

FACTORS DRIVING

the Gender Gap

IN AGRICULTURAL PRODUCTIVITY: TANZANIA



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This report is a joint product of UN Women Regional Office for Eastern and Southern Africa (ESARO) and the United Nations Development Programme–United Nations Environment Programme Poverty-Environment Initiative (UNDP–UN Environment PEI) Africa.

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Acknowledgements

The United Nations Entity for Gender Equality and Empowerment of Women (UN Women), in partnership with the Poverty-Environment Initiative (PEI) of the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UN Environment) commissioned this study, *Factors Driving the Gender Gap in Agricultural Productivity in Tanzania*.

UNDP–UN Environment PEI and UN Women in Tanzania and the Eastern and Southern Africa Regional Office (ESARO) in Kenya would like to express their gratitude to the Government of Tanzania through the Ministry of Agriculture. Sincere appreciation goes to Jofrey Oleke, Monitoring and Evaluation Officer, and Nkuvililwa Simkanga, Director of Policy and Planning (in the then–Ministry of Agriculture, Livestock and Fisheries) for their consistent and valuable contributions of relevant information throughout the process of the study. Further appreciation goes to the local government authorities of the regions and districts in which the research took place; specifically, the Ikungi district in the Singida region, the Bunda district in the Mara region, the Kibondo district in the Kigoma region, and the Ngorongoro district in the Arusha region. We particularly commend Lilian Edward Mbunito, Ngorongoro Community Development Officer; Hadija Mtambi Said, Bunda Community Development Officer; Ayub Sengo, Ikungi District Agricultural Irrigation and Cooperative Officer; and Victor

Kabunga, Kibondo District Agricultural Irrigation and Cooperative Officer for their invaluable contribution to the success of the field consultations.

We would like to acknowledge the efforts of Haroon Akram-Lodhi, Professor of Economics and International Development Studies at Trent University, and Immakulata Menas Komba, Director, Ecosystem on Land Consult Ltd, in conducting the study. We would also like to acknowledge Will Stolzenburg and Mark Bernstein, who edited the report, and Nita Congress, who designed the publication.

We are grateful to all the participants of the validation workshop held 18 October 2017. The invaluable inputs of these representatives of governmental organizations, UN agencies, civil society organizations and researchers led to refinement of the document.

Finally, special appreciation goes to the staff members who provided strategic guidance and substantive inputs for production and publication of the final document, notably Ambrose Mugisha, Jacinta Okwaro, Kristina Weibel and Moa Westman, UNDP–UN Environment PEI; Maria Karadenizli and Mehjabeen Alarakhia, UN Women Tanzania; and Fatmata Sesay-Kebbay, UN Women ESARO.

Executive summary

Agriculture is at the core of both the Tanzanian economy and Tanzanian society. The sector employs 67 per cent of the nation's workers and accounts for about 23 per cent of the country's gross domestic product. Agriculture is the source of key exports such as coffee, cotton, cashew nuts and tea. To ensure the country's continued growth and meet the challenge of reducing rural poverty, the agricultural sector can and must make a greater contribution to the nation's economy. At present, only 27 per cent of Tanzania's 44 million hectares of arable land is under cultivation. Irrigation is rare, so most crops depend on rainwater. Further, short-sighted land management practices undercut the fertility of some cultivated lands. As to the people who work this land, many survive on extremely limited means. Of the 12 million Tanzanians who live in poverty, 10 million are rural dwellers, individuals whose incomes are less than \$1.90 a day.

Clearly, the well-being of Tanzanian farmers and of the country generally is strongly dependent on improving the productivity of its agricultural sector. For this to occur, however, this sector and the influences on its outcomes need to be thoroughly understood.

At first glance, Tanzania presents a picture of small-scale agriculture. A more disciplined look, however, reveals that it is in fact a heavily gendered society, one in which a host of factors combine to reduce the productivity

of the nation's women farmers — and thereby thwart efforts to raise the country's general standard of living. This gender gap was affirmed by a joint investigation by the United Nations and the World Bank, which in 2015 produced the report *The Cost of the Gender Gap in Agricultural Productivity in Malawi, Tanzania, and Uganda*. The report provided quantitative evidence of the links between agricultural productivity, economic growth and gender inequalities; and estimated the costs of growth opportunities lost to gender inequalities in agriculture in the three countries.

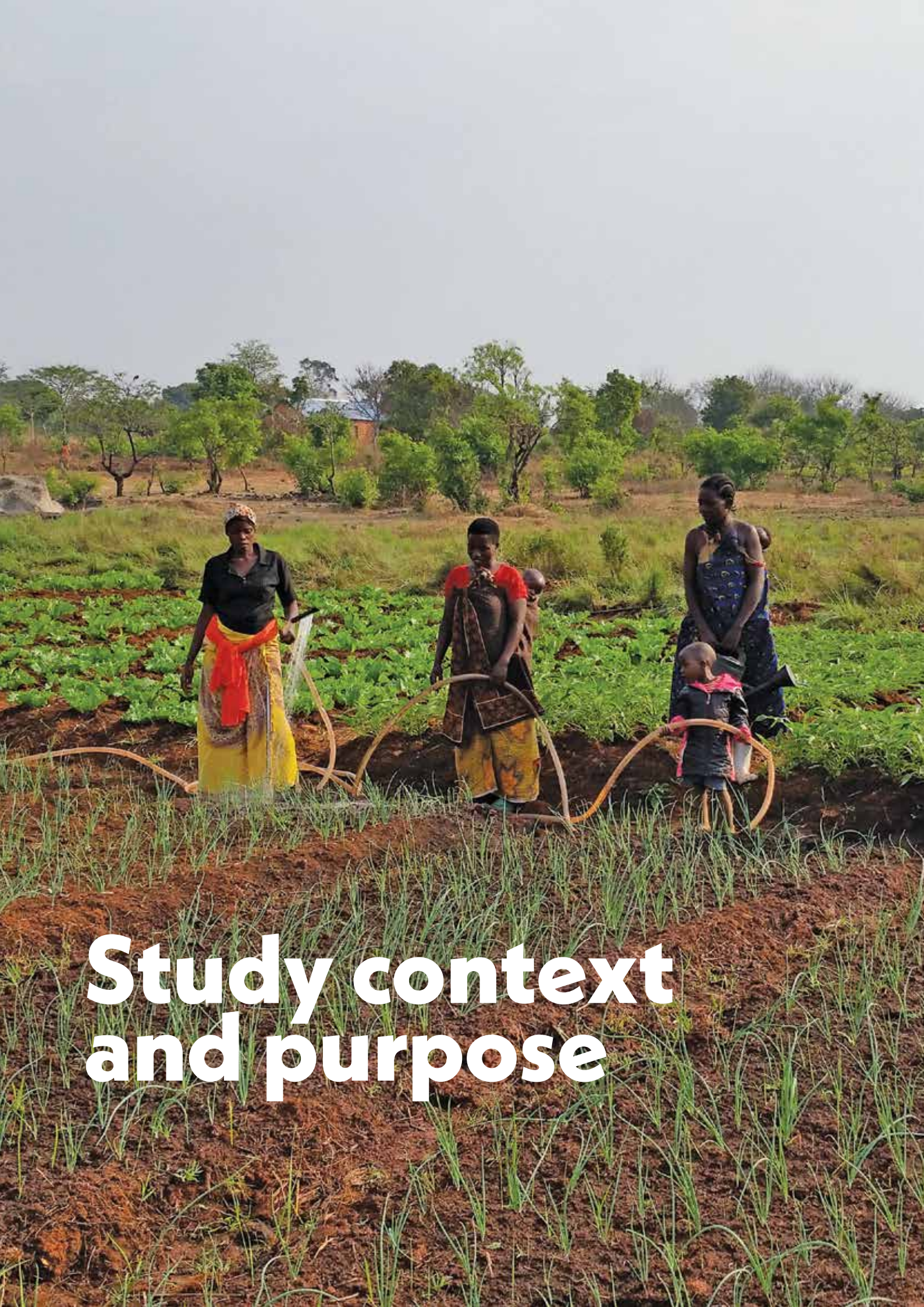
For Tanzania, the gender gap was substantial: an elimination of the gender gap in agricultural productivity in Tanzania would increase agricultural production by 30 per cent. Closing the gap could raise the country's gross domestic product by \$105 million (T Sh 210 billion) and lift 80,000 people out of poverty each year over a 10-year period.

This study differs from its predecessor in that it takes a qualitative rather than quantitative approach to the subject. In its attempt to find underlying causes of the gender gap, the study conducted extensive interviews with 547 women and men in 19 farming villages in rural Tanzania. That is, it moves beyond merely establishing that a gender gap exists in Tanzanian agriculture to explain *why* it exists and what steps can be taken to reduce and eliminate this gap.

This study found that the gender gap in Tanzanian agriculture stems from the following:

- Tanzanian women devote many more hours to maintaining the home; gathering firewood; fetching water; and caring for the young, the ailing and the aging. Not only are these tasks uncompensated, but they significantly reduce the time women have available to cultivate their own crops. This “time poverty” is further exacerbated by the cultural expectation that women will labour on plots owned by their husbands before working on their own.
 - Tanzanian women are expected to provide cash to meet household needs. This commonly prompts them to seek outside employment, which is generally less well paid than that available to men and which further reduces the time available to work their own plots of land.
 - The lower incomes characteristic of Tanzania’s women farmers make it more difficult for them to take advantage of commercial fertilizers, improved seeds, pesticides or better tools that could be employed to boost their productivity.
 - Tanzanian women are commonly the victims of gender-based violence that, among other things, maintains male prerogatives related to the sale of cash crops and control over the money thereby derived.
- Identify male champions of gender equality who can demonstrate the power of husband-wife cooperation to improve livelihoods.
 - Facilitate women’s self-help groups to collectively advocate for the assets and incomes needed to produce better crops.
 - Introduce scalable government pilot projects to harvest rainwater and provide solar cookers.
 - Roll out Tanzania’s Productive Social Safety Net programme to ease the cash limitations that push women into casual waged labour and petty trading, thereby freeing their labour for farming.
 - Expand training of women farmers and of agricultural extension officers in providing gender-responsive and climate-smart agricultural services.
 - Scale up the government’s Mkurabita project which allocates certificates of customary rights of land occupancy to both the wife and the husband when land is assigned to households.
 - Develop a small-scale project to rapidly identify the most promising agricultural value chains where Tanzanian women feature prominently.
 - Revise Tanzania’s key statistical instruments to reflect gender considerations.
 - Undertake further quantitative research into the gender gap in agricultural productivity in Tanzania.

The gender gap is substantial, and closing it will increase economic growth and food security and foster poverty reduction. To that end, this report points to concrete steps that can be taken to realize what can be done for the betterment of Tanzania’s citizens. In brief, these policy proposals are as follows:



Study context and purpose

Agriculture is at the core of both the Tanzanian economy and Tanzanian society. The sector accounts for about 67 per cent of employment, about 23 percent of gross domestic product (GDP), 30 percent of exports and 65 percent of inputs to the industrial sector (Ministry of Finance and Planning, 2016). Agriculture is the source of key exports such as coffee, cotton, cashew nuts and tea. Overall, the Tanzanian economy is expanding, with per capita income rising from \$870 (T Sh 1.4 million) in 2012 to \$926 (T Sh 2.0 million) in 2016 — despite a higher than average population growth over the period, which partially offset GDP growth of more than 6 per cent per year during those years (World Bank, 2017).¹

Growth in the agricultural sector is not keeping pace with these overall positive economic

trends, with annual average growth of about 2.8 per cent over the 2012–2016 period (World Bank, 2017). The challenges to growth in the sector are myriad. Regarding the land itself, only 27 per cent of the 44 million hectares of the country’s arable land is under cultivation. Irrigation

is rare, so most crops depend on rainwater. Short-sighted land management practices undercut the fertility of some cultivated lands, and little is being systematically done to counter the encroaching impacts of climate change. Regarding those who work this land, many survive on extremely limited means. Of the 12 million Tanzanians who live in poverty, 10 million are rural dwellers (World Bank, 2017), individuals whose incomes are less than \$1.90 a day (purchasing power parity-adjusted 2010 dollars).

Pervasive rural poverty is a compelling argument for improving the productivity of Tanzania’s agricultural sector. Improvements in

standards of living are most strongly driven by increases in productivity. In economic terms, productivity is the relationship of inputs to outputs — or, stated more casually, how much does it take to produce how much? 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 (GSARS, 2017). In the agricultural sector, the key inputs are land and the time of those who till it. Productivity may be measured either in terms of crop yield relative to cultivated land — say, yield per hectare — or crop yield relative to hours devoted to farming. However measured, productivity is key. The World Bank noted in its 2015 Tanzania Mainland Poverty Assessment report that “for every 10 percent increase in growth per person, poverty can be expected to be reduced by 10.2 percent” (World Bank, 2015)

Given the importance of rising productivity as a driver of general economic improvement, it is discouraging that, according to World Bank data, the value added per worker in rural Tanzania has remained essentially stagnant since 2010.² This stagnation has effects beyond locking individuals and families into their existing low levels of economic well-being. It also prompts individuals to over-exploit their environmental resources, further perpetuating disappointing productivity in farming — which in turn can affect other rural subsectors such as forests and fisheries. The impact of soil degradation on crop production reinforces the negative consequences of a changing climate for Tanzania’s farmers.

For the rural economy to contribute more fully to Tanzania’s growth and modernization, efforts must focus on improving the situation, prospects and production of Tanzania’s women farmers, who conduct 80 per cent of Tanzania’s farm work (USAID, n.d.). Given the disproportionate engagement of women in

the sector, Tanzania's rural economy is clearly a gendered one, with important implications for the country's economic growth and its alleviation of poverty.

The gender gap in agricultural productivity in Tanzania

In Tanzania's gendered society, agricultural productivity is not equitably shared between male and female farmers, thus thwarting the country's economic growth and exacerbating its poverty. This recognition was an important rationale for a joint investigation by the United Nations and the World Bank, which in 2015 produced the report *The Cost of the Gender Gap in Agricultural Productivity in Malawi, Tanzania, and Uganda* (UN Women, UNDP-UNEP PEI and World Bank, 2015; hereafter referred to as the 2015 report). The report provided quantitative evidence of the links between agricultural productivity, economic growth and gender inequalities. It assigned dollar values to the gender inequalities in agricultural productivity, thus providing a simple

metric by which to gauge the importance of the gender gap. Not accounting for any differences in the quality and quantity of land farmed by men and women respectively, the report assessed the "unconditional gender gap" in agricultural productivity in Tanzania at 16 per cent. As shown in Figure 1, eliminating this gap would produce an increase of:

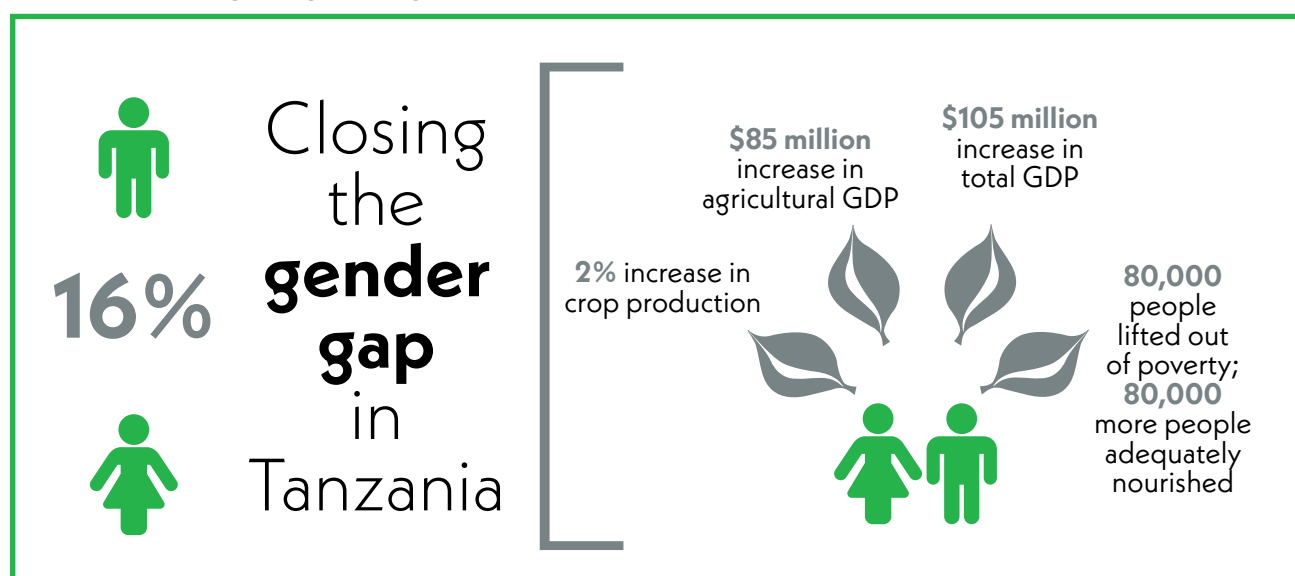
- 2.1 per cent of current crop output
- 1.5 per cent of agricultural GDP; or about \$85 million (T Sh 169 billion)
- 0.46 per cent of total GDP; or about \$101 million (T Sh 201 billion), with multiplier effects included³

When differences in land quantities and qualities are taken into account, the *conditional* gender gap is much larger: 30 per cent. Eliminating this gap would produce an increase of:

- 3.9 per cent in current crop production
- 2.7 per cent in agricultural GDP; or about \$105 million (T Sh 209 billion)

FIGURE 1

Results of closing the gender gap in Tanzania



SOURCE: Adapted from UN Women, UNDP-UNEP PEI and World Bank, 2015.

- 0.9 per cent in total GDP; or about \$196 million (T Sh 390 billion)

Combining the gross gains in GDP with the poverty-growth elasticities reported by Dorosh and Thurlow (2014) show that closing the agricultural gender gap would lead to a reduction of 0.42 per cent in head count poverty. Restated, this would be sufficient to move 80,000 people a year out of poverty every year over a 10-year period.

The Oaxaca-Blinder decomposition approach (Fortin, Lemieux and Firpo, 2010) was used

to determine the shares of the gender gap attributable to women and men farmers having different levels of agricultural inputs and women receiving a lower return from similar inputs.⁴ The first finding was that women farmers received much less male family labour to till their plots; indeed, this generated 97.3 per cent of the gender gap in agricultural

productivity in Tanzania. If this gender gap was eliminated, GDP could rise by as much as \$102 million (T Sh 203 billion). The second finding was that women characteristically used lower volumes of fertilizers and pesticides. Eliminating the gender gap here could raise GDP by \$19.3 million (T Sh 38 billion). A third finding was that women's lower level of access to improved agricultural tools accounts for 8 per cent of the gender gap.

Women are more likely than men to be employed as casual farm labour, for which they are paid only one-third of what men receive.

micronutrient deficiencies, both of which affect more women than men. Tanzania's rural poverty is gendered because, in agriculture, women typically make do with less than their male counterparts. Seventy-three per cent of small farms in Tanzania are held by men. In contrast, women's farms are smaller, have fewer plots, are less likely to be irrigated and employ less labour than farms managed by a man (Osorio, Percic and Di Battista, 2014; MoHCDGEC et al., 2016). Male farmers are also more likely than their female counterparts to use improved seeds (Osorio, Percic and Di Battista, 2014).

Women farmers are particularly disadvantaged by the lack of agricultural extension services available to them, a problem stemming in part from the fact that the extension officers are predominantly men who often do not recognize the unique and specific constraints facing women plot operators (TGNP, 2017; United Republic of Tanzania, 2016). Women are more likely than men to be employed as casual farm labour, for which they are paid only one-third of what men receive for such work (Osorio, Percic and Di Battista, 2014). Further, such income earned by women is more likely to be spent on household needs than that earned by men.

Women also have a harder time securing investment capital. For example, although the Tanzania Agriculture Development Bank was established to provide low-interest loans to guarantee food security and aid in the transition from subsistence to commercial farming (Ministry of Agriculture Food Security and Cooperatives, 2014), few women possess the formal land title required to obtain such loans.

Gender challenges in rural Tanzania

Farming and poverty

As noted, the poor of Tanzania are largely rural poor. Rural poverty is the substantive cause of chronic malnutrition and

Gender and climate change

Social norms are not the only factor that influence gender distinctions in Tanzanian agriculture. All Tanzanian farmers are affected by climate change and associated natural

disasters. Drought forces men to travel further to find pasture for their livestock. Drought forces women to travel further to obtain water and firewood, thus reducing the time they can apply to tilling their plots.

Nonetheless, men — with their knowledge, ownership of land and control of farming resources — have an advantage over their female counterparts when it comes to climate change (UMFULA, n.d.). Because women manage more fragile lands, their plots are more vulnerable to floods, landslides, drought and the impoverishment of soils that ensues. With their lower cash incomes, women cannot afford the technologies that might otherwise compensate for their deficient soils.

Coping and adaptation strategies can also be gendered. Climate change may prompt farmers to move from traditional cash crops such as tobacco towards more drought-resistant, early maturing food crops — such as cassava, beans and maize — that can be sold at market. However, this reorientation can contribute to food insecurity, as the cash earned from these “flexible” crops is generally expended according to men’s wishes.

Government institutions and gender policy

Tanzania has long-standing commitments to human rights, having made impressive improvements in female enrollment in primary school⁵ and representation in parliament (IRI, 2015). Nonetheless, 42 per cent of women in Tanzania experience intimate-partner violence during their life; in 2015, 30 per cent reported experiencing such violence within the past 12 months.⁶ Young Tanzanian women have little access to reproductive health services, resulting in high incidences of early marriage, pregnancy and lethal diseases, and low rates of secondary school completion. Sixty per cent of Tanzanians living with HIV/AIDS are female. Finally, women comprise only 10 per

cent of the political leadership at the district level or below (USAID, n.d.). These and related factors explain Tanzania’s relatively low ranking in the gender equality indices of the Organisation for Economic Co-operation and Development and the United Nations Development Programme (USAID, n.d.; MoHCDGEC et al., 2016).

The country’s 1977 Constitution contains the juridical foundation of gender equality in Tanzania, seeking to build “a nation of 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 towards ensuring” this outcome.⁷ Moreover, women are constitutionally entitled to the same rights to land as men. The Tanzanian government has committed to gender equality through its ratification of a series of key international conventions and policy instruments and laws which provide the legal basis for improving women’s equality.

Vision 2025 is Tanzania’s overarching national policy framework, seeking to guide its transition from a least developed country to a middle-income country by the year 2025 (United Republic of Tanzania, n.d.). Vision 2025 is anchored in the country’s Long Term Perspective Plan 2011/12–2025/26, which is being implemented through five-year development plans. Tanzania’s second Five Year Development Plan 2016/17–2020/21 is built on three pillars: transformation, industrialization and implementation effectiveness (President’s Office, Planning Commission, 2012). While the plan recognizes the lower yields of women’s farms, gender remains only weakly integrated into its objectives (Ministry of Finance and Planning, 2016).

Because women manage more fragile lands, their plots are more vulnerable to floods, landslides, drought and resulting degraded soil.

Key documents guiding the integration of gender equality into all policies, plans and programmes include the Women and Gender Development Policy of 2000, the National Strategy for Gender and Development of 2005, and the 2016 National Plan of Action to End Violence against Women and Children in Tanzania. In the agricultural sector, the 2013 National Agriculture Policy and the 2016 Agricultural Sector Development Programme Phase II recognize that women are the majority of the labour force in the country's agriculture sector and are in need of assistance in bridging gender gaps. Women have been targeted by the 2015–2025 Tanzania Climate Smart Agricultural Programme, which promotes climate-resilient agricultural techniques to ensure the resilience of crops and livelihoods (Ministry of Agriculture Food Security and Cooperatives, 2013; United Republic of Tanzania, 2016). Thus the legal and policy landscape for Tanzania's farming women is progressive, although results on the ground remain disappointing.

Purpose and scope of this study

This study aims to better and more deeply understand the gender gap in Tanzanian agriculture. It builds on the 2015 report, presenting an in-depth qualitative analysis of what drives the gender gap in Tanzanian agricultural productivity. Both primary data,

collected through stakeholder consultations and interviews at the community and household levels, and secondary data are used, as detailed in the next section. Specifically, this study:

- Explores factors underpinning the gender gap not highlighted in the 2015 report
- Seeks a better understanding of how each factor might be addressed in policy and programming
- Deepens understanding of women's and men's vulnerability to climatic variations and environmental degradation
- Explores how gender gaps in agriculture might influence unsustainable agricultural practices, environmental degradation and poverty
- Provides recommendations on the most cost-effective solutions to closing gender gaps in agricultural productivity through climate-smart agricultural practices



Analytic framework and methodology

Conventional approaches to analysing gender gaps in agriculture — and that used by the 2015 report — assess differences between women and men regarding factors of production (land, labour, seeds, fertilizers, pesticides, tools, etc.), farming practices, the impacts of climate change and mitigation, and climate-smart agricultural techniques. This study additionally focuses on how social norms and expectations — that is, the differing social contexts in which women and men work — influence their relative agricultural productivity.

Analytic framework

The 2015 report, in line with the United Nations System of National Accounts definition, considered “work” to be anything individuals could theoretically pay another individual to do for them. However, labour that is performed for other household members is not counted as work. As a result, it is not considered in standard metrics of economic production or employment.

Productivity depends upon individuals being ready and able to work. Before people can become useful as labourers, they must be born, raised, fed, sheltered, clothed, kept in good health and educated. They must be taught requisite knowledge and skills to perform their labour. These preparatory tasks fall predominately on women. The Organisation for Economic Co-operation and Development has found that in all countries for which evidence exists, women do far more unpaid care and domestic work than do men. In terms of creating productive labour, these tasks are vital. Yet none of this necessary effort — most of it done by women — meets the standard definition of work. As a result, very few investigations into agricultural productivity pay attention to the burden of unpaid

work that is primarily borne by women and its implications for agricultural productivity.

Here lies this study’s crucial distinction from its predecessor. It offers a deeper insight into the underlying drivers of gender gaps in agricultural productivity, first and foremost, because it incorporates the facts of women’s unpaid labour into the overall understanding of productivity.

Clearly, unpaid care and domestic work come at a cost. Hours spent in unpaid household labour are hours unavailable for raising food or cash crops. As this report describes, the burden of unpaid labour follows on from deep-seated inequalities stemming from social norms and household power hierarchies. Under these norms and hierarchies, men exercise control over women, determine the distribution of work, and control the incomes and assets that work generates. Far too commonly, these social norms and values are enforced through violence — often, through sexual violence — the economic costs of which are only beginning to be quantified.

These social norms and values create a major imbalance of power in male-female relationships. Not only do women have fewer hours in which to tend their farms, they also have more limited control over the use or misuse of household income and less access to improved methods of farming and the tools such methods require. Less cash allows for fewer expenditures on household maintenance and on the seeds, fertilizer, pesticides, and climate-smart agricultural techniques needed to grow more crops. Lower incomes mean less money to spend on the goods and services that grow a country’s economy. Less money translates to less investment in personal skills, which also grow the economy.

In this way, social norms and values limit the capacity of female household members to

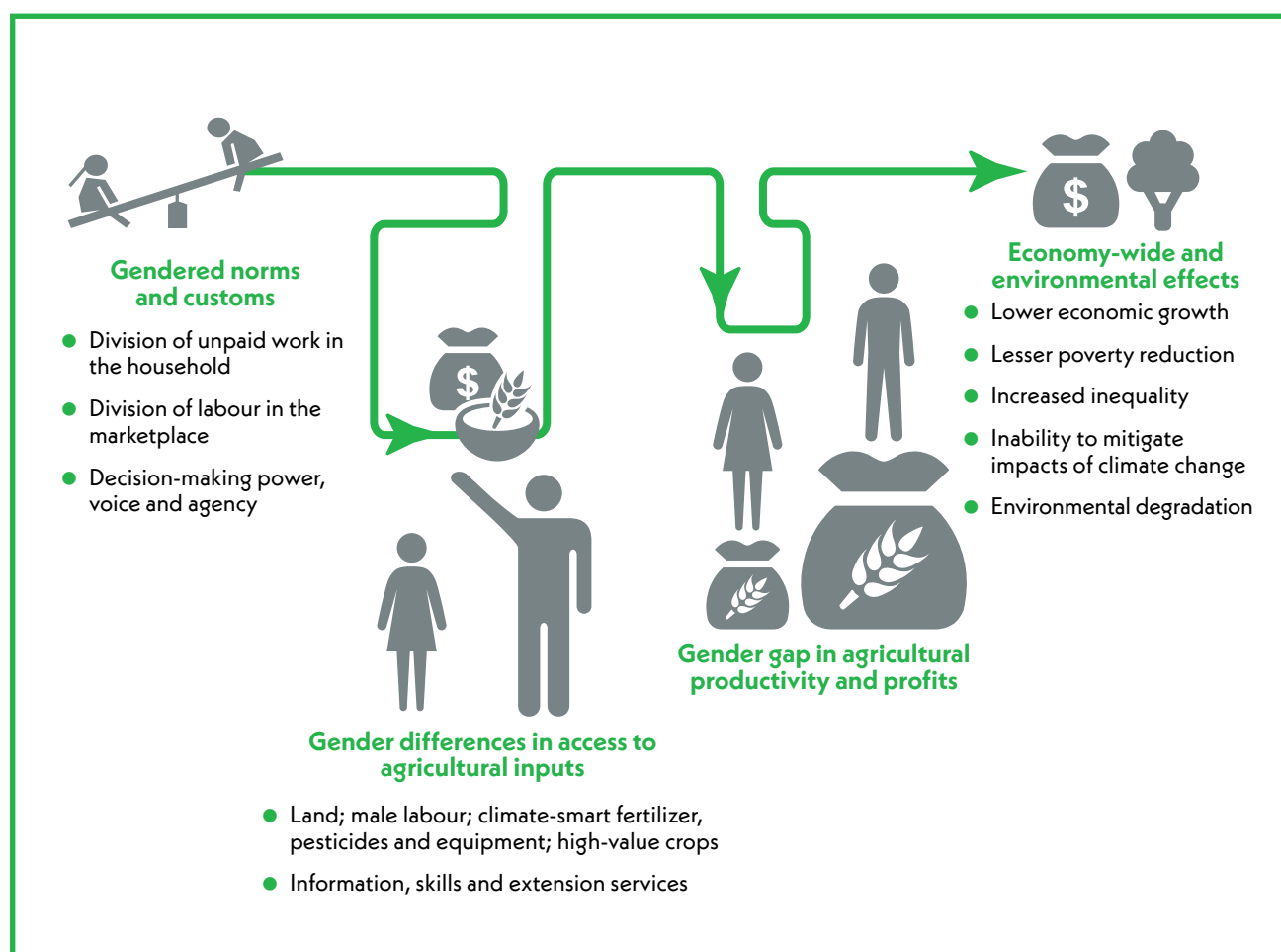
undertake economic production — which has a direct impact on agricultural productivity and important implications for gender equality and women’s economic empowerment. Gender differences in access to key farm inputs are a direct consequence of social norms and values. The resulting gender gaps in agricultural productivity and income only serve to reinforce the imbalance of power that underlies it. This way of understanding agricultural productivity is illustrated in Figure 2.

Gender-based differences in the undertaking of unpaid care and domestic work give rise to differences between women and men in the amount and type of productive labour that is done. As a result, women and men have distinctly different engagement with the

environment, natural resources and climate change, stemming from differences in knowledge and experience. Ongoing processes of climate change affect men and women farmers differently, and they may adopt differential coping and adaptation strategies in response. These choices in turn can have implications for agricultural productivity, household food security and cash incomes.

By focusing on the impact gender differences have on agricultural productivity in Tanzania, this study offers a new and important context in which the problems may be understood, and the steps needed to ameliorate these problems may be identified.

FIGURE 2
Path model of the gender gap in agricultural productivity



Methodology

The purpose of this study was to build on the findings of the 2015 report. To this end, qualitative primary data were collected through stakeholder consultations and interviews at the community and household levels in order to obtain a better understanding of the factors driving the quantitative gender gap in agricultural productivity.

The qualitative data collected were complemented by an extensive and rigorous desk review of available policy documents and research literature to situate the data within Tanzania's broader policy environment. The desk study described and explained the socio-economic, institutional, and policy constraints that influence the gender gap in agricultural productivity in Tanzania. The documentary review of key secondary materials included national strategies, programmes and policies on both gender and agriculture, as well as laws providing the legal basis on which women's equality issues are addressed in the country.

Fieldwork locations were selected, in part, because they represented the different agro-ecological zones of Tanzania and, further, because they were areas where the impact of climate change has recently been noted. The locations were:

- Central zone: Ikungi district in Singida region
- Lake zone: Bunda district in Mara region
- Western zone: Kibondo district in Kigoma region
- Northern zone: Ngorongoro district in Manyara region

While no effort was made to ascertain the extent to which these four districts are fully

statistically representative of Tanzania, it may nevertheless be stated that they are fairly typical of rural Tanzania. Resource limitations prevented the study from covering all of Tanzania's agro-ecological zones.

Fieldwork occurred between July and September 2017. Four to six villages were visited in each district, with a total of 19 villages involved. These villages included 8,678 households.

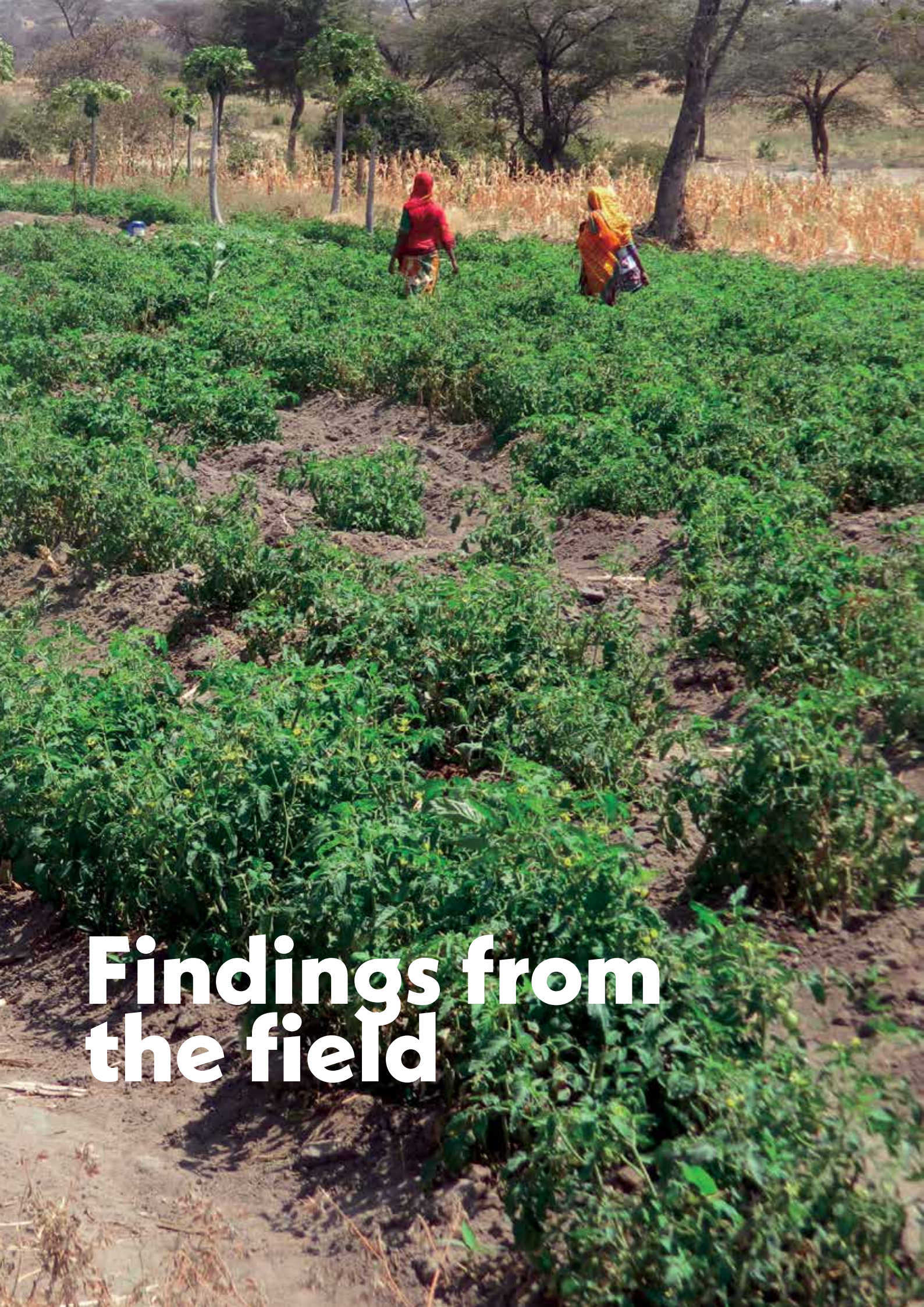
The key participatory methodologies used were semi-structured focus group discussions and key informant interviews. Checklists for each were developed to understand gender gaps in agricultural productivity. The discussions and interviews allowed identification of the impact of climatic variations and environmental degradation on agricultural productivity, along with the key drivers of those gendered impacts.

The focus group discussions involved groups of female and male farm managers; young, middle-aged and elderly farmers; women-only groups; and specific groups of farmers, such as members of cooperative societies. In all, 547 individuals took part in these discussions. Following each session, women farmers were asked to remain to answer an additional set of questions to confirm the validity of the information received in the wider focus group discussion. In all, 195 women took part in the women-only discussions. In these discussions, attention was paid to any gender-differentiated access to and quantities of the key factors of production: land, labour, seeds, fertilizers, water, tools and equipment. Where such circumstances were identified, the drivers of these differences were explored, along with their relative significance. The women-only discussions also identified whether decision-making over crop disposal was gendered and the way household income was shared. Finally, the women-only discussions explored the extent and effect of unpaid

care and domestic work and the prevalence and impacts of gender-based violence.

The study team also consulted stakeholders to review the findings of the 2015 report and to preview the preliminary findings of its qualitative fieldwork. Stakeholders included Tanzania's then–Ministry of Agriculture, Livestock and Fisheries; the Ministry of Finance and Planning; the Ministry of Health, Community Development, Gender, Elderly and Children; the National Bureau of Statistics; the Food

and Agriculture Organization of the United Nations; the Economic and Social Research Foundation; Policy Research for Development; the Tanzania Gender Networking Programme; the United States Agency for International Development; Mwananchi PPL; TaTEDO, the Tanzania Traditional Energy Development Organization; and the Makambaku Municipal Council.



Findings from the field

Farming system characteristics

The four districts studied are broadly similar in agricultural terms.⁸ Agriculture—the raising of crops and livestock—employs about 80 per cent of each district’s population. Farms typically range from 0.4 to 6.0 hectares; by custom, land is held over the generations by the household’s senior men, who claim to “own” it, even though they hold no formal title.

Farms produce cash crops for sale, subsistence crops for household use, and flexible (“flex”) crops that can either be used for food or sold. Food and flex crops include maize, cassava, sorghum, sweet potato, finger millet, beans, pigeon peas and, in some cases, rice. Sunflower, cotton, tobacco, groundnut and horticultural crops are the principal cash crops. Certain cash and flex crops are grown only by men on their plots; certain horticultural crops, grown for sale, are only grown by women. Women take principal responsibility for producing food crops for household subsistence.

The land is usually prepared by hoe, though agro-pastoralists often prepare land using cattle-drawn ploughs or, occasionally in Ngorongoro, tractors. Modern tools and equipment are rare. Most women and men plot operators in the four districts plant low-yielding local varieties of seed, although some men use improved seed for maize. Most use neither organic nor industrial fertilizers — they “kill the land,” said one male farmer in the Ngorongoro district, though a few fertilize with farmyard manure. Most farmers use little or no pesticide, and rely on rain rather than irrigation. This latter practice presents increasing problems, as climate change has increased the variability of rainfall and, consequently, the prevalence of droughts.

These factors lead to low and erratic crop yields. In Ngorongoro, maize yields are as little as one-quarter of the estimated potential of the land. Many households try to supplement their income by raising cattle, goats, sheep and chicken. In Bunda, those who live near Lake Victoria may also fish. Pastoralism is strongest in Ngorongoro, where 80 per cent of households keep livestock. Such pastoralism is under pressure, the district council reports, because of overgrazing of land and climate change-induced droughts and water shortages. Further difficulties ensue following harvest. The handling of harvested crops is negligent, and transportation to local markets is inefficient. The consequence is decreased income from crop or livestock marketing.

Polygamous marriage and patriarchal asset ownership are common. Assets are unevenly divided, with males controlling a far greater share. Decision-making relative to climate change and agriculture is similarly handled.

Women who marry rely upon their husband or their husband’s family for access to any land they may work. As a male farmer in the Ngorongoro district stated, “Women are not aware of their rights.” Indeed, widows commonly face pressure from male relatives who want to re-assume “ownership” of “their” land, and women typically do not defend their rights.

In most cases, marketing decisions are made by husbands. One man in the Bunda district stated, “At the end of the day, we control all the harvest from all the farm’s plots.” Men also control how money earned in local markets is used. As one woman from Ngorongoro stated, “We are not allowed to speak what is on our mind” where income is concerned.

The incidence of gender discrimination and gender violence varies among the four

“At the end of the day, we control all the harvest from all the farm’s plots.”

— Male Bunda farmer

districts studied, but the study fieldwork found that such practices are widespread (Table 1). Corroborating this finding, more than three-fifths of the women respondents to Tanzania’s 2015–2016 Demographic and Health Survey believe that wife-beating is an acceptable practice. A startling number have been the victims of actual physical violence.

Drivers of the gender gap in agricultural productivity

Figure 3 summarizes the principal findings of this study’s research into the most important drivers of the gender gap in Tanzania’s agricultural productivity, as identified by respondents across the 19 villages visited. The following subsections expand on these findings.

Women’s unpaid care and domestic work responsibilities

Informants in all 19 of the villages studied stated that the performance of unpaid care and domestic work was the most significant constraint on the time women had available to work their plots. Such unpaid and domestic work begins with preparing the household for the day — whether that be for work or for school — cleaning the home; caring for children, the ailing and the elderly; and ensuring

that food is prepared and available. Additionally, women are responsible for such unpaid tasks as collecting firewood and water, tasks that have grown more burdensome with climate change. As one Ngorongoro woman noted, “Nowadays, because of drought, you have to travel a much longer distance before you find water.” A second stated, “People are destroying trees in the search for firewood.” Typically, such household responsibilities absorb five to seven hours of a woman’s day, thereby greatly reducing the time available for women to work their plots.

Clearly, the time-consuming performance of unpaid care and domestic work has a significant opportunity cost for women. In the context of Tanzanian agriculture, if a woman spends time undertaking unpaid care or domestic work, the time she has available to work her own plot is thereby reduced. This, in practice, reduces a woman’s flexibility in how to spend time effectively and reduces opportunities for gaining income through non-farm employment. These factors combine to lower the productivity of land that is managed by women.

Women’s responsibilities to provide unpaid family farm labour

This study clearly identifies a neglected aspect of farming practices in Tanzania: social norms dictate that women work on

TABLE 1

Women’s exposure to and acceptance of practices of gender discrimination/violence, by district

Instance of gender discrimination/violence	Percentage of women providing affirmative responses			
	Ngorongoro	Bunda	Ikungi	Kibondo
Women have no say over major household decisions	32	22	14	21
Women think wife-beating is acceptable	69	89	64	76
Women are subjected to physical violence	34	61	31	43
Women are subjected to sexual violence	10	23	10	23
Women undergo genital mutilation	41	32	31	N/A

SOURCE: 2015–2016 Demographic and Health Survey.

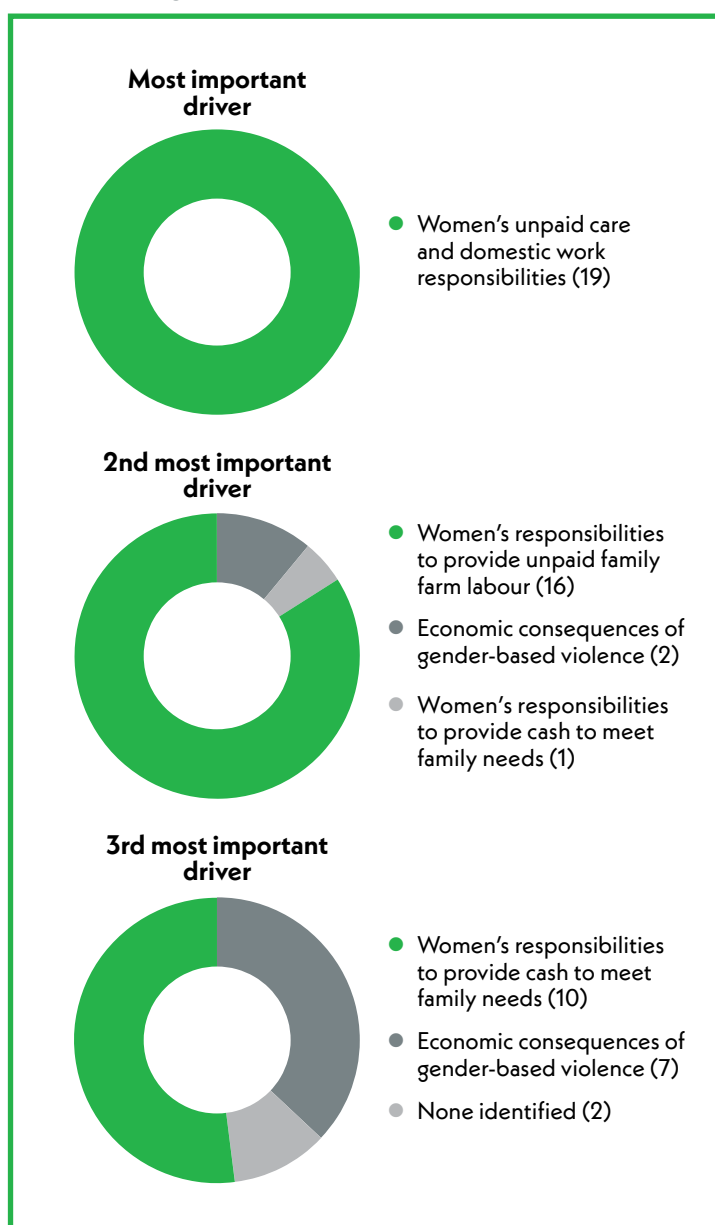
their husband's plots before working on their own. In monogamous marriages, men and women work together but perform different tasks. The amount of work done by women on jointly operated plots is typically much greater than that of their husbands, yet the husband controls the crop; determines if production exceeds household requirements, and when and where an excess will be sold; and controls the cash such sales generate. Wives may receive a portion of that income, but as they are not informed of the total that was earned, they do not know what share of the income they are receiving.

In polygamous marriages, senior wives are assigned to manage certain plots of land 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 on inferior land. The plots 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 the 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." Another Ngorongoro woman observed, "My husband has 10 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."

Before working their plots, wives are expected to finish work on their husband's plots. One woman in Bunda noted, "When we begin weeding our plots, the grasses are already much taller, and this lowers the yields on our plots." A woman in Ngorongoro called husbands "dictators." While women contribute the bulk of the work done on their

FIGURE 3

Most important drivers of the gender gap in Tanzania's agricultural productivity



NOTE: Figures in parentheses are the number of villages, out of a total of 19, in which a majority of focus group participants cited the particular driver.

husbands' farm plots, the husbands effectively act not as co-workers, but as managers of their wives' labour. For senior wives, work on their husbands' plots constitutes a significant claim on their time. This time also has an opportunity cost: when working on her husband's plot, the wife is unable to work on her own plot of land. This not only reduces the labour available on women's plots generally but

complicates the task of employing climate-smart agricultural practices at the appropriate time and sequence, thereby exacerbating women's vulnerability to climate change.

Polygamous marriages may be seen as a form of husbands' labour mobilization of women. The money earned by the labour of such women accrues not to them, but to the husbands. With the cash secured from their wives, men sometimes invest in a new junior wife, thereby increasing the labour pool for their own land. As an example, the Chapakazi Agricultural and Marketing Cooperative Society in Kibondo was formed by husbands to grow tobacco; less than 5 per cent of the membership is female. As a group of contract farmers, the men receive loans to purchase inputs, then rely heavily on their wives' unpaid efforts to grow the labour-intensive crop. Once the crop is sold, husbands do not share their incomes with their wives.

"Women seem tired all the time." — Key

informant

The Chapakazi cooperative demonstrates a key point: men commonly work less on their plots than they claim, and women work significantly longer on their husbands' plots of land than do the men themselves. Also, according to women respondents, husbands generally refuse to work at all on the land their senior wives control, further reducing the labour available for work on women's plots of land. In many instances, it is thus far more useful to understand husbands as managers of their wives' labour, which is performed to increase the income available for the husbands.

Women's responsibilities to provide cash to meet family needs

In Tanzanian society, women are assigned the principal responsibility for ensuring that the family's food is available and ready to eat. When food production from women's

plots fails to meet household needs, the women must earn the money to buy needed food. Conversely, money that is earned by husbands from the marketing of livestock, cash and flex crops is not shared with wives. The lack of redistribution of cash incomes within the household strongly reinforces the need for the wife to undertake casual waged labour and petty trading, or to sell flex crops from their plots, to earn the cash needed for household maintenance. This situation is exacerbated when husbands take food grown on their wives' plots and give it to another wife or sell it for cash. Moreover, women may receive a lower price for the products they bring to market simply because they are women. These factors combine to limit the incomes of women and to increase the demands on their time. As one key informant observed, "Women seem tired all the time."

Economic consequences of gender-based violence

Tanzanian men often assert their household authority over women through violence. The percentage of women suffering physical, sexual or emotional violence from their husbands runs from a low of 44 per cent in the Singida region to a high of 78 per cent in Mara (MoHCDGEC et al., 2016). Such violence is directed towards various ends. Men may use violence to claim cash earned by their wives or borrowed by them from village-level savings and loan groups. Violence may be directed at compelling wives to do unpaid labour on men's plots or to provide unpaid work as family caretaker and food provider. Some men use violence to force sex. As a man from the Bunda district put it, "Wife beating here is very normal." A woman from Ngorongoro said her husband wanted "food to be ready when he comes back home. If not, he beats me and all my children."

Such violence leads to physical injury, leaving women unable to work and thus falling further

behind in their duties as farmers and family providers. 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 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 trigger more gender-based violence on the part of some husbands.

Gender-based violence is a significant disincentive to women’s efforts to better their circumstances. The knowledge that the crops they grow or the cash they earn may be seized by their husbands deters women from efforts they might otherwise make. Thus, gender-based violence serves to reduce both the labour supply and the incentive to save for investment. A relative shortage of cash makes women less likely to invest in agricultural tools and equipment or to take the steps that could raise productivity through climate-smart agriculture. All these have consequences for agricultural productivity while limiting the ability of households to meet their food security objectives and ameliorate the poverty they may face.

Agricultural productivity, climate change and extension services

With their incomes largely devoted to household maintenance, women are less able to afford the agricultural technologies men use. They have less farm equipment and fewer tools, and are less likely to use improved seeds or chemical fertilizers, pesticides and herbicides.

Still, better access to these tools would not necessarily solve the problems women face

in this regard. Many villages lack agricultural extension officers; elsewhere, officers often lack the budget to visit the villages to which they are assigned. Such officers were in fact absent in the villages visited in this study. In their absence, the introduction of new, climate-friendly farming practices occurs only haphazardly. Provided a more adequate budget, agricultural extension officers would be capable of doing much more to support their communities and of doing so in a gender-responsive way. One possible role for these officers would be to introduce climate-smart agricultural practices such as:

- Conservation agriculture to manage the soil to retain its structure, biodiversity and micronutrients
- Crop selection aimed at choosing early maturing, drought-resistant and high-yielding varieties
- Manuring to help maintain soil fertility
- Rainwater harvesting, for better yields
- Agroforestry, to help sustain soil structure, composition and biodiversity

A minority of farmers already practice certain elements of climate-smart agriculture, such as intercropping maize and beans, switching to more drought-tolerant crops and faster-maturing seeds, manuring, and judicious watering and tree plantings. But these cases are sporadic, often undertaken with limited knowledge and guidance. Citing just one example, planting nearby trees would reduce the time required for women to collect firewood, improve water sources and increase soil fertility. Yet the leaders in only one village in the Ikungi district had received training

“Wife beating here is very normal.”

— Male Bunda villager

in climate-smart agriculture. Other farmers responded to climate change by praying for rain.

Study findings in light of the 2015 report

The 2015 report found that women farmers lacked access to sufficient male family labour as well as to the agricultural technologies they used. This study found the same problem, particularly among women who live in polygamous households or are widowed

or divorced. Polygamous husbands not only refuse to work their senior wives' lands but expect them to work their own lands before carrying out any other work.

This study mirrored the 2015 report in finding that women cannot afford the agricultural technologies needed to match men's productivity. Women's primary responsibility, as dictated by society, is to meet household needs, which leaves little time and money for better farming.

Cumulatively, men's control of women's time and labour, of marketing, and of household income leads to lower yields for women farmers, as was also identified in the 2015 report. Women's disadvantages in time and money make it harder for them to adapt to climate change, which requires extra labour and training. The principle economic driver of the gender gap in Tanzanian agriculture is women's burden of unpaid care and domestic

work. These disadvantages are often enforced by men through violence — the impact of which is multiplied by taking women out of work, reducing their incomes and discouraging them from saving or investing. It is thus not surprising that women plot operators have lower levels of agricultural productivity, even when controlling for the poor quantities and qualities of the land they operate. Women face the barrier of "time poverty," which generates lower levels of agricultural productivity.

As a counterfactual to these findings, it is worth introducing the Amani women's group in Kibondo (Box 1). The Amani women's group demonstrates that Tanzania's highly unequal social relations can change — and in the course of one generation. When educated women share their household chores, work their land collectively and reap the economies of scale, they find the time to generate more incomes and take control of their lives. The Amani women used their income to meet household maintenance needs and improve their plots. Their newfound economic independence has transformed gender relations at home. Granted, the allocation of unpaid care and domestic work continues to be gender biased. However, by sharing these responsibilities, they have been individually able to reduce their responsibilities, while enhancing their economic independence — and in so doing, to change the unequal social relations within which they had been enmeshed.

Women's disadvantages in time and money make it harder for them to adapt to climate change.

BOX 1

Closing the gender gap: the Amani women's group

First coming together as a dance group in school, and later as colleagues working a gravel mine, the members of the Amani women's group are also farmers, and thus subject to the widespread gender bias of Tanzanian agriculture. But with an unusually high level of education — most of them have at least seven years of schooling — the Amani women petitioned the Tanzanian government for land to farm as their own. The government responded by assigning the group more than 8 hectares. Though they were not granted formal title to this land, they acted as owners of it. Without any help from their husbands, the women grew cassava, planted maize with improved seeds and shared tasks. They sold the cassava as a group and reinvested their earnings in livestock, in acquiring improved seeds and in their daughters' educations. Four members of the group have daughters who have since graduated from or are now attending college.

Breaking from tradition, the women's husbands have not sought to seize their wives' earnings. Though

the women still have to work their husbands' plots as well as their own, their husbands share in the work. And not only is the work shared, so are the receipts from the plots' earnings, allowing the women greater say in how they were spent.

The Amani women have not had to resort to second jobs, like so many of their fellow farmers. They live in town, have formed a savings group and help each other with child care and domestic chores. Their husbands assist them in some of their unpaid care and domestic work responsibilities, most notably the care of grandchildren. None of the husbands of the Amani women have other wives, and none of the Amani women are subjected to intimate-partner violence.

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



Policy recommendations

This study indicates a series of gender-based constraints exist in Tanzania that, if addressed by policy, could increase women’s agricultural productivity. It has identified women farmers as suffering a poverty of time to farm, of cash to meet household needs, of access to improved farming techniques, of control over crops and assets, and of support from climate-smart agricultural extension services. All of these contribute to gender gaps in Tanzania’s agricultural productivity. This section presents policy solutions in three main categories:

- Boosting agricultural performance for both women and men
- Promoting policies that transform the material and cultural foundations of gender bias to free up farming time for women
- Further research into the gender constraints on agricultural productivity

Boosting agricultural performance

Climate-smart agricultural extension services

Agricultural extension services in rural Tanzania have become at best highly variable since the 1990s, and at worst have all but broken down. Yet for farmers to learn more productive methods, they will need agricultural extension services. Moreover, they will need to adopt more climate-smart agricultural techniques to respond to climate change. Fulfilling these needs will require extensive training from qualified and equipped agricultural extension officers.

Many villages in Tanzania are already practicing climate-smart agriculture without the support of agricultural extension officers

— albeit in a fragmentary and uncoordinated fashion. There is an urgent need to rebuild Tanzania’s agricultural extension system, ideally by placing its officers in villages where they are needed. These officers must recognize the disproportionate constraints facing women farmers.

Communications-based agricultural extension services

Low-cost information and communications technologies have strong potential to provide farmers with gender-responsive climate-smart agricultural practices. A majority of Tanzania’s rural farmers have mobile phones — used, for example, for financial services such as money transfers. Despite the existence of promising pilot programmes, the potential for using mobile phone technology to connect farmers with extension services has been poorly explored. For example, the United Nations Development Programme (UNDP) and the Economic and Social Research Foundation introduced the Mobile Kilimo platform to link farmers and traders, enabling farmers timely access to markets and prices.⁹ Various text-messaging platforms allow farmers to receive key agricultural information on agronomic practices, climate change and weather forecasts. Smartphones also have the potential to provide visual instructions in gender-responsive climate-smart agricultural techniques, serving as a virtual farming school.

The study therefore proposes an “e-agriculture” YouTube channel. Stemming from the Mobile Kilimo platform, e-agriculture would encompass other components of agricultural extension services to break down the production cycle of key crops. For each production stage of a given crop, a model farmer would be featured in a three- to four-minute video

There is an urgent need to rebuild Tanzania’s agricultural extension system.

describing, in Swahili, the best way of carrying out that stage. Perhaps a dozen such videos would be made featuring key crops and incorporating gender-responsive climate-smart agricultural practices. E-agriculture could thus be integrated into the broader coverage of Mobile Kilimo across Tanzania.

Women's access to land

Tanzanian law engenders land tenure through procedures that formalize customary land rights. Under the Village Lands Act, village lands may be apportioned to individuals or groups through certificates of customary rights of occupancy (CCROs). As the Amani women's

group has shown (see [Box 1](#)), assigning group rights to land can have a powerful impact on gender equality, especially when backed by 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 Tanzania's Mkurabita programme, which allocates CCROs across the country.

Both men's and women's names should be on the certificate of customary rights of occupancy when land is assigned to households.

This process needs to ensure that both men and women have their names on the CCROs, and that both receive copies of the CCROs when land is assigned to households. In addition, mechanisms need to be put in place to ensure that spouses' legal rights of joint ownership are enforced. Such documentation will also give women control of their land should their husband die. In other countries studied, including India and Vietnam, formalizing these rights has been associated with reductions in gender-based violence.

Value addition to women's agricultural products

Women may benefit from agricultural production at different stages of the value chain than men. The agricultural value chain must be analysed to determine where women engage and benefit the most. Policies are also needed to reduce post-harvest losses, which impose significant burdens on all farmers.

The Small Industries Development Organization has a key role in helping women transition to processing their crops, particularly when women come together as a self-help group. Village banks and credit cooperatives must be engaged, although they are greatly in need of resources and training in financial literacy. Such capacity-building should be predicated on extracting value from indigenous knowledge, such as the drying of food, the processing of dairy products and the use of solar energy.

The Tanzania Gender Networking Programme also has a role to play: its annual gender festival provides a forum for women processors of agricultural products to display their goods.

Revisions to agricultural statistics

Tanzania's National Bureau of Statistics produces data through 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. None, however, adequately capture gender relations. This was strongly evident in this study's fieldwork, wherein the impact of unpaid female labour on male-controlled farmland — or on land where husbands controlled crop disposal and cash incomes — was probably undercounted in National Panel Surveys because the principal respondents were male.

Tanzania's statistical instruments need to use both senior males and senior females of households as principal respondents in their surveys. This implies separate interviews with both. Another key objective should be to develop poverty measures for individuals, because measures of household poverty wrongly assume equal sharing of poverty risks among the members of a given household.

Extensive donor support exists for revisions to Tanzania's statistical system. Such revisions are also consistent with 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 (Bardasi et al., 2010). 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 gender disaggregation and gender responsiveness — especially with regard to assets, which has implications for understanding growth dynamics and their relationship to poverty reduction strategies.

Social norms and values

Since 1995, Tanzania has made institutional, policy and social progress towards realizing the aspirations of the 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.” But that progress has not been nearly as extensive as it might have been, despite research more than two decades old that has shown that improving cooperation between husbands and wives in Tanzania's agriculture can increase productivity and household income (Tibaijuka, 1994).¹⁰ The fieldwork conversely demonstrates

the implications for households lacking cooperation. Specifically, gender-based violence — clearly a lack of cooperation — contributes to gender gaps in agricultural productivity. This fits with the emerging advocacy and academic literature that considers gender-based violence to be more than a violation of civil and political rights, but also of economic and social rights (Puri, 2016). The fieldwork supports the view that the violation of economic rights has micro- and macro-economic consequences (National Center for Injury Prevention and Control, 2003). Gender-based violence is rooted in socially constructed norms and expectations around individual behaviour and the stereotypes they perpetuate. These findings suggest several policy avenues to confront these stereotypes.

Encouraging husbands to be partners with their wives

To change their stereotypical masculine behaviour, men themselves need to confront it. There is a need to identify, promote and facilitate male advocates of gender equality at the local, regional and national levels. As the success of the UN Women's #HeForShe global campaign demonstrates, policies that support engaging with men around gender stereotypes can be an important means of confronting corrosive dimensions of masculinity. They can help men recognize the importance of sharing the farm and household work conventionally expected of women — and, in so doing, improve agricultural productivity by fostering greater economies of scale.

Improving cooperation between husbands and wives in Tanzania's agriculture can increase productivity and household income.

Supporting women's self-help groups

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 (IFAD Independent Office of Evaluation, 2017). Such self-help groups empower women to claim the critical farming resources they may be lacking, learn new skills and enhance their bargaining power; as well as providing them with a forum for expressing their voice.

In too many communities, women's lack of agency stems from not knowing their choices, as well as from the use of intimate-partner violence to constrain choices when they are known. Women's self-help groups need to be facilitated by village government and development partners to discuss and confront gender-based violence, while informing women of their civil and political rights, especially when it comes to household assets and incomes. These groups can also transfer knowledge about livelihood

options — including climate-smart agriculture options — and enhance collective skills. Finally, they can offer a first opportunity for women to have a role in community decision-making and can prepare women for village leadership roles.

Women's lack of agency frequently stems from not knowing their choices.

The Amani women's group provides field evidence of all these benefits (see [Box 1](#)). A "digital village" programme in Ngorongoro has brought women together to improve their livelihoods by producing and marketing crafts, to great effect. As these examples demonstrate, women's self-help groups can improve livelihoods by empowering individuals to challenge gender-based violence and

stereotypes (Agarwal, 2010), and prepare more women for village leadership roles.

Rainwater harvesting

The fieldwork for this study found that, for many women, collecting water and fuel takes three to four hours every day. Among the 38 million rural Tanzanians, more than half have no access to an improved water source.¹¹ Tanzania, which averages more than a metre of rain a year spread between two rainy seasons, has an abundant supply of rainwater that, by and large, is not harvested. Utilizing this resource would reduce the time poverty that affects women in rural Tanzania. Further, the operating costs of rainwater harvesting are low, when local, low-cost materials are used to build storage jars and tanks.

Multiple Tanzanian projects harvest rainwater for soil conservation, irrigation, livestock, schools and household consumption. Through support from a non-governmental organization (NGO), Ereto Masaai Youth in Elerai expanded the rainwater collection system by building 30 storage tanks at selected public buildings. The result was a strong demand for more tanks (Kesho Trust and EMAYO, n.d.). In the Kilimanjaro region, UNDP has supported a local NGO in constructing micro-dams that collect water as it streams down hillsides. The micro-dam in one village can store up to 220,000 litres of rainwater for irrigation. According to UNDP, the project has resulted in better nutrition and higher incomes.¹²

Equipment and material costs are key constraints to adopting rainwater harvesting in Tanzania (Mwamila, Han and Katambara, 2016). There are also water shortages during the dry season, issues with water quality and a general lack of demonstration projects showing the benefits of rainwater harvesting. Rainwater harvesting in Tanzania thus remains a significantly under-utilized resource. However, the NGO WaterAid has produced

a technical brief on rainwater harvesting that demonstrates that a 1,500-litre storage jar in Uganda, using locally sourced materials and labour, can serve five households at a cost of T Sh 124,000, or \$55 (WaterAid, 2013).¹³

A government project in rainwater harvesting could be supported by multilateral and bilateral donors. While the details need to be refined, the project could begin by scaling up the most cost-effective practices from existing pilots, both within Tanzania and regionally. Consideration should go beyond manufactured water tanks to less costly tanks constructed with local materials, such as those suggested by WaterAid. This project could start small and at a relatively low cost, possibly using a randomized control trial to evaluate its effectiveness.

Solar cookers

Women are the gatherers of firewood in Tanzania, a chore that adds significantly to the time poverty they face. However, as more than a third of every day is bright and clear in Tanzania, the country has an abundance of solar energy that is not currently utilized by rural households as an energy source. Use of such solar power could offset the need to provide firewood and charcoal for cooking, thus freeing time that could be applied to raising agricultural productivity.

Problems do exist. Solar panels are the conventional means of converting sunshine to usable energy. Their cost, however, makes a universal rural programme prohibitively expensive. Alternatively, solar cookers can be constructed with local, inexpensive materials and negligible upkeep. The key limitations of solar cookers are that their energy yield relies on sunlight, that they perform optimally at mid-day and that some foods take longer to prepare using solar cookers. These limitations, however, must be weighed against the time otherwise devoted to collecting firewood and

the health benefits of using clean, smokeless energy. Systematic community-based education in the use of solar cookers would be required.

Interventions by NGOs and the private sector have been undertaken to provide solar cookers across Tanzania. The Tanzania Solar Bakery Project in the Kisarawe district recently provided marginalized women with a commercial solar oven. Interviews suggest that the oven led to higher incomes, better health and enhanced social status for women who took part in the project (Welch and De Francesco, 2017). More than 9,000 solar cookers of various designs have been distributed.¹⁴ 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 studies on the development and performance of solar cookers (Kimambo, 2007). The research found many of the cookers sufficient for households in areas with medium or high insolation. And while heating efficiency was an issue, the SunStove box cooker was able to cook 2 kilograms of rice, enough to feed a moderately sized family in Tanzania (Kimambo, 2007). Solar cookers available on the Internet cost far less than some piloted in these studies. Units that last approximately two years can be obtained for between \$3 and \$7 (T Sh 6,700–15,600).¹⁵

A pilot project could be initiated to introduce solar box ovens into villages and districts. The objective would be to start small at a relatively low cost, and then evaluate the effectiveness of the intervention, possibly through a randomized control trial. The project should factor in the direct cost of supplying the ovens along with training the community in their use. The goal would be to scale up the most successful pilots, both within Tanzania and regionally.

Tanzania has an abundance of solar energy that is not currently utilized by rural households as an energy source.

Lack of cash and its implications for agricultural productivity

Since the introduction of Vision 2025, Tanzania has implemented a wide variety of rural programmes and projects designed to boost agricultural production, incomes and household welfare. Because these programmes seek to manage risks and vulnerabilities, they constitute social protection. Often, however, these protections prove inadequate due to a lack of institutional capacity. For example, the National Agricultural Input Voucher Scheme pilot project, implemented with support from the World Bank, offered a three-year, 50 per cent subsidy to provide small-scale farmers with critical agricultural tools, such as fertilizers and improved seeds. In many

The most effective social protection for poor people lacking cash is to provide them with cash.

ways an admirable pilot, the scheme's lack of institutional capacities compromised its results. At the same time, as with many programmes and projects, gender constraints were not addressed in implementation, which affected project effectiveness.

International development institutions have established that the most effective social protection for poor people lacking cash is to provide them with cash. Claims that cash transfers are an inefficient use of scarce government resources are not supported by global comparisons (Hanlon, Barrientos and Hulme, 2010). 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. A three-year quasi-experimental evaluation in Zambia found that a cash transfer scheme strongly affected livestock ownership, fertilizer use, cash crop production

and school enrolments (Seidenfeld and Handa, 2011). A four-year randomized control trial of cash transfers in Uganda significantly boosted income, particularly among women, and found that mismanagement was limited (IPA, n.d.). A two-year randomized control trial of cash transfers in Kenya produced robust improvements in food consumption, reductions in child labour, accumulations of productive assets and increased formation of non-farm enterprises, particularly among women (Asfaw et al., 2014). Finally, an evaluation of a cash transfer scheme in rural Malawi demonstrated strong increases in food production and ownership of farming assets, and a significant decrease in casual labour (Boone et al., 2003).

The Tanzania Social Action Fund under the President's Office is implementing a nationwide Productive Social Safety Net (PSSN) programme, which targets women to receive cash transfers on behalf of their household. The programme reaches 1.1 million households, of which 51 per cent are headed by females (TASAF Management Unit, 2017). In addition, the Tanzanian government, with support from development partners, is developing a comprehensive and coordinated social protection policy. In light of this development, the PSSN programme should continue to ease the ways in which a lack of cash can constrain women's choices, especially in rural areas — reducing their reliance on second jobs and petty trading, and freeing time to allocate to their plots of land. This will improve labour productivity in women's farming.

Further research

Given the findings of this study, two further avenues of research are recommended:

- Re-estimate the gender gap in agricultural productivity in Tanzania using the

2014-15 National Panel Survey, but explicitly incorporating the key drivers of the gender gap — women’s unpaid care and domestic work in the household and in the community, unpaid family farm labour, and gender-based violence.

- Undertake quantitative research at the micro-level to incorporate the economic dimensions of gender-based violence and unpaid care and domestic work into estimates of the gender gap in agricultural productivity.

Additionally, Tanzania’s National Panel Survey, while statistically representative, has limitations which could be addressed. The survey focuses on household-level statistics, thereby overlooking significant differences in well-being that may exist between members of a single household. Further, it does not account for the effects of the unpaid labour to which the women of Tanzania devote a disproportionate amount of their time.

Notes

1. All currency conversions are based upon the prevailing average exchange rate in the relevant year, as reported by the International Monetary Fund. Source: <http://data.imf.org/regular.aspx?key=61545850>.
2. World Bank, World Development Indicators, <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>; accessed June 2017.
3. 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.
4. This analysis builds on work by Ali et al. (2015); Kilic, Palacios-Lopez and Goldstein (2015); and Slavchevska (2015).
5. UNESCO Global Partnership for Girls' and Women's Education – One Year On, www.unesco.org/eri/cp/factsheets_ed/TZ_EDFactSheet.pdf, accessed March 2018.
6. UN Women, Global Database on Violence against Women, <http://evaw-global-database.unwomen.org/en/countries/africa/united-republic-of-tanzania>, accessed June 2017.
7. Constitution of Tanzania, www.parliament.go.tz/publication/journals, accessed October 2017.
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