in Manyara region. The field work for this study took place between July and September 2017. Although it has not been attempted to ascertain the extent to which the four districts may be statistically representative of Tanzania as a whole, certain factors in the four districts that are discussed later in the study render them “typical” of rural Tanzania. In each district between four and six villages were visited during the field work, making a total of 19 village visits, encompassing 8768 farming households. The study could not cover all of Tanzania's agro-ecological zones because of resource limitations.

Qualitative data collection and the testing of null hypotheses derived from the quantitative analysis was done through participatory methodologies designed to further explain the socio-economic, institutional and policy constraints that impact upon local populations and thus the local drivers of any gender gap in farm plot productivity. The key participatory methodologies used were semi-structured focus group discussions (FGDs) and key informant interviews (KII). Through FGDs and KII, and guided by checklists developed for the specific purpose of understanding gender gaps in agricultural productivity, particular attention was paid as to whether there was any gender-differentiated access to and quantities of key factors of production: land, labour, seeds, fertilizers, water, tools and equipment, and the awareness and use of CSA agronomic techniques. The FGDs and KIIs also allowed the identification of the impact of climatic variations and environmental degradation on agricultural productivity, and in particular the extent to which there may have been gendered impacts, along with the key drivers of those gendered impacts. In many instances activity clocks were developed to supplement the participatory methods.

The FGDs involved groups of both female and male plot managers, as well as young, middle-aged and elderly farmers; women-only farmers groups; and groups of individuals representing specific groups of farmers, such as various types of cooperative societies. In total, 547 people took part in FGDs. Following each FGD women farmers were asked to remain and answer an additional set of inquiries, in order to confirm the validity of the information that had been received in the wider FGD and to expand upon some of the issues raised in the FGDs. In total, 195 women took part in women-only discussions. Particular attention was paid in the women-only discussions as to whether there was any gender-differentiated access to and quantities of key factors of production: land, labour, seeds, fertilizers, water, tools and equipment. Where gender-differentiated access to and quantities of key factors of production were identified, the drivers of these gender differences was explored, as well as their relative magnitude. At the same time, the women-only discussions identified whether decision-making over crop disposal was gendered, and the extent to which flows of income into households were shared among senior household members. Finally, the women-only discussions explored the extent and effect of unpaid care and domestic work and the prevalence of and impacts caused by gender-based violence.

Stakeholder consultations were conducted to review the findings of the 2015 Report, review the null hypotheses guiding the qualitative field work, and preview the preliminary findings of the qualitative field work, in order to evaluate the extent to which stakeholders believed the qualitative research had uncovered gendered binding constraints on agricultural productivity on the ground. Stakeholders included national planners and policymakers, UN system organizations, donor agencies and development partners, research and academic institutions, and national and international civil society organizations. In particular, consultations included: Tanzania's Ministry of Agriculture, Livestock and Fisheries; the Ministry of Finance and Planning; the Ministry of Health, Community Development, Gender, Elderly and Children; the Food and Agriculture Organization of the UN; the Economic and Social Research Foundation; Policy Research for Development; the Tanzania Gender Networking Programme; the United States Agency for International Development; Mwananchi PPL; TATODA; and Makambaku Municipal Council.

IV. Findings from the field

1. Demographic and gender characteristics of the districts

Ngorongoro is subdivided into 3 divisions and 14 wards; 60 per cent of the district consists of the Ngorongoro Conservation Area. Ngorongoro had an estimated population of 196,000 in 2016.⁵⁹ Some 80 per cent of the population of the district are pastoralist Masai. The district council indicates that there are low levels of education, and some 70 per cent of population is illiterate. District planners note that gender disparities are witnessed in female genital mutilation, early marriages, early pregnancies, and persistent gender-based violence. More generally, the region ranks first in the country's regional human development index but ranks fifth in the regional gender development index.⁶⁰ According to the 2015 – 2016 Demographic and Health Survey, in the region 32 per cent of women have no say over major household decisions, 69 per cent of women think that wife-beating is acceptable, 34 per cent of women have been subjected to physical violence and 10 per cent of women have been subjected to sexual violence, and 41 per cent of women have undergone female genital mutilation (FGM).⁶¹ In this light, it appears not surprising that the district council sees “inadequate economic empowerment”⁶² among women, and a lack of programming at the district level has contributed to the persistence of this situation.

Bunda is divided into 3 divisions, 79 villages and 388 hamlets. In 2014 the population of the district was 335,061, and the district had sex ratio of 93.9 males for every 100 females.⁶³ The social development of the district is low: according to the district council the adult literacy rate is under 50 per cent, and in 3 of the 5 wards for which data is available, more than 40 per cent of children under 5 were found to be underweight. The district council is aware of gender-based inequities in the district, noting that “about 90 per cent of women” engage “in agriculture and livestock keeping, do not have equal rights to assets (including land) and have limited access to finance and education”.⁶⁴ This makes them more “vulnerable to poverty”. The Mara region ranks 9th out of 21 regions in Tanzania's gender development index.⁶⁵ According to the 2015 – 2016 Demographic and Health Survey, in the region 22 per cent of women have no say over major household decisions, 89 per cent of women think that wife-beating is acceptable, 61 per cent of women have been subjected to physical violence and 23 per cent of women have been subjected to sexual violence, and 32 per cent of women have undergone FGM.⁶⁶

59 Unless otherwise indicated, all quantitative data found in this Section for Ngorongoro is taken from Ngorongoro District Council (2017) 'Ngorongoro District Council Medium Term Strategic 2016/17 – 2020/21', available from the district council.

60 <http://hdr.undp.org/sites/default/files/thdr2014-main.pdf> (accessed on 2 April 2018).

61 <https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf> (accessed on 2 April 2018).

62 Ngorongoro District Council (2017) 'Ngorongoro District Council Medium Term Strategic 2016/17 – 2020/21', available from the district council.

63 Unless otherwise indicated, all quantitative information found in this section for Bunda is taken from the following Bunda District Council reports: 'Bunda District Council Strategic Plan 2011/12 – 2015/16'; 'Bunda District Socio-Economic Profile 2014'; and 'Bunda District Socio-Economic Profile 2016 [Draft]'. All are available from the district council. It should be noted that some of the publications demonstrate significant discrepancies; for example, population estimates.

64 Bunda District Council (2011) 'Bunda District Council Strategic Plan 2011/12 – 2015/16', available from the district council. It should be noted that some of the publications demonstrate significant discrepancies; for example, population estimates.

65 <http://hdr.undp.org/sites/default/files/thdr2014-main.pdf> (accessed on 2 April 2018).

66 <https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf> (accessed on 2 April 2018).

Moreover, with the exception of one ward, there is very limited women's employment by the district council at the managerial level or higher.

Ikungi is a new district consisting of 4 divisions, 28 Wards, 101 villages and 545 hamlets. Based on the 2012 National Population and Housing Census, the total population of the district is 272,959, and the district had a sex ratio of 99.6 males for every 100 females.⁶⁷ Average household size was 5 - 6 members, and the dependency ratio was 1.14. The literacy rate for the district is 62.9 per cent. The district council has found that 37 per cent of the population do not get enough food to satisfy themselves, which is not surprising given its estimates that per capita income is around TSH725,000 per year. The district council is aware of gender-based inequities in the district, stressing that “measures have been put in place to minimize time spent by women and girls in attending home activities”,⁶⁸ and in so doing recognizing the impact of the performance of unpaid care and domestic work on the capacity of women to work outside the home. However, the Singida region ranks 20th out of 21 regions in Tanzania's gender development index.⁶⁹ According to the 2015 – 2016 Demographic and Health Survey, in the region 14 per cent of women have no say over major household decisions, 64 per cent of women think that wife-beating is acceptable, 31 per cent of women have been subjected to physical violence and 10 per cent of women have been subjected to sexual violence, and 31 per cent of women have undergone FGM.⁷⁰

Kibondo district consists of 3 divisions, 19 wards, 50 villages and 420 hamlets. According to 2012 National Population and Housing Census report, Kibondo district had a population of 261,331 and a sex ratio of 91 males per every 100 females.⁷¹ Average family size is 5. Social development, in terms of educational attainment and health status, is below national expectations. The district council estimates per capita incomes are around TSH705,000 per year. That the district council is aware of gender-based inequities in the district is demonstrated when it writes that the “majority of people in the district drink alcohol that is locally processed. They often use their annual yields such as grains, banana and cassava or spend their meagre earnings on local beer;”⁷² alcohol consumption in rural Tanzania is strongly gendered, in that men are far more likely to consume local alcohol and far more likely to use their cash incomes for such purchases. The Kigoma region ranks 21st out of 21 regions gender development index.⁷³ According to the 2015 – 2016 Demographic and Health Survey, in the region 21 per cent of women have no say over major household decisions, 76 per cent of women think that wife-beating is acceptable, 43 per cent of women have been subjected to physical violence, and 23 per cent of women have been subjected to sexual violence.⁷⁴

2. Farming system characteristics

Table 1 presents some of the key farming characteristics of the four districts. Across all four districts, the key economic activities are crop production and livestock keeping, which can be done together with farming, in the form of agro-pastoralism. In Bunda, agriculture employs around 85 per cent of the total

67 Unless otherwise indicated, all quantitative information in this Section is taken from the following Ikungi District Council reports: 'Ikungi District Council Medium Term Rolling Strategic Plan for the years 2014/15 – 2018/19'; and 'Ikungi District Council Socio-Economic Profile 2015 [Draft]'. These are available from the district council. It should be noted that there are discrepancies between the two publications.

68 Ikungi District Council (2014) 'Ikungi District Council Medium Term Rolling Strategic Plan for the years 2014/15 – 2018/19', available from the district council.

69 <http://hdr.undp.org/sites/default/files/thdr2014-main.pdf> (accessed on 2 April 2018).

70 <https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf> (accessed on 2 April 2018).

71 Unless otherwise indicated, all quantitative information in this Section is taken from the following Kibondo District Council report: 'Kibondo District Council Socio-Economic Profile 2016'. This available from the district council.

72 Kibondo District Council (2016) 'Kibondo District Council Socio-Economic Profile 2016', available from the district council.

73 <http://hdr.undp.org/sites/default/files/thdr2014-main.pdf> (accessed on 2 April 2018).

74 <https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf> (accessed on 2 April 2018).

population and generates 38 per cent of district GDP, according to the district council.⁷⁵ In Ikungi, 80 per cent of the district's residents rely on agriculture for their livelihood.⁷⁶ In Kibondo district, 87 per cent of the district's residents rely on agriculture for their livelihood.⁷⁷ In Ngorongoro, agriculture has become an increasingly important economic activity, particularly in Sale and Loliondo divisions, where about 80 per cent of the people are engaged in crop production; however, some 44 per cent of the population would be considered agro-pastoralists by the district council,⁷⁸ which is the largest share across the four districts.

District/village	No in FGDs	Average farm size	Key crops	Polygamy?	Gender gap?
<i>Ngorongoro</i>					
Sakala	32	2 – 3 acres	Maize, beans	Y	Y
N'garwa	17	1 – 5 acres	Maize, beans	Y	Y
Samunge	21	N/A	Maize, beans, sunflower	Y	Y
Digodigo	22	1 – 3 acres	Maize, beans, millet, cassava, sweet potato	Y	Y
Oloipiri	34	2 – 3 acres	Maize, beans, sunflower	Y	Y
Ololosokwan	18	1- 10 acres	N/A	Y	Y
<i>Bunda</i>					
Mariwanda	25	1 – 15 acres	Maize, rice, sorghum, cotton, sweet potato	Y	Y
Namhura	50	N/A	N/A	Y	Y
Chingurubira	33	N/A	N/A	Y	Y
<i>Ikungi</i>					
Kimbwi	35	3 – 4 acres	Sweet potato, sorghum, pea millet	Y	Y
Makiungu	22	1 – 3 acres	Sunflower, finger millet, sweet potato, maize, sorghum	Y	Y
Kipunda	22	5 – 30 acres	Sunflower, finger millet, horticultural crops, sweet potato, maize	Y	Y
Mnangana	42	2 – 3 acres	Sunflower, cassava, horticultural crops, sweet potato, maize, sorghum	Y	Y
Mbwanjiki	43	3 – 5 acres	Sunflower, sweet potato, horticultural crops, sorghum, maize	Y	Y
<i>Kibondo</i>					
Kitahana	23	1 – 5 acres	Maize, cassava, beans, sorghum, plantain, groundnuts	Y	Y
Kibingo	24	3 – 15 acres	Maize, cassava, beans, sorghum, groundnuts, rice, sweet potato	Y	Y
Kilalagon	23	1 – 2 acres	Maize, beans, groundnuts, cassava	Y	Y
Kumhasha	27	1 – 2 acres	Horticultural crops, maize, beans, cassava, groundnuts	Y	Y

75 Bunda District Council (2011) 'Bunda District Council Strategic Plan 2011/12 – 2015/16', available from the district council. It should be noted that some of the publications demonstrate significant discrepancies; for example, population estimates.

76 Ikungi District Council (2014) 'Ikungi District Council Medium Term Rolling Strategic Plan for the years 2014/15 – 2018/19', available from the district council.

77 Kibondo District Council (2016) 'Kibondo District Council Socio-Economic Profile 2016', available from the district council.

78 Ngorongoro District Council (2017) 'Ngorongoro District Council Medium Term Strategic 2016/17 – 2020/21', available from the district council.

Twabagondozi	34	1 – 5 acres	Rice, maize, cassava, groundnuts, beans, sorghum, horticultural crops	Y	Y
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All four districts demonstrate fundamental similarities in their agricultural practices. Farming systems in the four districts reflect three distinct aspects: rural household structure, and most centrally the prevalence of polygamous marriage practices and patriarchal asset ownership; the agroecological landscape within which farming and pastoralism takes place; and the impact of climate change on decision-making. In terms of asset distributions, when women marry they marry into a household and rely upon their husband or their husband's family for any land on which they work. That land is customarily-held by senior men within households over the generations, and so men within households say that they “own” the land, even though they have no formal title to it. As one male farmer in a focus-group discussion in Sakala village in Ngorongoro district stated, “women are not aware of their rights”. Indeed, in Ngorongoro district widows faced pressure from male relatives who wanted to re-assume “ownership” of land controlled by widows, and many women in such circumstances did not defend their rights, in part because, as was said by a man in another district, “70 per cent of women don’t know about their rights”. Thus, a foundation of women's status is that the only asset that they bring into a marriage is their labour; as one woman in Kipunda village in Ikungi district noted, “when you got married you come with nothing”.

In all four districts the bulk of agricultural production comes from subsistence-oriented smallholders, who are significantly constrained in their productive activities. Farms cultivate small- to moderately-sized plot of land of between 1 and 5 acres, although a significant minority of households have larger holdings of land; one household in Ikungi district held over 100 acres. In Ikungi arable land is only 33 per cent of total land in the district, and only 50 per cent of arable land is being utilized for crop production.⁷⁹ The district council notes that only 50 hectares is irrigated. In Kibondo arable land is less than 26 per cent of total land in the district.⁸⁰

Inadequate stocks of capital mean that land is usually prepared by hoe, but agro-pastoralists often prepare land using cattle-drawn ploughs or, occasionally in Ngorongoro, tractors. Generally, though, the use of “modern” tools and equipment is rare. Most women and men plot operators in the four districts use low-yielding local varieties of seed for planting, although some men use improved seed for maize production. In Ngorongoro district farmers do not use organic or industrial fertilizers; as one male farmer in Sakala village in Ngorongoro district stated, fertilizers “kill the land”, even though local agronomists from the district council noted that there was a need to enhance soil fertility. In Bunda and Ikungi districts some farmers use farm yard manures on their farm plots, indicating the extent to which, when fertilizers are used at all, they are primarily organic. Pesticides are used by a minority of farmers in the districts, and in small quantities. Most farms in the districts rely on rain fall as their source of water, which is an issue because in the wake of climate change there has been an increased occurrence of variable rainfall and drought, and thus water shortages. As a man from Chingulubira village in Bunda district noted, “rainfall is not reliable”. Credit facilities are, at best, underdeveloped and, at worst, non-existent.

Agriculture in the four districts produces cash crops for sale, subsistence crops for a household's own-use as food, and flex-crops for sale or own-use. Food and flex-crops in the districts include maize, cassava, sorghum, sweet potatoes, finger millet, beans, pigeon peas and, in some cases, paddy.

⁷⁹ Ikungi District Council (2014) 'Ikungi District Council Medium Term Rolling Strategic Plan for the years 2014/15 – 2018/19', available from the district council.

⁸⁰ Kibondo District Council (2016) 'Kibondo District Council Socio-Economic Profile 2016', available from the district council.

Sunflower, horticultural crops, cotton, tobacco and groundnuts are the principal cash crops. Some crops are grown only by men on plots that they manage. These tend to be cash and flex crops, although it should be noted that horticultural crops, which are grown to be sold, are only grown by women. Women take principal responsibility for the production of food crops for household subsistence.

All the districts stress that yields are low and increasingly variable because of climate change. In Kibondo the average yield for maize is 2.65 tonnes per hectare; for beans it is 0.86 tonnes per hectare, and for cassava it is 3.9 tonnes per hectare.⁸¹ In Ngorongoro the district council estimates yields of maize per hectare at only 2 tons, while district planners estimate the potential yield as being between 5 and 7 tons of maize per hectare, indicating the extent to which farming is underperforming.⁸²

Across the districts many households own small stocks of livestock, as farmers try and supplement their livelihoods by holding some cattle, goats, sheep and chicken. Those in Ikungi that live in and around Lake Victoria may also engage in the local fisheries. A few households may have significantly larger herds of livestock, and a very few households have very large stocks of livestock, particularly in Ngorongoro district, where livestock keeping or pastoralism is generally the largest economic subsector, according to district council data, with over 80 per cent of the population engaging in it.⁸³ While in Ngorongoro district as a whole there are 10 units of livestock per family of four, the reality is that 80 per cent of the livestock is controlled by 20 per cent of the population.⁸⁴ Pastoralism in Ngorongoro is facing significant pressures, according to the district council. Overgrazing is taking place on increasingly-scarce grazing land, and this has been exacerbated by climate change-induced droughts and recurrent water shortages. In all four districts cattle is a male domain in that on the rare occasions that women might buy livestock it would be deemed to belong to the man,

Post-harvest handling processes and inadequate transport logistics further reduce the value of any agricultural surpluses, which are marketed primarily in local markets where prices are low due to a lack of integration into value chains. The result is relatively low cash revenues from crop and livestock marketing. It is important to note that in the vast majority of cases husbands make marketing decisions, whether it be of livestock, cash crops or flex-crops. As a man from Chingurubira village in Bunda district put it, “at the end of the day we control all the harvest from all the farm's plots”. Money that is earned from the marketing of livestock, cash and flex-crops by husbands is not shared with their wives; the husband controls the money and decides how the money is used. As a woman from Samunge village in Ngorongoro district put it, “we are not allowed to speak what is on our mind” when it comes to the use of income.

Low revenues from agricultural activities are accentuated by farming-induced soil erosion and the variable rains arising from climate change, which together drive environmental degradation in the districts. In Kibondo, environmental degradation has also been effected by the influx of a large number of refugees, who have cut trees, among other impacts, according to district planners. The district council has initiated an afforestation programme to try and offset some of the deleterious impacts of climate change, but has been significantly constrained by budgetary limitations. Similarly, in Ikungi the district council has initiated a tree planting programme to try and offset some of the deleterious impacts of climate change. Nonetheless, there is no doubt that climate change has had an impact on both

81 Kibondo District Council (2016) 'Kibondo District Council Socio-Economic Profile 2016', available from the district council.

82 Ngorongoro District Council (2017) 'Ngorongoro District Council Medium Term Strategic 2016/17 – 2020/21', available from the district council.

83 Ngorongoro District Council (2017) 'Ngorongoro District Council Medium Term Strategic 2016/17 – 2020/21', available from the district council.

84 Some in the district council believe that 80 per cent of the livestock in the district is controlled by 3 per cent of the population.

pastoralism and crop production, and with limited livelihood options has contributed to food insecurity in the districts. In Ngorongoro, the district council says that food insecurities have contributed to land conflicts between farmers, pastoralists, and agro-pastoralists.

3. Drivers of the gender gap in agricultural productivity in the districts

Table 2 draws together the results from the 4 districts, summarizing the principal findings of the qualitative investigation into the three most important drivers of the gender gap in agricultural productivity across 19 villages, as identified by the respondents. Table 2 displays some clear regularities. Therefore, Table 3 goes beyond Table 2 by identifying, in order of importance, the most important drivers in Table 2 for each of the three rankings, in order to tease out whether any deeper patterns can be revealed. In so doing, Table 3 presents what this study identifies as the key drivers of the gender gap in agricultural productivity in Tanzania.

	No in FGDs	1 st most important driver	2 nd most important driver	3 rd most important driver
<i>Ngorongoro</i>				
Sakala	32	Women's unpaid care and domestic work	Women's cash responsibilities	None identifiable
N'garwa	17	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
Samunge	21	Women's unpaid care and domestic work	Women's unpaid family farm labour	Economic effects of gender-based violence
Digodigo	22	Women's unpaid care and domestic work	Economic effects of gender-based violence	Women's cash responsibilities
Oloipiri	34	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
Ololosokwan	18	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
<i>Bunda</i>				
Mariwanda	25	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
Namhura	50	Women's unpaid care and domestic work	Women's unpaid family farm labour	Economic effects of gender-based violence
Chingurubira	33	Women's unpaid care and domestic work	Women's unpaid family farm labour	None identifiable
<i>Ikungi</i>				
Kimbwi	35	Women's unpaid care and domestic work	Economic effects of gender-based violence	Women's cash responsibilities
Makiungu	22	Women's unpaid care and domestic work	Women's unpaid family farm labour	Economic effects of gender-based violence
Kipunda	22	Women's unpaid care and domestic work	Women's unpaid family farm labour	Economic effects of gender-based violence
Mnangana	42	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
Mbwanjiki	43	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
<i>Kibondo</i>				
Kitahana	23	Women's unpaid care and	Women's unpaid family farm	Economic effects of gender-

		domestic work	labour	based violence
Kibingo	24	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
Kilalangon	23	Women's unpaid care and domestic work	Women's unpaid family farm labour	Women's cash responsibilities
Kumhasha	27	Women's unpaid care and domestic work	Women's unpaid family farm labour	Economic effects of gender-based violence
Twabagondozi	34	Women's unpaid care and domestic work	Women's unpaid family farm labour	Economic effects of gender-based violence

Table 3. Tanzania gender gap analytical matrix

		Cases
Total number of villages	19	
Total number of HH	8768	
Total number in FGDs	547	
Most important first driver	Women's unpaid care and domestic work responsibilities	19 of 19
Second most important first driver	None	0 of 19
Second most important driver	Women's responsibilities to provide unpaid family farm labour	16 of 19
Second most important second driver	Economic consequences of gender-based violence	2 of 19
Third most important driver	Women's responsibilities to provide cash to meet family needs	10 of 17
Second most important third driver	Economic consequences of gender-based violence	7 of 17

In what follows, Table 3 will be discussed in light of the analytical framework discussed in Section II above and in light of the findings of the 2015 Report.

i. Unpaid care and domestic work's impact on agricultural productivity

In the 19 villages the performance of unpaid care and domestic work was far and away the most significant constraint on women's time. Unpaid care and domestic work commonly has to be done at specific times and in specific locations, and these activities are socially necessary for members of a household to prepare themselves for the work day, whether it be on the land, as a casual waged labourer, or in school, while at the same time these activities build social and human capital. Women have the responsibility to maintain the home, care for children, and ensure that food was available and prepared. As a result, across both the rainy and the dry season women rose earlier in the day than men; during the day when men rested women were performing unpaid care and domestic work; and when men had time for leisure activities women were performing unpaid care and domestic work. In addition to these tasks, both the collection of firewood, as a source of energy, and the collection of water were time-consuming activities in the four districts, tasks that have been made more demanding by climate change. As a woman in Sakala village in Ngorongoro district noted, “nowadays, because of drought, you have to travel a much longer distance before you find water”, while another woman in the same focus group said that “people are destroying trees in the search for firewood”. As a consequence,

unpaid care and domestic work could easily absorb between 5 and 7 hours of women's working day, acting as an important constraint on their ability to work on their plots of land because it reduces labour availability. As one woman in Ikungi district said, if there was a need for firewood, she “didn't go to the farm”. Moreover, due to the gender-specific assignment of intra-household and on-farm tasks, any change affecting the family, the farm or the environment can have different implications for men and women's time use. For example, an unexpected illness in a household will cause a substantive increase in the time needed to care for the sick family member.

The performance of unpaid care and domestic work has an opportunity cost: it limits women's flexibility in their choices by reducing labour availability for on-farm and off-farm work, and by reducing labour availability has an impact on the cash and non-cash resources that women are able to generate. In this light it can be suggested that there is a connection between unpaid care and domestic work and the lesser productivity of women's plots of land: fewer labour inputs would suggest less productivity. Interventions that save labour in unpaid care and domestic work, such as improved access to water and improved access to energy, could in the short run free up valuable time that women could spend working on their plots. Moreover, this has implications for the performance of the agricultural sector more generally. When labour is diverted out of farm work it not only reduces the amount of labour required for the timely application of good agronomic practices, including CSA practices, but also reduces the time available for seasonal and time-demanding mitigation measures that can reduce environmental vulnerability. Having said that, though, unpaid care and domestic work provides substantive benefits to households, communities and society as a whole, which are not compensated. Indeed, it means that men do not have an incentive to increase their contribution to unpaid care and domestic work, because they benefit from its performance in any event.

In the longer term the social norms and values that assign women to the performance of unpaid care and domestic work within communities need to be addressed if labour availability for women's plots, and hence the productivity of women's plots of land, are to be improved. Moreover, the income foregone because of the social expectation that women will perform unpaid care and domestic work reduces women's purchasing power, the ability to hire casual labour, purchase pesticides and buy better agricultural implements, all of which can have an effect on agricultural productivity. This increases women's poverty and their lack of economic power relative to men

ii. Labour availability for own-plot production and agricultural productivity

The field work done for this study has thrown up a hitherto little-remarked aspect of farm production practices in Tanzania. In farming social expectations govern on-farm labour allocation. Women's availability to work on the plots of land that they independently operate is significantly constrained by social norms and values that produce the expectation that they will work on plots that are jointly operated with their husbands or will work on their husband's plots of land before undertaking any work on their own plots of land. This expectation has important implications for women's time use.

In monogamous marriages men and women work together, but perform different tasks. There were, in the words of one respondent, “separate spheres” of responsibility in terms of the type of farm work performed. Moreover, women's work on jointly operated plots is very commonly much more than the amount of work that is performed by their husbands, as was indicated by the women respondents in the villages. Nonetheless, despite their work on jointly operated plots being greater than that of their husbands, it is the husbands that control the crop that is produced on the jointly operated plot, deciding when production is surplus to household requirements, deciding when and where the crop will be disposed of, and retaining control of the cash generated by crop disposal. At best, wives receive a fraction of the cash generated by crop disposal, and even then wives do not know what that fraction is

with regard to the total amount of cash that is earned because this information is not shared by husbands with their wives.

In polygamous marriages senior wives are assigned plots of land to manage by their husband, who tends to reside with the most junior wife. Thus, polygamous households have two types of farm plots: those controlled by husbands, which are commonly if misleadingly referred to as joint plots, and those controlled by wives, which tend to be inferior in terms of land quantity and land quality. The plots of land controlled by women are used to provide food for the wives' household, including the husband when he chooses to eat with them. As one woman in Sakala village in Ngorongoro district stated, the land that wives are assigned is “to get food for the family and money to help the kids, but you don't get a sufficient piece of land, just a small-sized plot”. As a woman in Oliopiri village in Ngorongoro district stated, “my husband has ten other wives. I take care of myself and my children. I work together with my children on the farm. I graze the animals, I fetch water, I collect firewood, I cook, I milk the cows and goats. I don't rely at my husband at all”.

However, before being able to work on their plots of land senior wives are expected to work on their husband's plots of land, and only when their tasks on the husband's plots are completed can they commence work on the plot that they have been assigned by their husband. As one woman in Chingulubira village in Bunda district noted, “we first work on our husband's plots. When we commence weeding our plots, the grasses are already much taller, and this lowers the yields on our plots”. Indeed, in one women's-only group in the Ngorongoro district, one respondent put what many said very succinctly: that husbands were “dictators”. What she meant by this was not only do women contribute work to their husband's farm plots, they often contribute the bulk of the labour used on their husband's farm plots; husbands effectively act as the managers of women's time in on-farm labour, and not as co-workers. Thus, work on the husband's plots of land constitutes a significant claim on the time of his senior wives, and this time also has an opportunity cost: when working on the husband's plot the wife is unable to work on her plot of land, reducing labour availability to work on the wife's plot of land. This is another reason why women respondents said that they did not have enough time to spend on their plots of land. This can reduce the labour available on the women's plots at specific times of the growing cycle when CSA practices should be followed, such as early harrowing, early planting, and early weeding, exacerbating women's vulnerability to climate change.

At the same time, because the crop that is produced on the husband's plot of land is controlled fully by the husband polygamous marriages can be seen as a form of labour mobilization of women for production by husbands. Indeed, in some instances, this is a very conscious choice: men accumulate the cash incomes that their wives generate and invest it in securing a new junior wife, thereby increasing the labour supply available to work on the husband's land, with implications for the production and productivity of men's plots, and hence male incomes. As an example, the Chapakazi Agricultural and Marketing Cooperative Society in Kibondo had been formed by husbands to grow tobacco; less than 5 per cent of the membership were female. As a group of contract farmers, they had received loans to purchase inputs. The farmer's group then relied heavily on the unpaid contributing farm labour of their wives to grow what is a labour-intensive crop. When the crop was sold, the husbands did not share their incomes with their wives but acquired new wives; a few bought vehicles, while others built houses in town to rent out. Interestingly, the use of tobacco incomes to acquire new wives meant that the husbands effectively reinvested their earnings in expanding their unpaid labour supply so that their earnings could further rise. In other words, the profitability of tobacco farming was predicated on a gender-biased pattern of asset ownership and the use of a labour force mobilized into production on the basis of intra-household gender relations. While the terms and conditions of husband's tobacco sales meant that the group was adversely incorporated into tobacco markets, their wives were in a significantly worse position.

The Chapakazi Cooperative demonstrates a key point: women respondents in the villages commonly stated that men worked less than they claimed to be working on their plots of land, and that women worked significantly longer on their husband's plots of land than did the husbands themselves. It would appear that men consistently over-reported their labour contribution on their plots and consistently under-reported the labour contribution of their wives on their plots. Finally, it needs to be stressed that according to women respondents husbands by and large are not willing to work on the land that their senior wives control at all, which, as indicated in the 2015 Report, reduces the total labour available to work on women's plots of land. Thus, in many instances it is far more useful to understand husbands as being effectively managers of wives' labour, which is being performed to increase the income available for the husband.

The opportunity cost of wives having to perform unpaid contributing farm labour, especially when the output of that labour is not controlled by the person doing the work, is clear: it reduces women's labour availability for work on their plots of land, and with lower labour inputs it can be expected that productivity is effected. This means that in the longer term the social norms and values that assign women to the performance of unpaid contributing family farm labour on plots where the output is not controlled by the woman doing the work needs to be addressed if the productivity of women's plots of land are to be improved.

iii. The role of limited cash incomes on agricultural productivity

As noted, women have the responsibility to ensure that food is available and prepared. This means that when women's plots of land fail to generate sufficient quantities of food for household consumption, women have a responsibility to obtain money to buy food requirements. In addition, women have to obtain money to pay for clothing, health care, school fees and such, because expenses for household maintenance are considered to be the responsibility of a wife. Conversely, money that is earned by husbands from the marketing of livestock, cash and flex-crops is not shared with their wives; the husband controls the money and decides how the money is used. As a woman from Samunge village in Ngorongoro district put it, “we are not allowed to speak what is on our mind” when it comes to the use of income. The women's-only groups reinforced this finding, noting that wives have no idea what their husband's money is used for and have no idea where it goes. The lack of redistribution of cash incomes within the household by husbands strongly reinforces the need for the wife to undertake casual waged labour and petty trading to earn the money necessary to meet household maintenance needs. This has three results. First, women perform extensive casual waged labour for cash. As a woman in Digodigo village in Ngorongoro district said, “we had to go to Loliondo to sell labour to make money for our families”. It should be noted that while men also do casual waged labour for cash, according to women's-only groups men do not share the earnings that they make from casual waged labour. Second, women may sell some of the flex-crops from their plots to obtain cash to meet household maintenance needs. Third, it is no wonder that one key informant said that “women seem tired all the time”.

It should also be noted that some respondents indicated that husbands would take food crops grown on the wives' plots that are stored for future use and give them to another wife for their use or sell the food for cash, without consulting the wife that grew the food; as a woman from Twabagondozi village in Kibondo district put it, “our husbands sometimes steal crops stored for food in the household so that they can go and sell to get money”. In such circumstances, intra-household food shortages would also necessitate the wife undertaking casual waged labour or petty to earn the money necessary to overcome the shortage, reducing labour availability for work on their own plots of land.

In Table 3 the requirement that wives meet all the cash needs of the household is identified as being the third most important driver of the gender gap in agricultural productivity. However, this needs to be

discussed, because this too has implications for women's time poverty and the productivity of their plots of land. With men contributing at best only a fraction of their cash incomes to the maintenance needs of the household, households depend on production from the wife's plot, which is all too often insufficient to meet the household's food requirements, thus causing food insecurity and poor nutrition among household members. However, the opportunity cost of undertaking casual on-farm and off-farm waged labour or engaging in petty trading is a lesser amount of time that is available to work on women's plots of land, which, because it cuts labour availability, has implications for women's farm production and farm productivity. Moreover, when women do participate in markets, gender relations strongly permeate their operation, with the result that information is asymmetrically distributed and so cannot benefit men and women equally. In the Masai community, for example, women are prohibited from selling agricultural products; if women do opt to sell crops or livestock they will be given a lower price because they are a woman. As a consequence of gender relations being embedded within markets, markets are far from being perfect, as they are often incomplete, fragmentary, or missing.

iv. Gender-based violence and agricultural productivity

The gender disparities in the 4 districts have already been documented. Gender-based violence is to a large extent deployed by some men in the villages in order to ensure that their choices are enforced within the household. Men that use gender-based violence can take control of cash and non-cash resources generated by women, including loans that women take from village savings and loan groups. Men that use gender-based violence can enforce labour allocation decisions that they make regarding the use of their wives' labour on their plots. Men that use gender-based violence ensure the performance of unpaid care and domestic work by women, and especially food preparation for men. Men that use gender-based violence force women into having intimate relations. Finally, men that use gender-based violence do so to discipline women, most notably when they return from collecting firewood or water or when they return from marketing their crops. In all instances, when gender-based violence is used the social power of husbands over their wives is asserted. As a man from Chingurubira village in Bunda district put it, quite bluntly, "wife beating here is very normal". A woman from Oliopiri village in Ngorongoro district said that her husband wanted "food to be ready when he comes back home. If not, he beats me and all my children". In polygamous marriages, that power is greater, but in monogamous marriages that power is ever-present. Indeed, it is worth noting that in the regions of Arusha, Kigoma, Mara and Singida the percentage of ever-married women aged 15 – 49 who have ever experienced physical, sexual or emotional violence from their husbands runs from a low of 44 per cent in Singida to a high of 78 per cent in Mara.⁸⁵ Thus, a significant number of men use gender-based violence or the threat of it, at some point, in order to enforce their intra-household power in the villages that were visited.

Gender-based violence helps explain gender gaps in agricultural productivity. As a consequence of gender-based violence, women may be less able or unable to work for periods of time, whether that be in unpaid care and domestic work, on plots of land, or in casual waged labour or petty trading. A woman in Samunge said that she "decided to sell a goat to get some money for medical purposes. As a result, when my husband was back, I was severely beaten, injured and admitted to hospital for treatment." When women are less able to work on plots of land, less labour is available for farm work, which can have implications for agricultural productivity, depending on the period of cropping cycle in which the gender-based violence takes place. When women are not able to undertake casual waged labour or petty trading because of gender-based violence, less income is available for household maintenance needs – which can ironically trigger more gender-based violence on the part of some

85 <https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf> (accessed on 2 April 2018).

husbands. At the same time, because some husbands may use gender-based violence to seize cash and non-cash resources produced by their wives, there is a disincentive on the part of wives to save cash and non-cash resources precisely because it may be seized. Moreover, the use of gender-based violence by some husbands serves as a disincentive for wives to invest in improving the productivity of their plots of land, precisely because the husband may use gender-based violence to seize cash and non-cash resources that wives produce. Thus, gender-based violence on the part of some husbands can serve to reduce the labour supply, reduce cash incomes, reduce the incentive to save, and reduce the incentive to invest in the agricultural inputs, technologies and other related factors that may contribute to productivity gains in climate-smart ways. It can also effect the ability to hire-in casual men's labour to work on women's plots. All these have economic consequences for agricultural productivity while also limiting the ability of households to meet their food security objectives and ameliorate the poverty that they may face.

To be clear, it is not being suggested that an elimination of gender-based violence will lead to an equalization of agricultural productivity on plots operated by women and men. It does suggest though that gender-based violence is at least connected with the lesser productivity of women farmers in Tanzania and that the social norms and values that render gender-based violence acceptable to some community members needs to be addressed if the productivity of women's plots of land are to be improved. Having said that, the experience of gender-based violence should not be reduced to an issue of the denial of economic rights alone because it can hinder the participation of women and children in the community simply due to embarrassment, stigma, or mental and emotional trauma.

v. Agricultural productivity, gender, climate change, and extension services

With limited time and limited cash incomes, it is not surprising that women plot operators utilize different technical coefficients of production than men plot operators. With cash incomes devoted to household maintenance, they are less able to use the improved agricultural technologies that men use: they use fewer improved tools and equipment, they are less likely to use improved seeds, and they are much less likely to use chemical fertilizers, pesticides and herbicides. Thus, intra-household responsibilities, as a result of social norms and values, have an effect upon the kinds of technological choices that are available to women plot operators, and this contributes to lower levels of agricultural productivity. This is not to say that reducing time poverty and increasing cash incomes will result in accessing improved technologies; rather, reducing time poverty and increasing cash incomes is a necessary, but not sufficient, condition for improving access to technologies.

It can be strongly inferred from the respondents that the technical coefficients of production for both men and women farmers are impacted by the lack of a presence of agricultural extension officers in the villages. In one village in Ikungi district there was a very active agricultural extension officer that had provided extensive advice, but that was the exception to the rule, particularly because agricultural extension officers lack the budgetary resources to visit the villages to which they are assigned. As one man in Oliopiri village in Ngorongoro district stated, "extension officers are not readily available". Many respondents insisted that they needed better agricultural extension services in order to cope with increased climate-induced variability in the weather, and hence in production. However, across the villages agricultural extension officers were absent, and so the introduction of new, often climate-friendly, agronomic practices was haphazard and un-coordinated. There can be very little doubt that agricultural extension officers are capable of doing much, much more to support their communities, and moreover are capable of doing this in a gender-responsive way, although this would require a significant increase in budgetary resources.

A possible enhanced role for agricultural extension service officers also applies to the introduction and

adoption of CSA practices. These include:

- conservation agriculture, which is a set of soil management practices that minimize the disruption of the soil's structure, composition and natural biodiversity caused by farming in order to sustain soil micronutrients;
- crop variety selection, which emphasizes selections that are early-maturing, drought-resistant and high-yielding;
- manuring, using animal waste, which contributes to the maintenance of soil micronutrients;
- rainwater harvesting, in order to promote crop responsiveness and sustain yields; and
- agro-forestry, which contributes to the sustenance of soil structure, composition and biodiversity.

In the 4 districts some farmers, whether women or men, already practice some elements of CSA, including intercropping maize and beans, switching to more drought-tolerant crops, switching to more drought-tolerant crops, switching to shorter maturing seeds, manuring in Ngorongoro and Bunda districts, applying the judicious use of water, and tree planting; however, these practices are not as effective or as coordinated as they could be because of lack of knowledge. For example, integrated agro-forestry practices would reduce the time required for women to collect firewood, improve water sources and increase soil fertility. However, the leaders of only one village in Ikungi district had received training in CSA practices, and many people have responded to climate change by simply praying for rain. Indeed, the poor application of CSA practices by some farmers can contribute to environmental degradation, lower soil fertility, and also exacerbate complementary environmental effects that cumulatively lower farm productivity, household food security and nutrition.

Climate-smart agricultural practices are often time consuming, and the provision of CSA knowledge through agricultural extension services is a prerequisite for their effective adoption on farm plots; however, an adequate amount of time and labour is also needed. In all 4 districts both farmers and district agricultural officials displayed very little knowledge of CSA, due to both a lack of extension services to farmers as well as the infrastructure needed to facilitate delivery of extension services by extension officers; indeed, many villages lack extension officers and key CSA documents are not available at the district level.

The field work indicates that there does not appear to be gender-differentiated responses to the introduction of CSA practices in the 4 districts, in part because husbands manage wives' labour on their plots, and in part because of the "bounded rationality" that men and women farmers have regarding CSA practices, which was nonetheless equitably distributed among husbands and wives. The issue, rather, is a lack of knowledge of what responses might be, and this is regionally asymmetrical, depending on the adequacy of the agricultural extension services in the district.

vi. This study's findings in light of the 2015 Report

The 2015 Report found that women plot operators lacked access to enough male family labour and that male plot operators had better agricultural technologies than women plot operators. This study has found that women do not have access to adequate quantities of male family labour because they are in polygamous households or are widowed or divorced. This is a significant proportion of households, and in polygamous households in particular husbands are not willing to work on the plots of land assigned to their senior wives and moreover expect their senior wives to work on their plots of land before any other on-farm operations are carried out. This study has also found that women do not have the cash incomes needed to buy agricultural technologies identified in the 2015 Report as a driver of the gender gap in agricultural productivity. This is because they have primary responsibility to meet household cash needs, and thus household maintenance dominates the use of the cash incomes that they generate

by casual on-farm or off-farm labour or from petty trading. These inequalities reflect social norms and values that generate the expectation that the meeting of household needs is the first and foremost responsibility of women. These same social norms and values result in a gender-biased distribution of unpaid care and domestic work. Cumulatively, with men's control of women's time and labour, men's control of marketing, and men's control of the income from marketing the opportunity cost of the social norms and values that confront wives is a lesser capacity to work on- and off-farm, and this in turn results in gender-based differences in access to assets, labour services and technologies, as identified in the 2015 Report. It also makes it harder for women plot operators to adapt to the realities of climate change, even when their knowledge is similar to that of men, because of the time-consuming nature of some CSA techniques, while the agricultural technologies that might support the adoption of CSA techniques are not easily-accessible to cash-constrained women plot managers. These social norms and values are enforced through the use by some men of gender-based violence, which has economic consequences, in that it reduces women's labour availability, it reduces women's cash incomes, it acts as a strong disincentive to save, and it acts as a strong disincentive to invest, all of which impact upon the agricultural productivity of women's plots. In this light, it is principally the gender-biased allocation of unpaid care and domestic work that is the underlying economic driver of the 2015 Report's proximate findings, while gender-based violence may be deployed to enforce the gender bias in the distribution of unpaid care and domestic work. As a consequence, it might be said that it is not surprising that women plot operators have lesser levels of agricultural productivity even when controlling for poor quantities and qualities of the land they operate. Women face the barrier of time poverty and this generates lesser levels of agricultural productivity.

As a counterfactual to these findings, it is worth introducing the Amani women's group in Kibondo district. Forming in school around the performance of dancing, the women members of this group had been collectively engaged in mining gravel. During that period, gender relations mirrored that found in other fieldwork sites around the country; in the words of one woman, they got “everything from the husband”. However, the majority of the members of the group had a least 7 years of education, and the same number of years together as a group. As members of an educated women's group, they petitioned the Government for land and were assigned more than 20 acres. They did not have formal title to this land; but they were the only married women that were identified over the course of the entire fieldwork as “owning” land. The women's group was growing cassava collectively, sharing tasks, using improved seeds as well as maize. Their husbands did not work on their plots. Using cassava as a flex-crop, they would sell the cassava as a group and retain the earnings. These earnings were reinvested in livestock, improved seeds and petty trading, or in their daughter's education: primary, secondary and tertiary education. Three members of the group had daughters in college, and one member of the group had a daughter that had graduated from university. The husbands of the members of the women's group were aware that their wives had an independent income but did not seek to take control of that income from their wives.

The members of the women's group still had to work on their husband's plots, but their husbands actively worked on those plots and, according to the members of the group, work was shared. In addition, when casual waged labour was used on their husband's plots, the wives would co-supervise the work. More remarkable, receipts from the earnings of the husband's plots were also shared, although in one instance a woman admitted that she took control of all the money in order to prevent wasteful spending. The members of the women's group did not have to engage in casual waged labour; they lived in town; they had formed a savings group; and they collectively shared their unpaid care and domestic work responsibilities. However: their husbands did assist them in some of their unpaid care and domestic work responsibilities, most notably the care of grandchildren. Finally: none of the group's member's husbands had more than one wife, and none of the group's members were subjected to

intimate-partner violence. The Amani women's group demonstrates that one way of addressing the time and cash constraints on women's agricultural productivity is collective organization into self-help groups.

Historically, agricultural productivity improvements have stimulated rural transformations. Henry Bernstein (2010: 22 - 3) has identified what he calls the “four key questions” necessary to understand rural transformations: who owns what? who does what? who gets what? what do they do with it? As is demonstrated in the accounts of the 4 districts, across rural Tanzania land, the principal agrarian asset, is customarily “owned” by men. Thus, wives' access to land is not independent of their husbands; it is directly mediated by their husbands. Men therefore directly control, and often own, the most valuable stocks of rural immovable assets. This has implications for who does what. Wives work on joint plots but do not control the output from those plots. In polygamous households wives work on the land provided by their husbands; husbands work exclusively on their own plots. Moreover, in both monogamous and polygamous households women respondents stressed that husbands for the most part work significantly less on the land than do their wives; the commonly-held idea that husbands and wives cooperatively work together on jointly-controlled farms is the clear exception to the rule that was brought out by women respondents. However, in order to do such work, and prior to undertaking such work, wives are expected to perform unpaid care and domestic work in order to maintain the household. The responsibility to work for the husband while also undertaking unpaid care and domestic work cumulatively reduce the time that wives need to adequately work on their plots, which, because of lower labour inputs, helps explain the gender gap in agricultural productivity. In terms of who gets what, men control the marketing decision-making with regards to crops, and as such control flows of income into the household, which by and large they do not share with other household members. Moreover, husbands can seize crops that have been retained for food from their wives and sell them, even if such stores of food are not surplus to household needs. Conversely, wives control, to the extent that husbands do not sell, the products of their plots. This leads directly into what is done with wives' food crops and men's cash. Wives' food crops are used to feed the household because wives have principal responsibility to meet the full extent of household maintenance needs: the provision and cooking of food, of cleaning and sanitation services, of caring for children, of intra- and extra-household healthcare, and of school fees. When a wife has to meet a household maintenance need for which she requires money, such as a health expense or school fees, she may sell some of the products of her plots in order to obtain cash. When this is done, she will not share the receipts of such sales with other members of the household. Alternatively, when the need for money arises, the wife will undertake petty trading or casual waged labour; again, the cash income is not shared with other members of the household. The requirement that the wife provides all the money needed to meet household maintenance needs means that substantial parts of her time again cannot be allocated to her farm plot, again reducing the time that she can spend on her plot, while at the same time precluding spending money on farm inputs, further explaining the gender gap in agricultural productivity. Husbands, on the other hand, control the money that they obtain and use it for personal ends: drinking, eating and socializing outside the home, as well as buying the services of sex workers and indeed “investing” their earned income in acquiring a new junior wife in order to increase the amount of labour that is available to work on the husband's plot of land. Indeed, if we go beyond Bernstein's four questions and ask “what do they do to each other?” in light of these social relations, the answer is that husbands may use intimate-partner violence to maintain these highly unequal social relations with their wives because they are the principal beneficiary of these highly unequal social relations.

However, the Amani women's group demonstrated that these highly unequal social relations can change, and in the course of a generation. When educated women share their unpaid care and domestic work, in order to reap economies of scale, and are given access to an asset that they work collectively,

they can have the time to generate incomes that they control. This was used by the members of the group, in the first instance, to meet household maintenance needs, but was also reinvested in household female human capital and in improving the monetary productivity of their plots of land. It was the greater economic independence arising from having independent control of land that has had a transformative impact upon gender relations within the households of the group members. Granted, the allocation of unpaid care and domestic work continues to be gender-biased. However, by sharing these responsibilities they were individually able to reduce their responsibilities while at the same time enhancing their economic independence and in so doing change the unequal social relations within which they had been enmeshed. For the Amani women's group, the “answer” to Bernstein's “four questions” was, while not perfect, very different.

V. Policy recommendations

The analysis contained in Section IV indicates a series of gender-based constraints that, if addressed by policy, could increase women's agricultural productivity on the plots of land that they operate. Section IV identified time poverty as a constraint on the application of women's labour on women's plots, a lack of cash incomes in light of heavy responsibilities for meeting household maintenance needs, a resulting lack of access to improved agricultural technologies, a lack of assets independently controlled by women, and the need to enhance the delivery of gender-responsive climate-smart agricultural extension services. All of these contribute to gender gaps in agricultural productivity. These are addressed in 3 sub-sections, which focus: firstly, on improving agricultural performance and productivity for both women and men; secondly, on policies to transform the material and cultural foundations of existing social norms and values in order to free up the time needed to work on women's plots; and thirdly, on further research into gender constraints on agricultural productivity.

1. Agricultural interventions that can boost productivity

i. Gender-responsive climate-smart agricultural extension services can improve productivity

There can be little doubt that agricultural extension services in rural Tanzania have become at best highly variable since the 1990s and at worst have all but broken down. Yet it is clear that if farmers are going to learn to farm in a more effective manner, adopt better farming methods, and become more productive, they need access to agricultural extension services. Moreover, the adoption of more gender-responsive CSA practices is necessary to deal with ongoing processes of climate change. Finally, respondents specifically requested access to agricultural extension services. This will require extensive training from qualified and equipped agricultural extension officers.

Many CSA practices are already being undertaken in villages in Tanzania, albeit in a fragmentary and un-coordinated fashion, and without the support of agricultural extension officers. There is therefore an urgent need to rebuild Tanzania's agricultural extension system, ideally by placing agricultural extension officers directly in villages where they can train women and men plot operators. However, this recommendation must be embedded within a realization that the constraints facing men and women farmers need not be the same.

Rendering CSA practices gender-responsive requires recognizing the gender-segmentation of cropping decisions and on-farm tasks and putting in place practices that promote cooperative on-farm decision-making and task allocations in order to maximize yields in climate-friendly ways. Many farmers, whether women or men, already practice elements of climate-smart agriculture, such as intercropping maize and leguminous crops. What is required is the allocation of adequate budgetary resources and the systematic training of agricultural extension officers so that they can integrate climate-smart agronomic practices into gender-responsive training and capacity-building at the village level. Moreover, there is a

need to develop practices that are time-saving rather than time-consuming. The task is urgent, given the extent to which climate change is disrupting the performance of the agricultural sector, with very strong implications for the capacity of the country to foster economic growth, poverty reduction, accomplish the objectives of Vision 2025, and achieve the SDGs.

ii. Gender-responsive climate-smart ICT-based agricultural extension services can improve productivity

The use of low-cost information and communications technologies (ICTs) has a strong potential to enhance women's and men's access to accurate and reliable information regarding gender-responsive climate-smart agricultural practices. Small-scale women and men farmers with mobile phones in Tanzania constitute a majority of the rural population, which makes Tanzania one of the countries in Africa with the highest number of mobile phone users in the agriculture sector. Mobile phones in Tanzania are widely used for financial services, such as money transfers; however, the potential of cellular technology to benefit farmers through gender-responsive climate-smart extension services is not well explored, despite promising pilots, particularly around marketing platforms. For example, UNDP and the Economic and Social Research Foundation introduced the Mobile Kilimo ICT platform to link farmers and traders and in so doing enable farmers timely access to information on markets and prices. There are a number of SMS-based messaging platforms that allow farmers to receive key agricultural information on recommended agronomic practices for a particular crop, climate change and weather forecasts. Smartphones however can do more; in particular, they have the potential to provide visual instructions in local languages around best practices in gender-responsive climate-smart agriculture, and in so doing act as a “virtual” farmer field school.

It is therefore proposed to establish a pilot “virtual” farmer field school Youtube channel, based upon scaling up the Mobile Kilimo platform to encompass other components of agricultural extension and information services. This “e-agriculture” platform will see key crops having their production process broken down into the stages of the production cycle. For each stage, a model farmer will be identified and a short, 3 – 4 minute Youtube video will be shot in Swahili on a smartphone in which the farmer describes the best way of carrying out that stage of the production cycle. Thus, for key crops, 10 – 12 short videos will be made, which will incorporate gender-responsive climate-smart best practice in on-farm operations. Each video can be edited for presentation. This activity could be integrated into a broader coverage of the activities of Mobile Kilimo across Tanzania.

iii. Improve women's access to land to improve agricultural productivity

Tanzanian law offers scope to engender land tenure arrangements, through the procedures that can be used for the formalization of customary land rights. Under the Village Lands Act village lands held through customary rights of occupancy may be apportioned through the Mkurabita programme to individuals or groups through Certificates of Customary Rights of Occupancy (CCROs), which effectively formalizes their rights to that land. As the example of the Amani women's group shows, the assignation of group rights to land can have a powerful impact on gender equality, when embedded within a network with high levels of social capital. The CCRO provides the basis by which group rights to land can be formally assigned to women's groups. In this light, there is a need to scale-up the Mkurabita programme that allocates CCROs across the country.

At the level of individual households, this process needs to see government work with district land boards and non-governmental and civil society stakeholders to register the operation of customary lands by households and, critically, not only ensure that both men and women have their names on the CCROs but that both men and women receive copies of the CCROs when land is assigned to

households. In addition, mechanisms need to be put in place to ensure that the law granting spouses joint ownership is enforced. This will ensure that claims of joint ownership can be substantiated and rights associated with this ownership properly exercised. This will enhance not only the legal position of women, at the very least, but also women's knowledge of their legal position; it will also place women in a stronger position to assert control of customary land when their husband dies. Finally, having one's name on land documentation is associated with significantly stronger decision-making over land and, in other contexts, reductions in gender-based violence.

iv. Value addition to agriculture products produced by women

Women may benefit from agricultural production at different stages of the value chain than men. For example, selling maize as feed, cotton by-products, or animals for different reasons than men. It is therefore necessary to undertake a comprehensive gender-responsive value chain analysis of specific products and activities in different regions to determine the point in the agricultural value chain where women engage and benefit the most. Consistent with value addition by women is the need for policies designed to reduce post-harvest losses, which impose significant constraints on women and men farmers and their capacity to realize the full potential of their production. Together, these can provide the basis of the development of policies that generate benefits for both men and women. Beyond the farm level, the Small Industries Development Organization has a key role to play in improving women's capacities to move into the processing of agricultural products, particularly when women come together as a self-help group. So too do village community banks and rural savings and credit cooperative societies, although they are in need of great resources and training in financial literacy. This capacity-building should be predicated on extracting value out of indigenous knowledge, such as the drying of food, the processing of dairy products and the use of solar energy, all of which takes place on Masai land. The Tanzania Gender Networking Programme also has a role to play; their annual Gender Festival facilitates women processors of agricultural products to display their packaging and marketing, as well as their quality management, so that agricultural products processed by women can be identified in the market and can also be improved. In so doing, the Gender Festival provides a platform for women's economic empowerment.

v. Revisions to statistical instruments covering agriculture

Tanzania's evidentiary base is managed and coordinated on the mainland by the National Bureau of Statistics. The Bureau's activities produce data on the basis of nationwide representative surveys, including the National Panel Survey, the Household Budget Survey, the Integrated Labour Force Survey, the Agricultural Sample Census, and the Tanzania Service Provision Assessment. However, Tanzania's existing statistical instruments do not adequately capture gender relations. This was strongly evident in the field work, in that the impact of unpaid contributing female family labour working on male-controlled plots of farm land or on land where husbands controlled crop disposal decisions and the cash incomes that such disposal generates was probably undercounted in successive National Panel Surveys because the principal respondent to the survey was male.

The key revision to Tanzania's statistical instruments needs to be the use of both senior males and senior females in households as principal respondents to survey instruments. This implies having separate closed question interviews with both within the home and then triangulating the results. Related to this revision, a key objective should be to develop poverty measures that do not operate at the level of the household but which operate at the level of the individual, because household-level poverty measures assume a sharing of poverty risks, and that assumption may not be justified.

There is already extensive donor support for revisions to Tanzania's statistical system. Moreover, such

revisions are also consistent with more global trends in identifying the shortcomings of Living Standards Measurement Surveys and labour force surveys, and introducing revisions designed to enhance the statistical reliability of such surveys, particularly around gender relations.⁸⁶ In particular, the Evidence and Data for Global Equality project, a joint venture by the UN Statistics Division and UN Women, is seeking to ensure the gender-sensitivity of data by improving its gender-disaggregation and its gender-responsiveness, particularly as regards assets, which has implications for the understanding of growth dynamics and their relationship to poverty reduction strategies.

2. Policies to transform the social norms and values that can boost productivity

i. Policies to transform gender stereotypes and reap economies of scale

Tanzania's institutional and policy framework includes it being a party to the 1995 Beijing Platform for Action, which proclaimed that “shared power and responsibility should be established between women and men at home, in the workplace and in the wider national and international communities,” that resources and responsibilities in the household should be shared, that education is equally important for girls and boys, and that women should be able to work outside the household.⁸⁷ Since 1995 Tanzania has made institutional, policy and social progress towards realizing the aspirations of the Platform for Action, but that progress has not been nearly as extensive as it might – or should – have been. This is despite the fact that research in Tanzania that is more than two decades old has shown that improving cooperation between husbands and wives in agriculture can exert large positive impacts on total household income while at the same time improving the productivity of both labour and capital.⁸⁸ As a result, it can be argued that development programs that promote intra-household cooperation could lead to greater gains in productivity and incomes in Tanzania.

The fieldwork provided a counter-factual to the finding that intra-household cooperation in Tanzania can improve productivity and incomes by demonstrating the implications of a lack of cooperation. The field work found that gender-based violence, which is an indicator of a lack of cooperation, contributed to gender gaps in agricultural productivity. This fits with the emerging advocacy and academic literature in which gender-based violence is approached not just as a violation of civil and political rights but also as a violation of economic and social rights.⁸⁹ Moreover, as was illustrated in the field work, the violation of economic rights can be demonstrated to have micro- and macro-economic consequences.⁹⁰ Gender-based violence is rooted in socially-constructed norms and expectations around individual behaviour, and the fact that such norms and expectations typically perpetuate stereotypes that can be significantly divorced from the lived realities that women and men face. The need to confront stereotypes has two policy dimensions.

a. Developing policies that encourage husbands to be partners with their wives can improve agricultural productivity

Men themselves need to confront stereotypical masculine behaviour in order to change it. There is therefore a need to identify, promote and facilitate male advocates of gender equality at the local,

86 Available: <http://ftp.iza.org/dp4733.pdf> (accessed on 4 October 2017).

87 Available: <http://www.pewglobal.org/2010/07/01/gender-equality/> (accessed on 12 October 2017).

88 <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1477-9552.1994.tb00378.x> (accessed on 3 April 2018). Tibaijuka found that greater cooperation would improve labour productivity by 15 per cent, capital productivity by 44 per cent, and household cash incomes by 10 per cent.

89 Available: <http://www.unwomen.org/en/news/stories/2016/9/speech-by-lakshmi-puri-on-economic-costs-of-violence-against-women> (accessed on 4 October 2017).

90 Available: <https://www.cdc.gov/violenceprevention/pdf/ipvbook-a.pdf> (accessed on 4 October 2017).

regional and national level. As the success of UN Women's global #HeForShe campaign demonstrates, policies that support engaging with men around gender stereotypes can be an important means of confronting corrosive dimensions of masculinity, commencing an educational process that facilitates a recognition among men of the importance that they be involved in a range of farm and household work conventionally expected to be performed by women. In so doing, such policies can not only improve the lives of women and men but can contribute to improvements in agricultural productivity by fostering the emergence of economies of scale in farming.

b. Policies that support women's self-help groups can improve agricultural productivity

The International Fund for Agricultural Development has produced research from Asia on the importance of women's self-help groups in transcending local forms of gender discrimination, which not only enhances women's agency but can also improve women's access to the assets and inputs needed to improve agricultural productivity.⁹¹ Women's self-help groups empower women to make collective claims for the critical resources that they may be lacking to improve their farm production, facilitate the learning of new abilities and skills, allow women to develop gender-appropriate solutions to agricultural challenges, enhance women's bargaining power within households, communities and markets, and provide women with the space in which they can express their voice. The Amani women's group provided evidence from the field of all of these benefits. In so doing, women's self-help groups can offer a first opportunity to have a role in community decision-making.⁹²

Women's self-help groups need to be facilitated by Government and development partners at the village level to come together to privately and collectively discuss and confront gender-based violence, while at the same time informing women of their civil and political rights, especially when it comes to household assets and incomes. Women's self-help groups can also transfer knowledge about their livelihood options, including CSA options, and enhance collective skill sets. During the field work in Ololosokwan village in Ngorongoro a “digital village” programme had brought women together to improve their livelihoods through the production and marketing of crafts, to great effect. However, in too many communities women's lack of capacity to express agency is a function of not knowing the choices that are available to them, as well as the use of intimate-partner violence to constrain choices when they are known. As Ololosokwan and the Amani women's group demonstrated, there is clear evidence that women's self-help groups can empower individuals to challenge gender-based violence and gender stereotypes by providing collective support for individual and collective interventions to improve their livelihoods, thus offering fallback position that individual women will not have.⁹³ Moreover, supporting women within communities can result in increased numbers of women being prepared to take leadership roles at the village level.

ii. Policies that reduce time poverty and in so doing allow more time to be spent in farming

Time poverty is the material consequence of social norms and values that result in women having inadequate amounts of time to work on their plots of land. Policies that facilitate the construction of public infrastructure can relieve time poverty from unpaid care and domestic work in two important domains: water and energy, where the field research indicates major constraints on women's time availability for farming their plots; it is not unreasonable to say that for many women the collection of water and fuel occupies a minimum of 3 to 4 hours of every day which, by reducing labour supply, impacts upon agricultural productivity. Moreover, such infrastructure is of benefit to all members of a

91 <https://www.ifad.org/documents/10180/61297bc5-2280-4381-96b9-330b33a382bb> (accessed on 3 April 2018).

92 <https://www.ifad.org/documents/10180/3006b7d0-f241-4b27-8972-9ea655181fd2> (accessed on 3 April 2018).

93 Available: <https://global.oup.com/academic/product/gender-and-green-governance-9780199569687?cc=ca&lang=en&> (accessed on 4 October 2017).

community, representing the “low hanging fruit” of development policy. Each is addressed in turn.

a. Rainwater harvesting

In Tanzania the Ministry of Water and Irrigation has principal responsibility for determining priorities in the development and management of the water sector, with strong implications for sanitation and hygiene (WASH). The policy framework is provided by the 2002 National Water Policy, which was implemented through the 2006 – 2015 National Water Sector Development Strategy. The WASH sector is a domain in which women have a unique presence, as service users for the home and as service providers in the home when the public provision of the service is absent. There are thus strong gender dimensions to the WASH sector, with implications for the allocation of unpaid care and domestic work, which in turn impacts upon agricultural productivity. The reason why public water infrastructure is still deficient in much of rural Tanzania, and thus requires women to act as service providers, is because improved water supplies can come with a high capital cost and ongoing running costs, and while their yield, in terms of water, is high, many improved water systems are suitable only when the water table is reasonably accessible or in urban areas.

There is however one source of improved water supply that does not fit this profile. Rainwater harvesting can use local, low cost materials to build storage jars and tanks. Moreover, the running cost of rainwater harvesting is low. The yield depends on the frequency of rainfall, and in this regard, Tanzania, with an average of 1100 mm of rain a year spread principally around two rainy seasons, has, in much of the country, an abundance of rainwater that is by and large not harvested.

There have been a number of individual projects designed to harvest rainwater in Tanzania to collect water for in-situ soil conservation, to provide conventional irrigation, for livestock,⁹⁴ to improve water and sanitation in schools, and for household consumption. Through support from an international non-governmental organization (INGO), Ereto Masaai Youth in Elerai expanded the rainwater harvesting collection system in order to reduce the time spent on water collection by building 30 storage tanks at selected public buildings, adding to the storage capacity already in existence from homestead-based system. The result was “a strong demand for more tanks within the community”.⁹⁵ In the Kilimanjaro region, UNDP has supported a local non-governmental organization (NGO) to construct micro-dams that collect water as it streams down hillsides. In one village the micro-dam can store up to 220,000 litres of rain water. The micro-dam is owned and maintained by women and men community members, and is used to irrigate farms. According to UNDP, the project has resulted in better nutrition and higher incomes.⁹⁶ In rural Rundugai, support from a small INGO was used to build small rooftop concrete and PVC catchment systems. The total cost of the labour and materials per catchment system was approximately TSH1,368,000 (€815).⁹⁷ In Ngara and Biharamulo, an INGO with support from district council departments has used civil society organizations to harvest rainwater to supply schools with clean water as a cost of €4500 per 50000 litre tank. The intervention significantly increased water supply coverage in the targeted wards. However, the INGO notes that “the initial cost makes this unlikely to be replicated by the communities or schools themselves without funding support from a donor.”⁹⁸

94 <http://www.taccire.suanet.ac.tz/xmlui/bitstream/handle/123456789/290/GOWING.pdf?sequence> (accessed on 5 April 2018).

95 <http://www.thekeshotrust.org/cms/wp-content/images/Final-Report-Kesho-Trust-Elerai-Water-Project.pdf> (accessed on 5 April 2018).

96 <http://www.undp.org/content/undp/en/home/ourwork/ourstories/water-harvesting-improves-lives-tanzanian-farmers.html> (accessed on 5 April 2018).

97 https://www.samsamwater.com/projects/41/data/Mission_Report_Rundugai_Tanzania_20091221_final.pdf (accessed on 5 April 2018).

98 https://www.concern.net/sites/default/files/resource/2011/03/best_practice_rainwater_harvesting_in_ngara_and_biharamulo.pdf

The last two examples demonstrate a key constraint to the wider adoption of rainwater harvesting in Tanzania: “equipment and material costs are high”.⁹⁹ At the same time, there are still water shortages during the dry season, there can be issues with water quality, and there is, in general, a lack of demonstration projects that show communities the benefits of rainwater harvesting. For this reason, rainwater harvesting and storage in Tanzania remains a significantly under-utilized resource. However, WaterAid has produced a Technical Brief on rainwater harvesting that, using a Ugandan example, demonstrates that the construction of a long-life low maintenance 1500L storage jar using locally-sourced materials and labour and shared among 5 households is TSH124,000, or US\$55 – a much lower cost intervention than that which has been tried before.¹⁰⁰ There are approximately 38 million rural Tanzanians,¹⁰¹ and 54 per cent of them do not have access to an improved water source.¹⁰² With an average rural household size of 5.0 members, this implies that 4.1 million rural households do not have access to an improved water source.

Therefore, it is proposed to introduce a Government project in rainwater harvesting that can be supported by multilateral and bilateral donors. While the precise modalities of the project remain to be developed, a starting point would be to thoroughly collect and capture best and most cost-effective practices from existing pilots, both within Tanzania and regionally, adapting the lessons that can be learned in order to scale-up interventions that can be demonstrated to be successful. This suggests that consideration should be given not only to manufactured water tanks, which are known to be costly, but also water tanks that can be constructed using local materials along the lines of that suggested by WaterAid, because such an activity would bring with it multiplier effects to the local economy. The emphasis of the project would be to start small, and at a relatively low cost, in order to evaluate the effectiveness of the intervention, possibly using a randomized control trial.

b. Solar stoves and cookers

In Tanzania the Ministry of Energy and Minerals has principal responsibility for determining priorities in the development and management of rural energy, which it administers through the Rural Energy Agency. The policy framework with special relevance to the rural sector is the Tanzania's National Energy Policy, released in 2015. This policy, which pays attention to the role of solar energy in Tanzanian energy consumption, has an implicit gender dimension. In terms of the use of firewood and charcoal for cooking, the rural energy sector is a domain in which women have a unique presence, as energy service providers in the home when the public provision of energy services is absent, as it most usually is in rural Tanzania. There are thus strong gender dimensions to the rural energy sector, with implications for the allocation of unpaid care and domestic work, which in turn impacts upon agricultural productivity.

There is however a key source of rural energy that directly offsets the impact of the use of firewood and charcoal in rural areas. In Tanzania an average of more than one-third of the day is bright and clear, and so the country has an abundance of sunshine that is not utilized by rural households as an energy source. Conventionally, the use of sunshine as an energy source can be operationalized through the use of solar panels; however, the cost of solar panels would make a universal rural programme

(accessed on 5 April 2018).

99

https://www.researchgate.net/profile/Tulinave_Mwamila/publication/308033150_Strategy_to_Overcome_Barriers_of_Rainwater_Harvesting_Case_Study_Tanzania/links/57d7cd3d08ae601b39ae5fd5/Strategy-to-Overcome-Barriers-of-Rainwater-Harvesting-Case-Study-Tanzania.pdf (accessed on 5 April 2018).

100 Available: <http://www.wateraidamerica.org/sites/default/files/attachments/Rainwater%20harvesting.pdf> (accessed on 30 September 2017). The estimate in the brief has been increased to reflect Uganda's inflation and exchange rates between 2013 and 2017.

101 Available: <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS> (accessed on 16 October 2017).

102 Available: <https://data.worldbank.org/indicator/SH.H2O.SAFE.RU.ZS> (accessed on 16 October 2017).

prohibitively expensive. Alternatively, solar stoves and cookers can use local, low cost materials to construct simple, low-technology cooking stoves that rely on the sun. Moreover, the running cost of solar cooking stoves is negligible. The key limitations of solar cooking stoves are that their energy yield relies upon sunlight, that they perform optimally at mid-day, and that some foods take longer to prepare using solar cooking stoves. Although this suggests an increase in unpaid care and domestic work, this must be weighed against the reduction in the time devoted to firewood collection and the health benefits of using clean energy, both of which impact upon unpaid care and domestic work. Nonetheless, cumulatively there would need to be systematic community-based education in the use of solar cooking stoves.

In Tanzania there have been a number of interventions by INGOs, local NGOs and the private sector to provide solar stoves and cookers across the country. In total, more than 9000 solar stoves and cookers, of various designs, have been distributed.¹⁰³ However, these distributions have not been systematically evaluated. In the early 2000s the College of Engineering and Technology at the University of Dar Es Salaam conducted a numbers of studies on the development and performance of solar cookers.¹⁰⁴ The research found that the “results obtained indicate that many of the cookers could be used to cook food for households in areas with medium and high insolation”, and that while heating efficiency was an issue “the ‘SunStove’ box cooker was able to cook 2 kg of rice, which is sufficient for a moderately-sized family in Tanzania”.¹⁰⁵ Interestingly, later Oxford University researchers, in collaboration with Dar Es Salaam Institute of Technology, conducted intensive field trials a low cost newly-designed solar cooker in Dar Es Salaam and Dodoma in 2015. The research showed that the solar cooker had much superior heating efficiency when compared to the earlier 'SunStove' model, but it was not brought to market.¹⁰⁶ More recently, the Tanzania Solar Bakery Project in Kisarawe district aimed to help marginalized women by providing them with a commercial solar oven. Qualitative evaluations suggested that the solar oven had led to increased incomes, improved health, and enhanced social status for women that took part in the project.¹⁰⁷

It needs to be noted that there are a number of solar cookers and ovens for which the technical specifications can be accessed at no cost over the internet and for which the technical requirements are far less costly than some of those that have been piloted. For example, the SunStove box cooker uses PVC glazing. Much simpler, low cost low maintenance solar stoves and cookers that last approximately two years can be obtained for average price range of between US\$3 and US\$7. The median, US\$5, can produce a solar box oven.¹⁰⁸ Therefore, it is proposed to develop a project that would introduce solar box ovens into a number of villages in a number of districts. The starting point for the project would be to thoroughly collect and capture best and most cost-effective practices from existing pilots, both within Tanzania and regionally, adapting the lessons that can be learned in order to scale-up interventions that can be demonstrated to be successful. The emphasis of the project would be to start small, and at a relatively low cost, in order to evaluate the effectiveness of the intervention, possibly by using a randomized control trial. To the direct cost of supply solar box ovens during the pilot should also be added community training in the use of the solar box ovens.

103 <http://www.solarcookers.org/our-work/solar-cooker-distribution/> (accessed on 5 April 2018).

104 http://www.erc.uct.ac.za/sites/default/files/image_tool/images/119/jesa/18-3jesa-kimambo.pdf (accessed on 5 April 2018).

105 http://www.erc.uct.ac.za/sites/default/files/image_tool/images/119/jesa/18-3jesa-kimambo.pdf (accessed on 5 April 2018).

106 <http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.729930> (accessed on 5 April 2018).

107 https://regions20.org/wp-content/uploads/2017/07/Tanzania-Solar-Bakery-Case-Study_Edited-final-version_20-SEPT-2017.pdf (accessed on 5 April 2018).

108 Available: <http://solarcooking.wikia.com/wiki/CooKit> (accessed on 30 September 2017).

iii. Lack of cash and its implications for agricultural productivity

Since the introduction of Vision 2025, Tanzania has had a wide variety of rural programmes and projects designed to boost agricultural production, incomes and household welfare. In that these programmes and projects seek to support communities, households and individuals in their efforts to prevent, manage and overcome risks and vulnerabilities, they constitute social protection interventions. However, these interventions may require institutional capacity at the national or local government level that may not be present, which can often help explain disappointing programme and project performance. For example, the National Agricultural Input Voucher Scheme pilot project implemented with support from the World Bank was designed to be a “market-smart” subsidy targeted at providing small-scale farmers with access to critical agricultural inputs, such as fertilizers and improved seeds, particularly for maize and rice production, with a 50 per cent subsidy over a three-year period. In many ways an admirable pilot, the Scheme nonetheless required institutional capacities that were underdeveloped, and which thus compromised its results. At the same time, in common with many programmes and project, gender constraints were not addressed in implementation, which impacted upon its effectiveness. As a result, in the past 15 years it has become apparent to international development institutions that when poor people lack cash the most effective social protection intervention is to provide them with cash. While transfers from government to citizens in the form of cash preclude the targeting of social protection towards consumption or production, this apparent weakness is in fact a strength; poor people are themselves the best judges of how social protection expenditures can assist their efforts to prevent, manage and overcome risks and vulnerabilities. These cash payments from government to citizens can take the form of conditional cash transfers or unconditional cash transfers. Conditional cash transfers make a payment to a citizen when the citizen completes the performance of a pre-defined task, such as ensuring that children are in school or are immunized; unconditional cash transfers make a payment to a citizen without these constraints.

Claims that cash transfers are inefficient in their use of scarce government resources is not supported by the global comparative evidence, which in fact suggests that well-designed cash transfers can improve efficiency and equity.¹⁰⁹ This is also the case in the region: a three-year quasi-experimental evaluation of a cash transfer scheme in Zambia found that it produced a strong impact on livestock ownership, fertilizer use, cash crop production, and school enrolments.¹¹⁰ A four-year randomized control trial of unconditional cash transfers in Uganda found that they generated significant boosts to income, particularly among women, as resources were productively utilized to create assets, and that mismanagement was very limited.¹¹¹ A two-year randomized control trial of conditional cash transfers in Kenya found that they produced robust improvements in food consumption, reduced child labour, contributed to the accumulation of productive assets, and increased the formation of non-farm enterprises, particularly among women.¹¹² Finally, an evaluation of a cash transfer scheme in rural Malawi demonstrated strong increases in food consumption from own-production, the ownership of productive assets, and a significant decrease in casual labour.¹¹³

The Tanzania Social Action Fund (TASAF), introduced in the 2000s, is managed by the President's

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https://books.google.ca/books?hl=en&lr=&id=M2WWHizQON0C&oi=fnd&pg=PR7&dq=barrientos+cash+transfers+efficiency&ots=dER_bmiLia&sig=TYCpWHQGD19g0KemjLTaSMCh-fg#v=onepage&q=barrientos%20cash%20transfers%20efficiency&f=false (accessed on 3 April 2018).

110 <https://transfer.cpc.unc.edu/wp-content/uploads/2015/09/Zambia-Monze-Followup-Report.pdf> (accessed on 5 April 2018).

111 Available: https://www.poverty-action.org/sites/default/files/publications/If_you_give_the_poor_cash_does_it_help.pdf (accessed on 2 October 2017).

112 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4316733/> (accessed on 5 April 2018).

113 <https://onlinelibrary.wiley.com/doi/abs/10.1111/agec.12017> (accessed on 5 April 2018).

Office. While TASAF II at its height reached more than 16 million people,¹¹⁴ Tanzania has yet to agree on a comprehensive cash transfer framework; TASAF III has been implementing a nationwide Productive Social Safety Net Programme (PSSN) targeted at women on behalf of the household,¹¹⁵ but this is not universal, targeting those under the basic needs poverty line, or 1.1 million households, of which 51 per cent are female-headed.¹¹⁶ Nonetheless, there is deep support within Government for the development of comprehensive social protection programming in Tanzania, and the Government is in the process of developing a comprehensive and coordinated social protection policy; it can also be noted that there is extensive donor support for comprehensive social protection in Tanzania.

In this light, the PSSN programme should continue to be rolled out, especially in rural areas, in order to ease the constraint that a lack of cash can have on the choices that women must make. In particular, by rolling out the PSSN programme and easing the cash constraint women's need to undertake casual waged labour or petty trading will be reduced, thereby freeing up some time that can be allocated to their plots of land, and in so doing contributing to improvements in labour productivity by increasing labour inputs into women's farming.

3. Further research

Given the findings of this study, it would be useful to consider two further pieces of research:

1. re-estimate the gender gap in agricultural productivity in Tanzania using the 2014-15 National Panel Survey but explicitly incorporating into the analysis, to the extent possible, unpaid care and domestic work, unpaid contributing family farm labour and the economic consequences of gender-based violence, in order to properly capture key drivers of the gender gap established in the field work;
2. undertake quantitative research at the micro-level that would incorporate unpaid care and domestic work, unpaid contributing family farm labour and the economic consequences of gender-based violence into estimates of the gender gap in agricultural productivity.

114 <http://siteresources.worldbank.org/EXTUNITFESSD/Resources/1633787-1322594494226/TASAF-PROJECT-PROGRAMDAR-ES-SALAAM.pdf> (accessed on 3 April 2018).

115 Government Project Preparation Team (2013). 'Third Social Action Fund: Productive Social Safety Net (PSSN) Operational Manual.' Available from the UNDP Tanzania Country Office.

116 TASAF Management Unit (2017) 'Tanzania Social Action Fund – Productive Social Safety Net: Third Quarter Progress Implementation Report (January – March 2017)'. Available from the UNDP Tanzania Country Office.

VI. Conclusion

'The Cost of the Gender Gap in Agricultural Productivity in Malawi, Tanzania and Uganda' Report in 2015 found that in Tanzania women plot managers had lesser productivity than male plot managers because of a lack of male family labour to work on women's plots and because men have better agricultural technologies than women, namely pesticides and agricultural implements and technologies. The results of the qualitative research that underpins this study confirms these findings, but in ways that dig deeper into the processes behind the statistics, in order to identify the key drivers of the cost of the gender gap in agricultural productivity in Tanzania. In Tanzania social norms and values, reinforced by gender-based violence, were seen to produce time poverty for women in the villages across the country where the research was conducted. Thus, it was not just a lack of male family labour that was responsible for lower productivity, as was found in the 2015 Report and in this study; it was more generally a lack of women's labour to work on their own plots of land because of other socially-defined responsibilities. At the same time, women have the responsibility to provide food and cash to meet household maintenance needs. This also reduces labour inputs into farm production, while cash that is generated is not used to enhance farm productivity. Cumulatively, these result in women having less time or money to use on their farm plots.

In rural Tanzania labour, along with land, are key inputs in farm production and farm productivity. With women having less time and money to use on their plots, women's farm inputs into production are lower than those of men, and so their farm crop productivity can be expected to be lower than that of men. This is then compounded by a lack of gender-responsive climate-smart agricultural extension services, the lack of provision of which constrains the capacity of women and men farms to accommodate the impact of a changing climate on their farming.

This suggests that policy recommendations that are designed to alter the terms and conditions by which women operate in input and product markets may have a limited impact on their agricultural productivity, because such recommendations would not get at the underlying forces that result in lesser agricultural productivity. Therefore, this study has identified a number of policy proposals designed to confront the gender stereotypes that continue to undermine policy-making, address women's time poverty, women's lack of assets and incomes, the more general rural problem of a lack of attention to gender-responsive climate-smart agricultural extension services, as well as the need to reform key statistical instruments in order to better capture gender relations.

To reiterate these policy proposals:

- to identify male champions of gender equality that can demonstrate the improvements to livelihoods that can come about when husbands and wives cooperate;
- to facilitate the development of women's self-help groups, to collectively advocate for improved access to the assets and incomes need to increase productivity;
- to introduce and scale-up a Government pilot project in rainwater harvesting;
- to develop and scale-up a Government pilot project that introduces solar stoves;
- to roll out across the country the Productive Social Safety Net programme, in order to ease the cash constraints that push women into casual waged labour and petty trading, and thereby freeing up labour to be used on farm plots;
- to expand the coverage of the introduction of training in gender-responsive agricultural extension services;
- scale up the Government's Mkurabita project that introduces certificates of customary rights of occupancy over the use, but not ownership, of land, titled in the name of both wife and husband;
- develop a small-scale project to rapidly identify the most promising agricultural value chains in Tanzania where women feature prominently;
- undertake revisions to Tanzania's key statistical instruments in order to enhance their gender-responsiveness; and
- undertake further quantitative research into the gender gap in agricultural productivity in Tanzania.

VII. References

- Aguilar, A., E. Carranza, M. Goldstein, T. Kilic, and G. Oseni. 2015. "Decomposition of Gender Differentials in Agricultural Productivity in Ethiopia." *Agricultural Economics* 46.3: 311–34.
- Ali, D. A., D. Bowen, K. Deininger, and M. F. Duponchel. 2015. "Investigating the Gender Gap in Agricultural Productivity: Evidence from Uganda." Policy Research *Working Paper* 7262, World Bank, Washington, DC.
- Backiny-Yetna, P., and K. McGee. 2015. "Gender Differentials in Agricultural Productivity in Niger." Policy Research *Working Paper* 7199, World Bank, Washington, DC.
- Bernstein, H. 2010. *Class Dynamics of Agrarian Change*, Halifax and Winnipeg: Fernwood Publishing,
- Dorosh, P., and J. Thurlow. 2014. "Beyond Agriculture versus Nonagriculture: Decomposing Sectoral Growth–Poverty Linkages in Five African Countries." IFPRI *Discussion Paper* 1391, International Food Policy Research Institute, Washington, DC.
- Kilic, T., A. Palacios-Lopez, and M. Goldstein. 2015. "Caught in a Productivity Trap: A Distributional Perspective on Gender Differences in Malawian Agriculture." *World Development* 70: 416–63.
- Oseni, G., P. Corral, M. Goldstein, and P. Winters. 2015. "Explaining Gender Differentials in Agricultural Production in Nigeria." *Agricultural Economics* 46.3: 285–310.
- Slavchevska, V. 2015. "Gender Differences in Agricultural Productivity: The Case of Tanzania." *Agricultural Economics* 46.3: 335–55.