Gender Inequalities in Income and Land Access Constrain Agricultural Productivity in Rural Georgia

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Abstract

This paper analyzes gender inequalities in the Georgian agriculture sector, and considers possible support mechanisms by which the Government of Georgia might help bolster women's employment and entrepreneurship in rural communities. Drawing upon gender disaggregated data from the 2020 Agricultural Integrated Survey (AGRIS), conducted by the National Statistics Office of Georgia[1], we explore differences in earnings and differences in resource access across men and women farmers. The dataset includes 10,812 farm households, including 8,038 male-headed and 2,772 female-headed households. Descriptive statistics as well as observed variable OLS path analysis modeling reveal gender-based inequalities between female-headed and male-headed farm households. Male-headed households earn 4.8 times more income from selling agriculture products and more income from other income sources. Multivariate regression analysis suggests that gender of the household head and the number of workers in the household, as well as land ownership and access to credit, have direct and indirect effects on household incomes. Further qualitative in-depth interviews highlight some of the main challenges faced by women farmers in rural areas, including lack of access to land, and a lack of access to education and other resources, including vocational education, training programs, and access to modern technologies and machinery. The discussion and conclusions emphasize possibilities for government assistance for rural women to support women's economic empowerment and broader rural development in Georgia.

Keywords: gender equality, Georgia, women, agriculture

[1] Source: https://www.geostat.ge/en/project/32/sasoflo-meurneobata-integrirebuli-gamokvlevis-gankhorcieleba https://www.geostat.ge/media/38834/soflis_meurneoba_2020.pdf

I. Introduction

In 2015, The United Nations General Assembly adopted Agenda 2030 for Sustainable Development with its Resolution A/RES/70/1. This agenda contains 17 goals and 169 targets and is the sole global agenda that unites every country to achieve sustainable development with the core principle of "leaving no one behind". The country of Georgia has taken several initiatives in an effort to contribute to sustainable development. The Government of Georgia started the process of nationalization of the Sustainable Development Goals (SDGs) in 2015 and undertook important steps in this direction.[2] The government has further committed to conducting detailed and systematic assessments of progress towards the nationalized SDGs, including Goal 5: Gender Equality, under which 7 targets and 17 indicators were defined.[3]

Since 2017, Georgia has taken significant steps to promote gender equality and eliminate violence against women through changes in legislation or policy (UNDP, 2021, p.29).[4] The Constitution of Georgia, the Anti-Discrimination Law of Georgia (2014) and the Gender Equality Law of Georgia (2010) have been considered umbrella legal documents covering gender equality concerns together with international instruments relating to SDG commitments (UN Women, 2020[5]). In addition, the Gender Equality Council of the Parliament of Georgia (GEC) was converted into a Standing Body responsible for developing the legislative base in the sphere of gender equality and for providing strategic policy recommendations for consideration and endorsement. However, there are still significant gaps in legislation, policy, and practices relating to gender equality in Georgia that require State attention and investment (UNDP, 2021, p.86).

In an effort to fill data gaps in rural gender statistics in Georgia, this paper focuses on gender inequalities in the agriculture sector, examining differences in agricultural earnings and resource access across female-headed and male-headed households. We draw on gender-disaggregated data from the 2020 Agricultural Integrated Survey (AGRIS) survey, collected by the National Statistics Office of Georgia. The database includes 10,812 households, 74% of which are male-headed and 26% female-headed households. The paper proceeds as follows. Section 2 develops the conceptual framework for the study. Section 3 presents the data and Section 4 the analytical approach. Section 5 summarizes key findings and Section 6 discuss the results and policy implications.

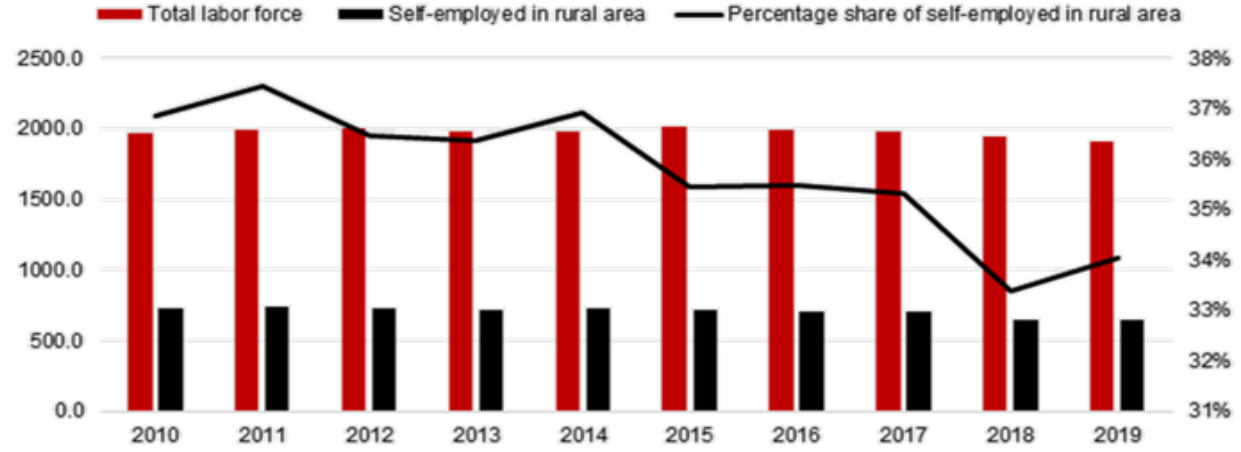
II. Review of Literature

Women's participation in the labor force is one of the key global indicators for gender equality. The overall labor participation rate in Georgia over the past 10 years stood at 62 to 67 percent for men versus only 40 to 46 percent for women, suggesting significant gender gaps remain in the labor market (Geostat, 2021[7]). Meanwhile the unemployment rate, another labor force measure, is higher for men (20 percent) than for women (16 percent) – but this ratio also suggests potential barriers to women's access to labor markets, as many more women than men are not actively seeking employment, and hence they are not identified as unemployed by national statistics (Geostat, 2021). According to Geostat (2020), employment in agriculture is particularly high in Georgian rural areas. The rural self-employed constituted 34% of the total labor force in 2019

[2] Source: https://sdg.gov.ge/intro
[3] Source: https://sdg.gov.ge/goals-details-inner/5
[4] Gender Equality in Georgia: Barriers and Recommendations - Updated Edition (Part II), UNDP, 2021, p.29
[5] Source: https://georgia.unwomen.org/sites/default/files/Field%20Office%20Georgia/Attachments/Publications/2020/Country%20Gender%20Equality%20Profile%20of%20Georgia.pdf
[6] Gender Equality in Georgia: Barriers and Recommendations - Updated Edition (Part II), UNDP, 2021, p.8
[7] Women and Men in Georgia, Geostat, 2021

(Geostat, 2020). Thus, more than one-third of the rural labor force in Georgia is likely to be employed in agriculture.

Figure 1. Self-Employment (Primarily Agriculture) in Rural Georgia (thousands).

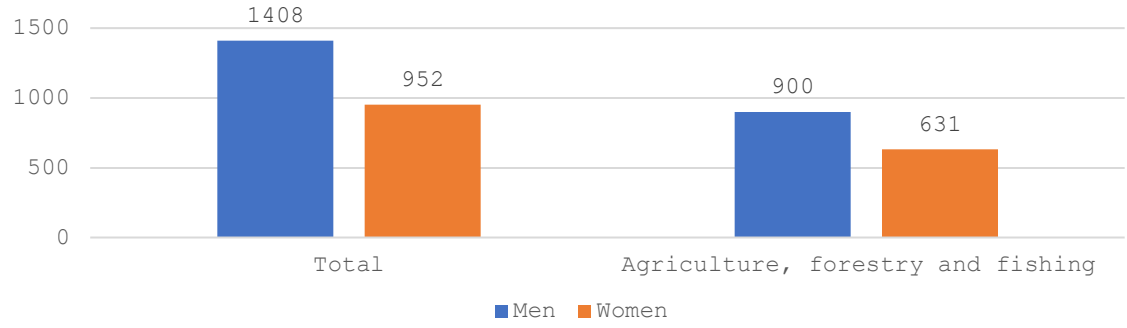


Source: Geostat, ISET[8]

In the agricultural sector, 65% of agriculture, forestry and fishing sector workers are men vs. 35% women (Geostat, LFS, 2021). And according to the most recent Agricultural Integrated Survey (AGRIS) data fully 74% of agricultural households are male-headed vs. 26% female-headed.

Another key indicator of gender inequality is the gender pay gap, which is very large in Georgia. According to the latest available statistics from the National Statistics Office of Georgia (2020), the ratio of women's wages to men's wages based on approximate average monthly nominal earnings was 67.6 percent in 2020, and 63.8 percent in 2019 (Geostat, 2021). In 2020, monthly earnings were on average 1,408 Gel for men vs. only 952 Gel for women (Geostat, Gender Statistics[9]). In the agricultural sector disparities in incomes among women and men follow a similar trend: average monthly nominal earnings in agriculture, forestry and fishing in 2020 was 631 Gel for women and 900 Gel for men, a ratio of women's to men's earnings of 70.1%.

Figure 2. Average monthly nominal earnings, 2020 (Gel).



Source: Geostat

A potentially more precise indicator for earnings disparities related to gender inequality could be the "adjusted gender pay gap", which shows the differences between average men's and women's

[8] ISET, 2020, https://iset-pi.ge/en/blog/98-agriculture-in-georgia-are-there-any-real-changes-in-the-sector
[9] Source: http://gender.geostat.ge/gender/index.php?action=Income

wages, accounting for differences in endowments, most notably education, as well as a range of job characteristics (UN Women, 2020, p.9).[10] In 2020, the adjusted hourly gender pay gap in Georgia was an estimated 15.9%. However, the pay gap calculated at the monthly level was 21.4% (Geostat, 2022[11,12]). Higher pay gaps at the monthly level are most likely attributable to the fact that women do more unpaid, family-care work, while men can devote more hours each month to paid work, including potential to work overtime and earn even higher wages. Indeed, past study findings suggest employed women in Georgia earn less than employed men for each hour of work even when women possess equal or better professional training (education and work experience) (UN Women, 2020). The same study found pay gaps also vary widely across sectors. The highest hourly gender pay gaps have been observed in the service sector (16.8%) followed by the industry sector (15.4%) and the construction sector (13.2 %). In contrast, in the agriculture sector, the adjusted gender pay gap was *negative* at -8.5% (meaning the average hourly wage of men was lower than the average hourly wage of women), and the monthly gender pay gap was positive but still comparatively low (4.5%). These differences between gender disparities in agriculture versus in other sectors may in part be explained by the fact that in agriculture there is high share of unpaid family work by women which does not appear in wage data at all (UN Women, 2021). For example, available data on self-employment suggest 42.2% of self-employed women in Georgia are contributing family workers, versus only 14.2% of self-employed men (Geostat, 2021).

Cultural factors also strongly contribute to observed gender inequalities in Georgia, especially in rural areas. In Georgia, a man is traditionally the head of the household; accordingly, the share of male-headed households in the country exceeds 60 percent (Geostat, 2021, p.82). In rural areas, the difference is even higher – 71.6% of households are male-headed.

Cultural expectations rooted in gender norms also impact time-use decisions in ways that affect women's versus men's earning potential. According to the latest survey conducted by Geostat with U.N. Women's technical support, sixty-six percent of Georgia's population engages in unpaid domestic work**,** with women (88.3 percent) and men (39.6 percent) participating at starkly different rates. Rural women's participation in unpaid domestic work (90.3 percent) is highest. On average, adults in Georgia spend 2.1 hours per day on unpaid domestic services for the household and family members—with a large gender disparity in this statistic. Nationally, the time spent per day by men is 0.7 hours; in contrast, the time spent by women on these activities is five times more in rural areas (3.6 hours) and 4.7 times more in urban areas (3.2 hours) (*Time Use Survey in Georgia 2020-2021*, UN Women, 2022, p.12).

Another substantial challenge for gender equality in Georgia is women's unequal access to property rights. Limited or no access to property is one of the major barriers for women's empowerment in rural areas worldwide (Oxfam, 2015, as cited in FAO, 2018, p. 31). Even where formal policies legally protect women's access to property, traditional norms may continue to perpetuate historical inequalities: in Georgia, according to UN Women, equal property rights and the principle of gender equality are each protected by law in Georgia. Nevertheless, people are often guided by a tradition in which the owners of real estate may only be male. This problem is further aggravated because women's level of awareness about property rights, especially in rural

[10] Analysis of the Gender Pay Gap and Gender Inequality in the Labor Market in Georgia, UN Women, Tbilisi, Georgia, 2020, pg. 9

[11] Adjusted Gender Pay Gap 2020, Geostat, 2022

[12] The calculation of the adjusted gender pay gap has been fully based on the Labor Force Survey of Geostat, which interviews more than 15,000 respondents quarterly.

areas, remains low.[13] According to 2020 Geostat data, 81% of the agriculture land area consists of male-headed agriculture holdings. Georgia's women are legally entitled to own and inherit land and property, but customary practices usually give men privilege in property inheritance, ownership, and administration. Consequently, the participation of women in agricultural activities is lower than that of men.[14] Women who are engaged in agriculture are also more likely to be involved in low-income activities than men, such as subsistence agriculture.

The Government of Georgia acknowledges the problem of women's unequal access to business opportunities, including access to finance, and it also acknowledges women's rights and potential benefits of women's broader engagement in small- and medium-scale entrepreneurship. This is reflected in the **SME Development Strategy of Georgia, 2021-2025** by The Ministry of Economy and Sustainable Development of Georgia, where one of the 7 declared priorities is supporting women's entrepreneurship (Ministry of Economy, 2020[15]). Other national strategies emphasize the need to develop evidence-based policy recommendations to support the Georgian government's aims towards elimination of gender inequalities in the economy and agriculture. In particular, The Ministry of Environmental Protection and Agriculture of Georgia goal number 1 - competitive agricultural and non-agricultural sectors defined by its **National Strategy of Agriculture and Rural Development of Georgia, 2021-2027,** which underlines and recognizes the distinct needs of rural women in terms of support and economic empowerment.[16]

III. Conceptual Framework/Theoretical Background

Women's activities in agriculture are characterized by global gender gaps in vulnerability, access to resources, and farm productivity (FAO, 2011; Perez et al., 2015; Quisumbing & Pandolfelli, 2010 as cited in Huyer, 2016). According to a World Bank study, the gender gap in agricultural productivity ranges from 4 to 25 percent, depending on the country and the crop, with the estimated costs of gender gaps in agriculture ranging from $100 million in Malawi, to $105 million in Tanzania, and $67 million in Uganda annually (UN Women, UNDP, UNEP, & World Bank, 2015; Huyer, 2016). Gender gaps are visible in regard to six key resources and inputs for agriculture: land, labor, credit, information, extension, and technology (Sheahan & Barrett, 2014; Huyer, 2016; World Bank, 2012; World Bank & IFPRI, 2010).

The Food and Agriculture Organization (FAO) of the United Nations report "Gender, agriculture and rural development in Georgia" published in 2018 highlighted many challenges and knowledge gaps in the area of gender, agriculture and rural development in Georgia. The report drew attention to rural women's time poverty, emphasized women's limited access to productive resources such as land, finance and decision-making – and more limited when compared to men – access to information, new technologies and agricultural inputs[17]. The report highlighted the following key gender inequalities in agriculture and rural development in Georgia:

[13] Source: https://georgia.unwomen.org/en/stories/news/2022/03/un-women-working-to-promote-womens-property-rights

[14] https://www.undp.org/georgia/publications/gender-equality-georgia-barriers-and-recommendations-2018

[15] Source: https://www.economy.ge/uploads/files/2017/ek__politika/sme_strategy/2022/sme_strategy_2021_2025_eng_2.pdf

[16] Saurce: https://eu4georgia.eu/wp-content/uploads/Agriculture-and-Rural-Development-Strategy-of-Georgia-2021%E2%80%932027.pdf

[17] FAO. 2018. *Gender, agriculture and rural development in Georgia – Country Gender Assessment Series.* Rome, pp. 80 License: CC BY-NC-SA 3.0 IGO.

- There is still a gap between legislation and policies seeking to support rural women and the implementation of such policies;
- The social status of women in rural areas remains low, gender stereotypes persist and there is a low awareness of existing gender inequalities;
- There is a significant gender pay gap, and women are overrepresented as unpaid workers;
- There is a gender gap in technical and professional expertise in agriculture and rural development;
- Women's access to information, innovation and knowledge is lower compared to men;
- Women´s access to new technologies, machinery and agricultural inputs is lower compared to men;
- Women have limited access to ownership of land and other property;
- Women have limited access to larger, more profitable and wholesale markets;
- Women are underrepresented in cooperatives both as members and as chairpersons;
- There are persistent gender imbalances in food and nutrition security;
- Poor rural infrastructure, limited access to transport and modern energy supplies have a direct impact on time use;
- There is low access to finance in rural communities;
- Rigid gender-based roles also affect men negatively as it places a great deal of pressure on men; and
- There are still data gaps on gender issues in agriculture and rural development (FAO, 2018, pp. 55-55)

More recently the Ministry of Environmental Protection and Agriculture of Georgia has also stressed the point of gender inequalities in agriculture in its **National Strategy of Agriculture and Rural Development of Georgia, 2021-2027**. The strategy contains an analysis of strengths, weaknesses, opportunities, and threats (SWOT analysis) in the Georgian agriculture sector which emphasizes a number of gender-related concerns including:

- High levels of rural unemployment, especially among women;
- Relatively high rates of poverty (especially among women and young people) and an increased risk of social vulnerability;
- High self-employment rates in low-productivity sectors, especially among rural women, as well as gender pay gaps and women's unpaid work;
- Women's limited access to information, modern technologies and agricultural resources, compared to men;
- Women's limited access to agricultural land, other real estate and finances;
- Poor access to vocational education and training, especially among rural women; and
- Unequal distribution of household responsibilities between women and men.

According to the same SWOT analysis, the Government of Georgia envisages more opportunities in women's economic empowerment, including increasing women's employment, expanding access to education and technologies, growing women's participation in decision-making, and enhancing women farmers' access to local and international markets.

Since the Government of Georgia started the process of nationalization of SDGs in 2015, the country has prioritized all 17 goals, nationalizing 93 targets and 200 indicators – all depicted in

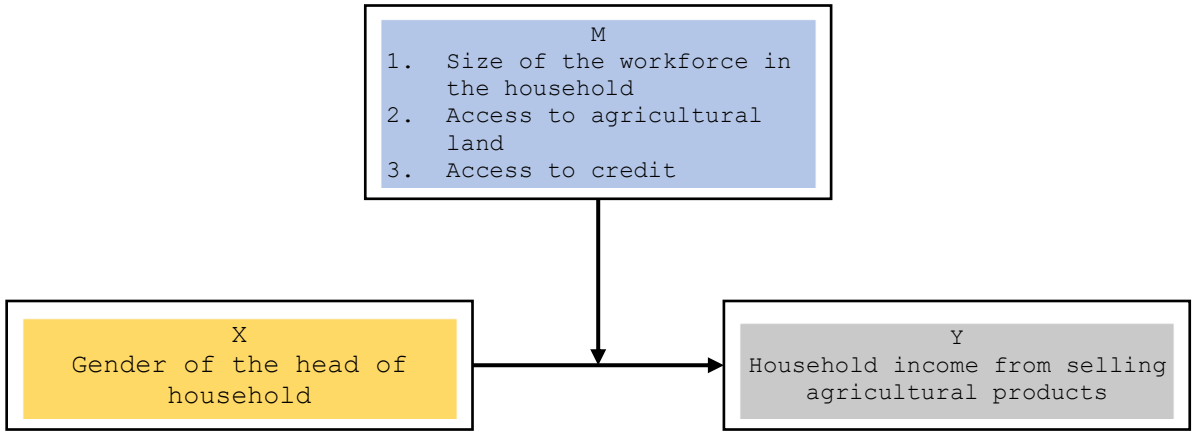
the National Document for Sustainable Development Goals (Decree #2328 of the Government of Georgia).[18] This paper specifically focuses on three SDG targets (Table 1):

Table 1. Georgia Adjusted SDG Targets: Gender and Agricultural Development.

1	**Goal 2.3:** By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, family farmers, fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment
2	**Goal 5.a:** Undertake measures and address customary practices to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property and inheritance
3	**Goal 5.b:** Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women

Drawing on newly available nationally representative gender-disaggregated data, we analyze how women's empowerment in agriculture might relate to economic benefits including increased productivity and incomes. An initial set of bivariate analyses looks at variation in household earnings, household expenditures, access to agricultural resources, and household labor productivity across male-headed and female-headed households. We then further examine how three indicators of resource access might interact with the gender of the head of household in influencing household income from selling agricultural products, using mediation analysis (Hayes, 2017).[19] We define Gender of the head of household as an independent variable and test its association with the dependent variable - Household income earned through selling agricultural products – as moderated by Size of the workforce in the household, Access to agricultural land, and Access to credit (Figure 1).

Figure 1. Conceptual Model.



To shed further light on statistical results obtained through use of the AGRIS data, we additionally conducted a series of qualitative interviews with women farmers in different regions of Georgia. Although not a representative sample, these qualitative data allow us to provide a more nuanced picture of women's working patterns and challenges faced in agriculture, and to consider possible government interventions to support increased women's productivity in agriculture.

[18] Source: https://sdg.gov.ge/intro
[19] www.guilford.com/p/hayes3

IV. Data

The paper draws upon gender-disaggregated farm household survey data from the 2020 Agricultural Integrated Survey (AGRIS), conducted by the National Statistics Office of Georgia with support from the United States Agency for International Development (USAID) and the Bill and Melinda Gates Foundation.[20] The nationally representative dataset includes 10,812 farm households, including 8,038 male-headed and 2,772 female-headed households, and includes a series of modules providing data on characteristics of the household, farm characteristics, production, and market engagement, among others. We consider differences between male-headed and female-headed households in terms of four groups of variables:

Table 2. Key Variables and Measures.

Variables	Measures
1. Household earnings	• Production harvested by the household • Income generated through sales of agriculture products • Income gained from work performed on another farm • Income for renting land and buildings • Other income sources
2. Household expenditures	• Consisting of 20 common household costs
3. Access to agricultural resources	• Area of owned land • Area of rented land • Number of parcels operated by the household • Total area of the farm • Area of the sown, harvested land by the household • Use of fertilizers, manure and pesticides by the household • Use of agricultural credit
4. Household labor productivity	• Number of workers & female workers in the household • Number of days worked / hours worked

Supplemental qualitative data include ten in-depth interviews with women farmers from six different regions of Georgia: Samegrelo, Imereti, Guria, Shida Kartli, Kakheti. Recruitment was carried out using the snowball method. The interviewees pursued different types of farming, including crop (potatoes, fruits, berry crops) and livestock farm systems (milk and milk products), and produced both for their own consumption and for market sale. Interviews were conducted via an online platform; the length of the interview was about 30-40 minutes. All interviews were then fully transcribed for analysis.

V. Analysis

5.1 AGRIS data analysis

Initial bivariate analyses apply a combination of crosstabulation and chi-square tests, and means comparison via independent samples t-tests for continuous variables.

[20] Source: https://www.geostat.ge/en/project/32/sasoflo-meurneobata-integrirebuli-gamokvlevis-gankhorcieleba https://www.geostat.ge/media/38834/soflis_meurneoba_2020.pdf

In subsequent multivariate tests we then used observed variable OLS path analysis modeling (Hayes, 2017) to estimate direct and indirect effects of gender of the head of household on household income from farm sales. We consider the total effect of gender of the head of household on household income from selling agricultural products as mediated by three different variables relating to resource constraints including size of the workforce in the household (number of adults in the household), access to agricultural land (farm size), and access to credit (expenditure on repaying agricultural credit).

5.2 Qualitative data analysis

Qualitative in-depth interviews highlight some of the main challenges faced by women farmers in rural areas, including lack of access to land, and a lack of access to education and other resources, including vocational education, training programs, and access to modern technologies and machinery. Interview transcripts were reviewed by the lead authors and emergent themes identified; illustrative quotes are then drawn from the transcripts to highlight key themes, including possibilities for government assistance for rural women to support women's economic empowerment and broader rural development.

VI. Results

6.1 Household earnings

AGRIS identifies four major source of household income: (1) income generated through sales of agricultural products (2) income gained for work performed on another farm (3) income for renting land and buildings and (4) other income sources. Overall male-headed households generate more income on average through the first three sources of income.

Bivariate tests suggest mean income from selling agricultural products in male-headed households in rural Georgia is 4.8 times greater than that of female-headed households, with statistically significant differences observed for both crop sales and livestock sales (Table 3).

Table 3. Farm household earnings by gender of the household head.

	Male-headed household			**Female-headed household**			**Test results**	
Income source	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	(A) Male headed	(B) Female headed
Crop	9589	128748	11103	3637	39213	2676	B(.018)	
Hay	1848	4725	115	638	833	27		
Livestock	9181	70689	2547	2670	6644	482	B(.043)	
Product	41265	580799	1656	10117	99489	319		
Secondary product	2507	13735	248	323	603	89		
Total	25228	341222	7889	5274	57289	2710	B(.002)	

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.
Significance level for upper case letters (A, B, C): .05
a. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

For off-farm income, on average male-headed households generate 1,952 Gel with cash and 252 Gel with in-kind quarterly for performing work for another farm. These income figures are significantly higher than those of female-led households (Table 4). Similarly, on average male-headed households generate 4,807 Gel with cash and 251 Gel with in-kind quarterly for renting land and buildings, with a much lower mean for female-headed households, which could reflect women's relatively lower access to agricultural land.

Table 4. Farm household income from other farms by gender of the household head.

Income source	Male-headed household			Female-headed household			Test results	
	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	(A) Male headed	(B) Female headed
Off-farm income with cash (GEL)	1952	16136	10872	1187	1283	4473	B(.002)	
Off-farm income in kind (GEL)	252	208	148	100	0	70	B(.000)	
Rental income with cash (GEL)	4807	71920	538	617	1101	555		
Rental income in kind (GEL)	251	202	81	123	58	312	B(.000)	

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean. Significance level for upper case letters (A, B, C): .05
a. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

6.2 Household expenditures

In terms of household expenditures, AGRIS data suggest that on average male-headed households have higher expenditures on common household items than female-headed households. In particular, male-headed households spend signifiantly more on hiring machinery than female-headed households – which could again be a reflection of women's low access to agricultural land. Several other common household items exhibit significant differences (Table 5); however, valid numbers are too low for interpretation.

Table 5. Farm household expenditures by gender of the household head.

Income source	Male-headed household			Female-headed household			Test results	
	Mean	St. Dev.	Valid N	Mean	St. Dev.	Valid N	(A) Male headed	(B) Female headed
Feed	10012	145123	3202	3806	75436	889		
Costs of processing	717	15367	1378	379	6796	421		
Hiring machinery	1267	7314	1529	477	2616	370	B(.041)	
Hiring labor force	17377	123481	1087	10396	71782	221		
Veterinary services	1167	12247	934	440	4161	192		
Fuel (for own machinery)	1975	12065	1275	1773	8627	180		
Purchasing livestock	7776	43641	487	3939	32866	89		
Electricity for agricultural activities	8480	102203	444	4327	23870	71		
Seeds and seedlings	5721	22937	297	4635	20465	48		
Repair and maintenance	3200	10391	221	3294	12767	34		
Taxes	9393	23270	222	12325	37049	26		
Water for irrigation	1153	5510	119	660	1900	21		
Rent for farm buildings, land	14834	56396	176	9634	18052	20		
Repaying agricultural credit	54056	280326	159	62771	157884	18		
Purchasing agricultural machinery	60952	124417	44	363749	786409	6		A(.016)

Constructing agricultural buildings	44404	91062	25	274667	311779	3	A(.005)
Improving agricultural land	80517	220296	13	1060	1329	2	
Purchasing agricultural land	55466	138408	12	10900	12869	2	
Contractual services	12880	9473	5	34822		1	
Purchasing agricultural buildings	15274		1			0	

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.
Significance level for upper case letters (A, B, C): .05
a. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

6.3 Household labor productivity

Most households in the AGRIS data spend less than 4 hours per day working in agriculture. Female-headed households on average have a smaller labor force working for the household. In male-headed households there are more days when household workers work for the full day (8 hours or more) (mean = 6 days) when compared to female-headed households (mean=4 days). Workers are also more likely to work half days (from 4 hr to 7 hr) in male-headed households, while the rate of household workers working less than half day (less than 4 hr) is the same for both male- and female-headed households (Table 6).

Table 6. Farm household expenditures by gender of the household head.

	Male-headed household			**Female-headed household**			**Test results**	
Income source	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	(A) Male headed	(B) Female headed
Total household workforce	2	21	19037	1	3	5382	B(.028)	
Female workers in the household	1	11	19028	1	2	5381		
Full workdays	6	17	18759	4	13	5358	B(.000)	
Half workdays	13	22	18763	10	19	5360	B(.000)	
Partial workdays (less than 4hr)	37	34	18761	37	35	5367		

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.
Significance level for upper case letters (A, B, C): .05
a. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

Male-headed household on average exhibit higher levels of production, both sowing and harvesting larger areas and producing greater harvests (Table 6).

Table 6. Farm production by gender of the household head.

	Male-headed household			**Female-headed household**			**Test results**	
Income source	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	(A) Male headed	(B) Female headed
Area sown	1.1025	16.9884	29941	0.4053	8.9043	8932	B(.000)	
Area harvested	1.0629	16.4479	29941	0.3958	8.8667	8932	B(.000)	

Production harvested	2633	31496	37247	1443	30606	11088	B(.000)	

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.
Significance level for upper case letters (A, B, C): .05
a. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

However, as summarized in Table 7, male-headed households also use more fertilizers, manure and pesticides.

Table 7. Input use by gender of the household head.

	Male-headed household			**Female-headed household**			**Test results**	
Income source	Mean	Standard Deviation	Valid N	Mean	Standard Deviation	Valid N	(A) Male headed	(B) Female headed
Total fertilizer (kg)	2033	17123	4001	841	5836	986	B(.031)	
Gifted fertilizer (kg)	5	50	3770	4	26	954		
Price of 1 kg fertilizer (GEL)	3	12	3951	3	9	957		
Area fertilized (temporary)	7.164	79.518	6633	1.885	13.465	1704	B(.006)	
Area fertilized (permanent)	13.985	206.356	4797	17.145	118.040	1167		
Total manure (kg)	3001	12933	2301	2363	2358	594		
Price of 1 kg manure (GEL)	1627	8502	112	295	650	22		
Area fertilized by manure (temporary)	0.411	6.190	2301	0.268	3.297	594		
Area fertilized by manure (permanent)	0.214	2.347	2299	0.119	0.7154	594		
Total pesticide	98	582	6997	75	384	1508		
Price of 1 unit pesticide (GEL)	36.61	58.30	6904	29.20	50.79	1476	B(.000)	
Area treated (temporary)	3.306	45.335	7378	0.796	5.587	1647	B(.025)	
Area treated (permanent)	18.932	220.888	8390	14.748	112.581	1904		

Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.
Significance level for upper case letters (A, B, C): .05
a. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

6.4 Mediation analysis

Using multivariate OLS path analysis, we found that gender of the household has a direct effect on household income earned from selling agricultural products, and that the number of workers in the household is a mediator of this effect (Table 8). Female-headed households have statistically significantly lower income from farm sales ($t=-4.387$, $p<0.001$), and households with larger numbers of agricultural workers also experience lower sales on average (perhaps reflecting greater subsistence needs for larger numbers of household members). However because female-headed households on average have fewer household members, the indirect effect of gender on farm sales

via household labor is positive – this may reflect female-headed households engaging in expanded market sales as a coping strategy when faced with lower labor availability in the household.

Table 8. Observed variable OLS mediation model: farm sales as a function of gender of the household head, mediated by household labor force.

OUTCOME VARIABLE:
Household income earned through selling agricultural products

Model Summary

R	R-sq	MSE	F	df1	df2	p
.0982	.0096	8.675E+010	51.6198	2.0000	10596.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	83697.6213	6882.7626	12.1605	.0000	70206.1133	97189.1293
Gender	-29064.324	6624.8490	-4.3872	.0000	-42050.273	-16078.375
Workers	-29174.004	3009.3575	-9.6944	.0000	-35072.910	-23275.098

********** DIRECT AND INDIRECT EFFECTS OF X ON Y **********

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
-29064.324	6624.8490	-4.3872	.0000	-42050.273	-16078.375

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Workers	9111.0742	1975.5406	5663.7887	13326.9801

Sample size: 10599
Level of confidence for all confidence intervals is 95%.

A similar pattern was observed when examining the possible mediating effect of agricultural land owned by the household on overall household income across male- and female-headed households. In Table 9, we see that gender of the household head has a significant direct effect on household income, and this effect is mediated by agricultural land ownership. Female-headed households on average have significantly lower household incomes ($p=0.013$), while households with great land area and access to credit on average have higher incomes ($p<0.001$). In this model, however, we observe additional negative indirect effects of gender on income via farm area (women have less access to land, further constraining incomes) and also via credit. Although the indirect effect of gender on income via credit is not statistically significant, there is a significant indirect effect of gender via lower land ownership having a negative effect on the household's access to credit, and this lack of access to credit reducing household income (Table 9).

Table 9. Observed variable OLS mediation model: income as a function of gender of the household head, mediated by land and credit access.

```
OUTCOME VARIABLE:
 income

Model Summary
          R        R-sq         MSE          F        df1         df2          p
      .2878       .0829 8.034E+010   319.0521     3.0000 10595.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant 18115.6300  3202.3874     5.6569     .0000 11838.3488 24392.9111
gender   -15638.990  6313.1823    -2.4772     .0133 -28014.013 -3263.9658
area        377.3579    18.4654    20.4360     .0000   341.1623   413.5535
credit        1.7523      .0776    22.5943     .0000     1.6003     1.9043

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
 -15638.990  6313.1823    -2.4772     .0133 -28014.013 -3263.9658

Indirect effect(s) of X on Y:
          Effect     BootSE   BootLLCI   BootULCI
TOTAL -4314.2600  1903.6610 -9298.1524 -1666.5309
Ind1  -3148.9862  1524.1616 -7226.1729 -1301.7722
Ind2  -1094.9890  1142.6750 -3693.7301   843.0118
Ind3    -70.2849    95.9700  -373.2513   -29.4373

Indirect effect key:
Ind1 gender      ->    area        ->    income
Ind2 gender      ->    credit      ->    income
Ind3 gender      ->    area        ->    credit      ->    income
Sample size:  10599
Level of confidence for all confidence intervals is 95%.
```

6.5 Qualitative interview findings

In qualitative interviews with 10 women farmers across Georgia several consistent themes emerged, relating to women's work responsibilities on the farm and in the household, challenges faced by farmers in Georgia in general and by women farmers in particular, and finally potential opportunities for policies and programs to support women in agriculture.

<u>Women's engagement in farming</u>

Women are actively involved in farming in Georgia. They sow the crops, harvest, gather wood, plow the land, and milk, clean and feed livestock. According to interview respondents, the male representatives of the family usually do common tasks that require more physical strength, for example, herding cattle to pastures, pruning fruit trees, plowing the land, working with a tractor, providing irrigation water, etc. Meanwhile family caregiving and housework are mostly performed by women. They clean, prepare food, etc. - men occasionally help them, for example, in cooking, but this is more of an exception, it happens when the woman is busy with some other activity or is not at home. Often, women farmers try to do household care activities early in the day so to freely engage in farming later on. Among the household work, a man's duties usually include chopping firewood.

The majority of interviewed women farmers also are in charge of finding channels for product sales, for example, with the help of a circle of acquaintances, they acquire regular customers to whom they repeatedly deliver their products, as well as sell products to resellers, bring them to the nearby markets, etc. There are cases when a woman is entrusted with more office work, for example, in the case of medium and large farms, where there is no shortage of labor.

Among the interview respondents were women who either did not have a husband, or whose husband works in another city and is mostly absent from home - in such cases women have to manage the farm alone, often hiring labor to perform heavy work.

> *"My husband is in the military and is often not at home, so I take care of the farm alone, there are tasks that I can't do alone, for example, I can't process the land with a tractor. In such cases, I hire workers. When my husband is at home, he also gets involved in everything, it is much easier."*

Main challenges for farmers in Georgia

According to the women interviewed, one of the most important problems in agriculture overall in Georgia is **the marketing of products and access to markets.** The severity of this problem depends on the region and village, in some villages it is particularly difficult for farmers to sell their products, there is no agricultural market nearby, the village is far from the city or regional center, or the village is in a high mountainous region. Others lack physical assets such as adequate housing, roads, transport and communication needed for market participation. Lack of access to land and physical assets deprives poor farmers of a means of saving, a form of insurance, and a means of securing loans, thus increasing their vulnerability to shocks and setbacks.

The problem of market access also depends on the type of products grown, for example, there are fruits that cost more to grow than the benefits obtained from it. According to one respondent, a 17-kg package of plums sometimes sells for as little as 3 GEL, therefore, picking it often makes no sense and it remains on the tree and rots. Agricultural markets are also often characterized by boom and bust cycles, for example, when a new fruit comes to the market, everyone starts planting it, which creates oversupply. Exporting agricultural produce is associated with many difficulties and requires substantial financial resources. In this regard, the situation in Shida Kartli worsened after the Samachablo war. According to one respondent, export is complicated by the fact that the customs tax has increased and it is often no longer worth it for resellers, for example, from Azerbaijan to come to Georgia and export some products, therefore, this particular farmer no longer grows tomatoes because she cannot sell them.

Irrigation is another problem reported by farmers. There is poor availability of drinking and irrigation water in some villages, and water is distributed irregularly – in some cases inhabitants themselves distribute water, deciding where and how much water to release, which can cause local conflicts. This issue is particularly problematic for women farmers who do not have a male family member, as the water distribution process is usually led by men, and it is difficult for women to gain authority in this process.

> *"Men argue with each other about where and how much water to release and when, I really don't want to take part in those arguments"*

There is a problem of pastures in some villages, especially in high mountainous villages, according to the respondents, in the 1990s, when the lands were distributed, they did not leave free pastures, and therefore there is a tendency for fewer people to have cattle.

> *"Having cattle when there is no problem with pasture is quite profitable, but in our case it is not so, because it is quite expensive to feed them."*

According to interviewees, the price of cattle feed has increased in the last few years**.** Those who have just started cattle breeding and do not grow food raw materials, do not have the appropriate technical equipment, it is difficult to buy and obtain feed for cattle. Livestock rearing is also problematic in **densely populated** villages, where neighbors object to the noise and smell from cattle. In such a case, farmers have to think about building a farm away from the village, which is associated with additional financial costs.

Costs incurred to produce quality livestock products, for example milk, do not always correspond to the market price of the product. According to one farmer, government is involved as an intermediary in milk markets, and is trying to set a minimum price threshold for milk, but at this stage this problem has not been **regulated yet.** According to the respondent, setting an adequate price for the purchase of a milk could compensate for the increased prices for cattle feeding.

Some of the interviewed respondents expressed concern about **the quality of pesticides**. According to them, pesticides often do not perform their function properly, and because of this, crops are often of poor quality and rotten. According to the farmers, this should be controlled by the government; there is a suspicion that expired or falsified products are being sold, and therefore the expenditure incurred by them is vain.

Most of the villages **do not have their own tractor** and therefore they have to rent a tractor. Increased fuel cost makes this service more expensive. In general, according to women farmers, prices have increased for everything: fertilizers, cattle feed, fuel.

Natural disasters, bad weather conditions, drought, and hail were also frequently cited as challenges that harm farmers. Some farmers had a skeptical attitude towards the insurance system in Georgia, they believed that there is a risk that the loss will not be compensated, while others said they simply did not have enough information about insurance services or had no interest in spending money on it.

Some villages have not been **connected to the Internet,** which prevents farmers living in these villages from selling their products and developing their businesses.

Interviewees who pursued cattle breeding on a medium and large scale were worried about **the lack of specialized veterinarians and qualified human resources** in the field of animal husbandry. Self-taught veterinarians often work on farms. According to one respondent, there are relevant TVET training programs, but they are unpopular and interest is low despite high demand.

The issue of product certification is also challenging. There are a number of issues that cannot be controlled by the farmer, for example, **the quality of drinking water.** It often does not meet the appropriate standards, which prevents obtaining the GeoGAP hygiene standards certificate. Farmers are asking for support from the government to solve this problem.

The pandemic has particularly affected farms that have foreign breeds of cattle that require special care. Such cattle do not receive regular feed, special feed is prepared for them with different ingredients. During the **pandemic it was difficult to bring these ingredients to Georgia.**

Challenges for women farmers

According to multiple interview respondents women farmers face especially acute challenges, as they often have to do **both housework and farm management**, which is quite time-consuming. There are women who additionally work elsewhere, for example in schools. Women farmers face many **stereotypes** in the course of their activities, they are often taken lightly by society. One farmer gave an example that when a woman calls a company and is interested in a particular drug or tractor, company representatives answer her questions with mockery.

There are farming families where women farmers feel harmonious and equal with male family members, where there is no stereotype that a woman cannot do something, for example, she cannot be a veterinarian, she cannot be a farmer, she cannot make important decisions – however, these are exceptional cases. In most cases, it is difficult for a woman in Georgia to make a decision to be independent and bold in her choice, in her profession, because society does not encourage it, rather the contrary.

Several farmers mentioned that **land and property are often registered to men**, and a majority of women have no single property registered in their name. This prevents them from participating in various grant competitions. Also, if you are not the owner of the land, you cannot use the agro-card, provided by the government.

Women farmers also noted that there are specific tasks in agriculture that require **physical strength**, at such times a woman may be unable to operate by herself and needs to pay extra money for hired labor. They also noted it can be difficult for women to **care for livestock alone**. One respondent observed that sometimes cattle are out late and the owner has to go and find them – but she expressed concern that if a woman goes far from home late in the day or evening, then she may not be able to do necessary housework, may face additional costs of childcare, or she may meet a wild animal on the road. Others emphasized rural women also often do not have access to **modern equipment** while caring for livestock, such as milking machines - they instead have to milk the cows by hand, which is difficult and time-consuming.

Women farmers also often do not have access to **information about trainings or grant programs** taking place in their region. Besides agricultural vocational programs are not available in all regions. According to them, women are often more interested in these types of activities than men and it is important for them to be informed. Indeed, there is some evidence that women in rural agricultural households substantially outperform urban women in terms of Information and Communication Technologies usage. Several respondents also mentioned TASO Foundation, which is non-governmental organization focused on the involvement of women in various activities, including farming, and provides funds in this field, offering granting opportunities for women's business ideas, supports their professional development.

Income and access to finance

In part because it is rare for a female farmer to have land plots registered in her name, women often face barriers in the process of obtaining loans from the bank. Most of the respondents did not have such a problem themselves, because they owned land or were co-owners or did not try to take out a loan at all, due to the small volume of business, but many reported this problem from

the experience of neighbors/relatives. According to interviewees, a key problem is social norms about property registration. Parents, as a rule, transfer property, including land, to their male children as inheritance, which later creates problems for women in the process of obtaining business loans and in general business development. For example, there are state support programs for seedlings targeted to land owners, but if a woman does not have a plot in her name, she is automatically excluded from this program.

Public awareness raising was named as another important factor in overcoming gender stereotypes and reshaping gender norms. According to women, it's easier for men to have jobs, for example, so they have more access to finance and more financial opportunities than women.

Governmental support

Women farmers reported several challenges and goals relating to government support. For example, the state offers farmers agro-cards tailored to small plot owners. They earn points that can be used to purchase necessary inputs. Most of the interviewed women had this card and had used them, it was just unclear to them how the points were allocated and how often the points were credited to the card.

Others noted that for the last 2 years, the government did offer farmers good price for fallen off apples. This initiative was quite helpful for farmers because is resolved their problem related to very low price for such apples. The state supported the cultivation of fruit trees, but owners of small sized plots could not participate in the program. According to the farmers, relaxing the participation criteria for this program could support more women's participation.

Others expressed concern that although the government offers agricultural loans to farmers, such loans are typically given for a short period of time, and it can be difficult to develop a business in such a way that it can repay this loan. Apart from the short term, the loan has a high interest rate. Some respondents concluded that one cannot breed livestock, for example, sufficiently quickly so as to repay this loan on time.

Some farmers highlighted policy and program efforts targeting women farmers specifically. For example, the Georgian Farmers' Association and Enterprise Georgia implements various activities to support farmers, including women farmers. Two respondents were winners of "Enterprise Georgia" and positively evaluated their experiences and the benefits they received. According to the respondents, the Ministry of Agriculture conducts trainings on various topics, for example, animal husbandry, fruit growing, or new crop production. It also conducts surveys to identify farmers' problems. One respondent positively mentioned that, by the state initiative, the registration of hazelnut plots is now underway, and farmers will be paid 50 GEL for every 1000 meters of hazelnuts grown. Another supporting activity for farmers, from the perspective of one respondent, was the opportunity to obtain a fully subsidized GeoGAP certification for safe food production.

Suggested state interventions to support women farmers

When asked directly how policy reforms might support women farmers in Georgia, respondents suggested the following initiatives:

Education, modern technologies and access to information

- Vocational training courses in agriculture, veterinary services and other agricultural specialist trainings;

- Support in product development, packaging and modern product design;
- Public awareness campaigns and access to information, it would be good to have a single platform where all news can be posted for farmers;
- Foreign language courses. Farmers sometimes have to deal with English-language documents, for example, for seed or livestock purchases; knowledge of languages is also important for establishing contacts abroad;
- Retraining in modern production techniques. Access to modern technologies is important, especially for large farms, in order to make the most of modern advances, which makes the business more profitable and cost-effective. For example, artificial insemination in cattle breeding, or installation of innovative thermometers, which is associated with a large amount of investment but reduces the risks of livestock diseases, saves human resources and reduces costs.
- Exchange programs with other farms to gain experience in Georgia or abroad;
- Support, both in terms of inventory, and by sharing knowledge, for example, about milking and feeding machines;
- Cheese technology learning courses, master classes, for preparation of non-traditional, for example European types of cheese;
- Internet access, especially in highland villages.

Sales market, export and finances

- Long-term and low-interest rate loans, especially for new farmers;
- Product collection spots that will be geographically close to the farmer's village to avoid transportation costs;
- Support for local markets and appropriate infrastructure for local food purchases by Georgian resorts;
- Milk storage refrigerators, in order to have the opportunity to store products and not have to sell them quickly, which would allow to increase the volume of perishable products;
- Facilitating the cultivation of expensive and sought-after fruit or vegetables and advising on whether they are worth growing or not;
- Getting information about business development, what is the market demand, what is more profitable, etc.;
- Support relating the sales of bio and organic products. The price of products plays a decisive role in the market, and the production of organic products is more expensive, which affects the price of the product and complicates its sale;
- Support from the state for exporting products, for example EU-Georgia association and DCFTA grantees can access EU markets, but women farmers still often lack the capacity to be involved in these higher-value markets;
- Rural-urban linkages and value chains in agriculture, including farm gate marketing, transportation, selling products, distribution chains, etc.;
- Strengthened transport and logistics infrastructure for rural farmers.

Supporting agricultural production

- Support farmer women's access to veterinarians and vaccines;
- Provide women farmers with small tractors / Provide small villages with shared tractors;
- Implement programs to provide additional labor access for women-headed households to perform necessary manual labor;

- Coupons reducing the costs of fertilizers, pesticides, fuel, and cattle feed;
- Invest in berry crops in highland villages, including government support for cultivation of new frost-resistant varieties;
- Active involvement of the government during losses from natural disasters, including proper insurance services.

VII. Conclusions

The results of this mixed-methods study provide detailed insights into challenges faced by women farmers in rural Georgia, and important policy recommendations to support closing agricultural productivity gaps and realizing SDG targets. An analysis of AGRIS farm household survey data shows that male-headed households earn 4.8 times more income from selling agricultural products and also more income from another income sources, including working on other farms and renting land and buildings. Factors associated with these productivity gaps include male-headed households having 2 times greater labor force in the household to perform agricultural production, and owning 2.8 times more land than female-headed households on average. Multivariate statistical analyses further showed that gender has a direct effect on farm and household incomes, as well as indirect effects via the number of workers in the household as well as land ownership. Finally, barriers to women's land ownership have the further indirect effect of reducing female-headed households' access to agricultural credit, further reducing household incomes.

These findings are broadly consistent with the review of the previous limited literature on women in agriculture in Georgia and consistent with our qualitative analysis where women farmers interviewed explicitly emphasized that a lack of access to agricultural land is one of the main challenges for women farmers in Georgia. One of the main challenges expressed by women farmers through interviews is that they do not hold any type of property, land, car or house. Because of this reason, they cannot participate in various grant programs, cannot use agro-cards, and cannot receive agro-loans. There are families where this problem is easily solved and, if necessary, women can easily register property in their name or become co-owners, but there are cases when this barrier prevents women from starting or developing their own agricultural business. According some interviewees, this is caused by the stereotypes that exist in the society about property registration. Parents, as a rule, transfer property - including land - via inheritance to their male children. This tradition later creates challenges for women in the process of obtaining business loans and in general business development.

Other women farmers observed that men are more likely to be employed in high-paying jobs, so they have more resources for business development, greater access to credit, and greater financial autonomy. In addition, there are some activities that are considered "men's jobs", like driving a tractor. Due to the fact that women farmers have to manage family care work as well as being involved in farming, they often do not have the opportunity to find more information about the latest developments in agriculture. Women farmers have a great desire to improve professional education. They want to be informed about innovations in agriculture, they want to own modern technologies that will ease physical labor, to have more information on how to manage and develop a business, and more accessible resources showing what grant programs exist that they might be eligible for.

Women farmers in Georgia often have to put in a lot of work to manage the farm and at the same time be fully dedicated to family care work. There are cases when women simultaneously work in schools, kindergartens or other institutions, which makes their daily life even more difficult. In

addition to physical fatigue, they also face social challenges. Often in their society, a strong, courageous woman is not accepted positively, but without these qualities, it is difficult for a female farmer to achieve success. In addition to physical strength, due to the views established in society, she also needs strength not to give up her goals. According to the women interviewed, it is important to fight against the stereotypes in the society and to support women farmers, because according to their observation, a farming family is more successful when there is a strong and fulfilled woman in the household.

Based on the identified challenges the research team developed recommendations for supporting rural agriculture in Georgia, with a special focus on women farmers. Recommendations cover three main directions:

Education, modern technologies and access to information

- **Qualified human resources** to plug the gap in technical and professional expertise in agriculture as well as well-functioning **vocational education and training programs** for women are indispensable to reduce inequality and create decent work for all in agriculture;
- **Access to information** in general plays a huge role in amplifying women's capacity and entrepreneurship opportunities. In this regards its utmost important to ensure **access to the internet** for women farmers. Types of information which will be supporting women include: new knowledge and innovations in agricultural production; modern technologies and machinery; learning and training opportunities; grant opportunities; sales and market opportunities. This recommendation is clearly aligned with SDG Goal 5b [21];
- **Training opportunities** for women in modern technologies, machinery and modern production is important for farmer women to boost their productivity and capacity. Trainings for improving women's foreign language literacy could also be important to enable their access to various opportunities and knowledge.

Sales market, finances and infrastructure

- Forward-looking investments in entrepreneurial skills and **access to finances and markets** are key factors for accelerating women's success in agricultural production and trade; these will be very important for women farmers in future decades in Georgia. Trade policies to date have pushed and pulled flows of people, goods, and services from rural to urban areas. For trade policies to be successful in rural areas it is necessary to put in place more inclusive value chains, such that rural Georgian farmers and traders can also enjoy the benefits coming from the EU-Georgia DCFTA and other free trade agreements. Well-structured trade systems, including expanded access to large, profitable markets, is a key action in the reduction of inequality, poverty, and can be effective in boosting incomes and productivity in the agricultural sector. This recommendation responds to SDG Goal 2.3 [22], and thus serves the Government of Georgia's stated priorities to increase agricultural productivity and incomes of small-scale food producers, in particular women;
- Promoting access to finances for women farmers including access to **state funding opportunities** as well as funding through commercial institutions;

[21] SDG Goal number 5.b (Georgia Adjusted Target): Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women

[22] SDG Goal 2.3 (Georgia Adjusted Target): By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, family farmers, fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

- Supporting women's **ownership of land** and other property, which is an important precondition of improving rural women's entrepreneurship abilities. Awareness-raising activities should also be implemented aiming at changing social norms with respect to property inheritance traditions. This recommendation is aligned with SDG Goal 5a [23];
- The quality of life of rural farmers can be improved through enhancing public **transportation and utility provision** and thus facilitating accessibility for basic services, including water and irrigation systems;
- Providing market **research-based guidance** for women farmers with respect to planning their production according to market needs and opportunities.

Supporting agricultural production

- Various **state support schemes** play important roles in boosting agricultural production, these include state-funded fertilizers, pesticides, fuel, cattle feed, seedlings, tractor renting, vaccines and veterinarian services; special arrangements should be made within the existing state programs to **ensure women's eligibility and support participation**;
- State support and developed insurance schemes in cases of **natural disaster** damages is also important for rural farmers due to high risk of natural disasters.

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[23] SDG Goal 5.a (Georgia Adjusted Target)**:** Undertake measures and address customary practices to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property and inheritance

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