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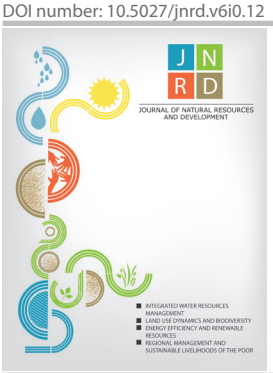

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Gendered Access and Control Over Land and Water Resources in the Southern Agricultural Growth Corridor of Tanzania

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Abstract

This paper assessed the gendered access and control over land and water, using the Ihemi cluster of the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) as a study area. Specifically, the paper answered the question on how decisions are made between men and women over land and water in the SAGCOT area, as well as how access and control over land and water is conducted. Data for this paper was drawn from the baseline study which was conducted for the project known as Laying Foundation for Effective Landscape-level Planning for Sustainable Development (LiFELand). A cross-sectional research design was used, whereby a questionnaire was administered to 167 women and 440 men. In addition, focus group discussions and key informant interviews were also conducted to complement and allow triangulation of data. Quantitative data was analyzed descriptively; while, qualitative data was analyzed using content analysis. In general, the results show that female headed households accounted for more than a quarter of the surveyed households; the number was slightly higher in the Njombe region. Results further show that women had no control over land and water as important productive resources in rural areas. The results also show that a larger proportion of both men and women had no right of occupancy over the land they owned hence their inability to use it as collateral in accessing loans from formal financial institutions. The paper therefore recommends efforts be made to empower women, hence enabling them to actively participate in decision-making, particularly regarding land and water. Equitable decision-making power can immensely enhance ecosystem conservation and sustainable utilization over land and water as women are the major actors in agriculture. To achieve gender equality there is a need for awareness creation for both men and women using gender sensitive programs that will allow not only equality in use but a sustainable utilization of Land and Water as important natural resources in the SAGCOT (Southern Agriculture Growth Corridor) areas.

1. Introduction

Natural resources when sustainably utilized can support life on earth through provision of food, fuel, fresh water, medicine and air regulation, to mention a few. Studies **[1]** indicate that 1.3 billion subsistence farmers depend on natural resources for their livelihood. However, unsustainable use of natural resources results in an increasingly stressed environment leading to natural disasters such as desertification, flood, biodiversity losses and endangered humans, animal species and plants. To bring about change in natural resource patterns requires an understanding of their underlying causes. While there are many causes such as overuse of natural resources due to increased population, other authors **[2]** mention unequal gender patterns of access to and control over natural resources.

Women's rights to land are mainly considered as a mere right of use, without the possibility to make decisions on selling, hiring or changing its use. Similarly, land and water ownership is biased against women **[3]**. The rights of women in land use are viewed through their participation in agriculture, whereby their contribution in agriculture, more specifically in food production, is high compared to men. More than 60 % of agricultural activities are performed by women in Tanzania **[1]**. Despite women's central role in agricultural production in the country, women continue to face discrimination in owning land and water as important natural resources for agriculture. According to the literature **[1]**; **[3]** women's traditional roles as care givers, water and fuel wood collectors makes them overly affected by the negative impact of environmental degradation. Furthermore, there are unequal power relations between men and women based on historical, religious, economic and cultural realities **[4]**. Normally, women are poorly represented when it comes to decision making on issues related to natural resources due to culture and power differences between men and women. However, women are believed to possess knowledge and resilient skills for adaptation **[5]**. Generally, the resilience of households and communities depends on women, as they work hard to feed their families during difficult times resulting from natural resource degradation. Therefore, involving women in the ownership over natural resources is highly recommended as this will harness women's resilience skills and hence increase agricultural productivity. Based on the above, to ensure women's access to and control over natural resources, the Tanzanian government is striving towards mainstreaming gender in the development process as well as in research projects.

In line with the above, a project known as Laying the Foundation for Effective Landscape-level Planning for Sustainable Development (LiFELand) in the SAGCOT corridor was launched in April 2015. The LiFELand project aimed at supporting local institutions, investors, and policy-makers in sustainable development planning within the cluster. Among other things, the project seeks to mainstream gender to enhance sustainable development in the SAGCOT area. In addition, the project addressed the existing unsustainable use of natural resource (land and water) within the Ihemi cluster. The Ihemi cluster is one of six clusters that make up the SAGCOT area; the others are Rufiji, Sumbawanga, Ludewa, Kilombero and Mbarali. SAGCOT is expected to become a hub that attracts both private and public sector investment; hence involvement of both men and women in the management of natural resources (mainly land and water) is crucial in the study area and in Tanzania at large.

1.1 The Theoretical Framework

This paper is based on the Feminist environmentalism theory as suggested by popular researchers **[3]**. The theory advocates the link between women and the environment and that this relationship should be structured by a given gender/class. If the environment on which women depend for their survival is qualitatively and quantitatively degraded, it will in turn affect other opportunities needed for the management of natural resources and thus, restrict other development options. Women are regarded as the gate keepers of natural resources (land and water) as important resources for agriculture. It is also believed that there is a close relationship between natural resources and women's role of acquiring food and water for their family, therefore women possess more knowledge on the management of land and water than men **[6]**. Despite this expertise, the control over land and water lies in the hands of men.

Moreover, women lack representation in the decision-making over land and water due to social and cultural norms. Studies indicate further that, when land gains an economic value, its demand increases and therefore it becomes a scarce resource which is controlled by men **[7]**. It is argued that when land and water are freely available, women can have access to and control over them, however, when the value for land is high women lose the control over land and water **[8]**. It is therefore advocated that women should have control over natural resources especially in area where there is high agricultural investment such as the SAGCOT area in Tanzania.

In view of this, planning for the utilization of natural resources in the SAGCOT area has to consider women's traditional roles as care givers otherwise their livelihood security and that of those under their care will be compromised. Moreover, other researchers have reported that despite the anticipated benefits of the transformation of local communities, agricultural production and the life of some communities in the cluster have been negatively affected, hence their liability to move from subsistence to a cash-based agricultural economy **[8]**. Therefore, this paper aims at answering the following questions: i) Are women involved in decision-making on issues related to natural resources? And ii) Do women and men have equitable access to and control over land and water in the SAGCOT area?

2. Methodology

2.1 Description of the study area

The study was conducted in the Ihemi cluster of the SAGCOT area. The Ihemi cluster covers two regions namely; Iringa and Njombe (**Figure 1**). The Ihemi Cluster is located in the eastern-most part

of the southern highlands. The exact geographical boundaries have not been delineated, but according to SAGCOT Centre, the cluster is located in the two regions of Iringa and Njombe. These regions form part of the Southern Highlands Zone of Tanzania Mainland which comprises the Ruvuma, Iringa, Njombe, Mbeya, Katavi, Rukwa Regions and part of Morogoro Region. The regions are located between latitudes 6°30′ and 11°0′ south of the Equator, and between longitudes 33°30′ and 37°0′ east.

2.2 Sampling procedure

i) Selection of study wards and villages

Five districts of Mufindi District Council, Kilolo DC, Iringa DC, Wanging'ombe and Njombe DCwere purposefully selected because they make up the Ihemi agricultural cluster. Study wards and villages were also purposefully selected using the following criteria: their location along the landscape, presence of investors, potential for agriculture expansion, high number of Female Headed Household (FHH), and presence of partners in the area, for instance presence of MVIWATA representatives. Five districts were selected from the two regions. District councils selected from Iringa region were Kilolo, Mufindi and Iringa, while Wanging'ombe and Njombe were from Njombe region. Four villages were randomly selected from each district.

ii) Selection of Households

Households were stratified into three groups based on their wealth categories (Low, Medium and High) using a criteria set at the village level. The stratification was done in a manner that all gender groups (men, women, youth, female headed and disabled) were represented. In each wealth stratum, random selection of households was carried out to obtain the sample. However, households with people with disability were purposefully selected because of their limited number. Female headed households were purposefully selected such that for each wealth category, at least four respondents had to be from female headed households. Ten households were selected from each wealth category making a total of 30 households per village. In each selected household, the head of the household was considered as the key respondent.

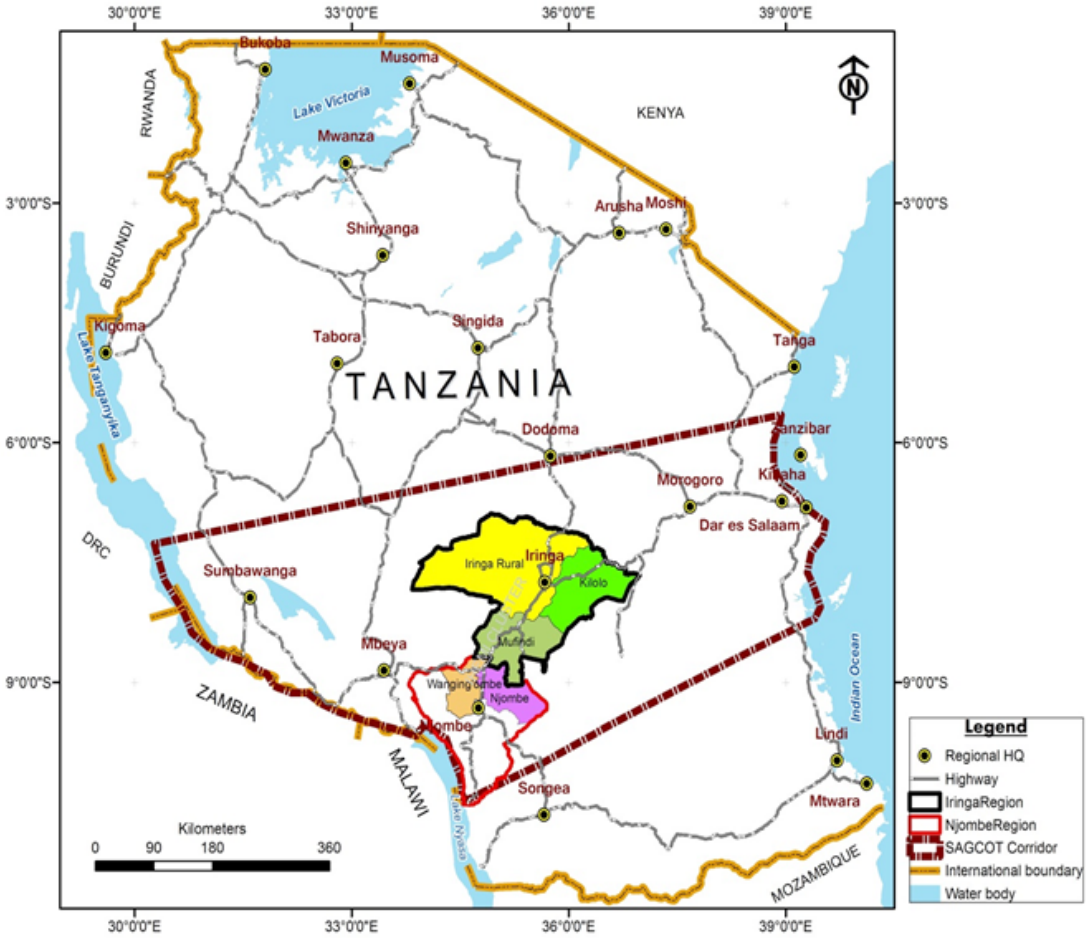

Figure 1: Map of Tanzania indicating Ihemi Agricultural cluster

2.3 Data collection

i) Questionnaire administration

Prior to data collection, enumerators were familiarized with the data collection tool. The face-to-face survey questionnaire was administered to respondents at their homes. In cases where the household head was not at home, a replacement from the same wealth category was chosen. In each village, at least 30 households were surveyed. In total 607 respondents were visited in twenty villages within five study districts. Five villages were surveyed in Iringa DC (n=167), four villages in Kilolo (n=119), three villages in Mufindi (n=90), four villages in Wanging'ombe (n=120), and four villages in Njombe (n=111).The variation in village numbers and the sample size per district reflect the size of the district in question and the population size. Generally the variation aimed to capture the diversity represented by villages within the districts.

ii) Focus Group Discussions (FDG)

In each village, one focus group discussion was conducted. In total, 18 focus group discussions were conducted. Group discussants were purposefully selected based on their roles in the village (Village Government leaders, Ward, Religious, Farmer group representatives, representative of all gender groups). Each focus group had about 6–12 people.

iii) Key informant Interviews

Key informant interviews were conducted to selected local government officials, investors, government programs (e.g. MUVI), NGOs (e.g. MVIWATA) and SAGCOT Centre. It was necessary to conduct key informant interviews to allow triangulation of information obtained from focus group discussions and questionnaires.

2.4 Data analysis

2.4.1 Qualitative data analysis

Audio recorded information from Key Informant (KIs) interviews and FGDs were transcribed and organized into meaningful subthemes. Thereafter, the information was analyzed through content analysis of the transcribed data, carried out using Excel spreadsheets. Using excels, data were first sorted into themes and later patterns were generated across themes to show relationships across key issues such as gender groups, farm size and village.

2.4.2 Quantitative analysis

Quantitative data were coded and analyzed using SPSS. Data cleaning was performed to ensure that data values were complete, accurate and correct. Descriptive analysis and cross-tabulation were conducted to draw inferences on the collected data in response to the study objectives.

3. Results

3.1 Social demographic characteristics

3.1.1 Marital status and Sex of the household head

Observations from the study show that the majority (76.7 %) of respondents in Mufindi district were married, followed by Kilolo (68.9 %) and Njombe (62.2 %) districts. The reason given by FGD participants for the trend, apart from continuation of the generation, was that married couples are respected in African societies, Tanzania included. Very few respondents (2.5 %) in Wanging'ombe district never married and very few had divorced (2.2 %) in Mufindi district. Further, findings indicate that the number of female-headed households was slightly higher in Njombe district (33 %) followed by Wanging'ombe (32.5 %), Iringa Rural district (25.7 %), Kilolo (25.2 %) and least in Mufindi (20 %) (**Table 1**).

Several reasons were attributed to the increase in FHH in the area including death of spouses due to HIV/AIDS and divorce/separation. This is in line with studies conducted in Njombe region **[9]** which found that the rate of HIV was high in Makete, which is one of the districts in Njombe, thus leading to high numbers of FHH. When asked about the reason for more men dying from HIV/AIDS, a participant in one of the focus group discussions said:

"....A majority of men do not want to go for HIV/AIDS testing, when it is realized that they are HIV/AIDS positive, it will be too late. Again when they realize about their HIV/AIDS status and they are required to take ARVs drugs, they do not abide by the instructions given by health workers. For instance, they do not take the drugs on a daily basis. In addition, they do not reduce their sexual contacts....." (A female FGD discussant, Boma la Ng'ombe Village).

On the other hand, the percentage of widows is increasing as compared to widowers. This is because the majority of widows do not prefer re-marriage after the death of the husband, unlike men who marry soon after the death of the wives. For the HIV/AIDS positive, remarrying increases number of new HIV/AIDS infections, and therefore increases the prevalence rate and orphans in the country **[9]**, **[10]**. It is culturally accepted that men cannot tolerate loneliness (staying without a wife) while women are believed to withstand loneliness (staying without a husband) **[11]**.

Looking at the trend, a relatively high proportion of respondents (8.4 %) in the Iringa rural district were single, they had never married. The rate of single people is increasing around the globe and Tanzania is no exception. The majority of women in sub-urban areas are aware of their rights and hence they opt not to marry, especially when they see fellow married women suffering in violent marriages.

It was noted that there are many young men remaining as older bachelors due to poor economic status. One of the young men said:

"You cannot dare get married while you do not have a reliable income to feed the family. For instance I am currently depending on my mother, how can I marry?" FGD participant in Iringa District Council.

Table 1: Marital status, Sex of household head, Household size & Education (n=607)

Attribute		Iringa region			Njombe region	
		Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'o DC
		(n =167)	(n=119)	(n =90)	(n = 111)	(n =120)
Marital status	Married	111 (66.5)	82 (68.9)	69 (76.7)	69 (62.2)	80 (66.7)
	Never Married	-	-	1 (1.1)	1 (0.9)	3 (2.5)
	Divorced	14 (8.4)	4 (3.4)	1 (1.1)	4 (3.6)	2 (1.7)
	Separated	2 (1.2)	1 (0.8)	1 (1.1)	1 (0.9)	2 (1.7)
	Widow	38 (22.8)	26 (21.8)	15 (16.7)	30 (27)	28 (23.3)
	Widower	1 (0.6)	5 (4.2)	1 (1.1)	4 (3.6)	3 (2.5)
Sex of respondents	Male	124 (74.3)	89 (74.8)	72 (80)	74 (66.7)	81 (67.5)
	Female	43 (25.7)	30 (25.2)	18 (20)	37 (33.3)	39 (32.5)
Household Size	1 – 5	23 (13.8)	73 (61.3)	58 (64.4)	76 (68.5)	83(69.2)
	6 – 10	134 (80.2	45 (37.8)	31 (34.4)	35 (31.5)	37 (30.8)
	11 – 15	7 (4.2)	1 (0.8)	1 (1.1	-	-
Education level	None	23 (13.8)	13 (10.9)	5 (5.6)	8 (7.2)	14 (11.7)
	Primary	134 (80.2)	99 (83.2)	80 (88.9)	100 (90.1)	104 (86.7)
	Secondary	7 (4.2)	3 (2.5)	4 (4.4)	3 (2.7)	1 (0.8)
	College	3 (1.8)	4 (3.4)	1 (1.1)		1 (0.8)
	University	-	-	-	-	-

NB: Number in brackets indicate percentage

3.1.2 Education level of respondents

Based on **Table 1**, the majority (90.1 %) of respondents in Njombe, 88.9 % in Mufindi and 86.7 % in Wanging'ombe district had a primary school level of education. Very few had attained college level education (e.g. 3.4 % in Kilolo District) with none having a university degree. The reason for this trend was that primary school is compulsory and it is provided for free (the government is subsidizing the costs, therefore parents taking their children to school do not have to pay). Surprisingly, a good proportion of respondents (13.8 %) and (11.7 %) in Iringa Rural and Wanging'ombe respectively had no education at all. It was noted that in some of the villages, e.g. Makifu in Iringa District, students had to walk several kilometers to access government owned ward secondary schools in nearby villages where costs are relatively low compared to private ones. However, these schools lack the capacity to accommodate all primary school leavers. This could be a reason for some of the students not acquiring their secondary education. The lack of formal education is likely to slow down the process of communities acquiring knowledge through reading various sources of information such as brochures, newspapers and even handouts given during trainings. The majority (69.2 %, 68.5 %, 66.5 %, 64.4 % and 61.3 %) of respondents in Wanging'ombe, Njombe, Iringa DC, Mufindi and Kilolo Districts, respectively, indicated that they have 1-5 household members (**Table 1**).

3.1.3 Age of respondents

In terms of the age of respondents, the findings presented in **Table 2** show that a good proportion of 35.6 % and 29.4 % of the respondents in Mufindi and Kilolo districts, respectively, were aged between 40-49 years. Implying that the majority was young and in their active reproductive age, these are expected to work hard in their fields and to able to apply the new technologies available to them through investors. The findings are in line with the National Population census of 2012 that the majority of people in Tanzania are still young **[12]**. Moreover, they are confident enough to interact with the investors available in the area and therefore the possibility of learning new technologies.

Table 2: Age of respondents

Attribute		Iringa region			Njombe region	
		Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'ombe DC
		(n =167)	(n=119)	(n =90)	(n = 111)	(n =120)
Age groups	20 – 29	18 (10.8)	12 (10.1)	6 (6.7)	12 (10.8)	8 (6.7)
	30 – 39	35 (20.9)	30 (25.2)	11 (12.2)	22 (19.8)	20 (16.7)
	40 – 49	41 (24.6)	35 (29.4)	32 (35.6)	29 (26.1)	28 (23.3)
	50 – 59	31 (18.6)	24 (20.2)	20 (22.2)	23 (20.7)	33 (27.5)
	60 and above	42 (25.1)	18 (15.1)	21 (23.3)	25 (22.5)	31 (25.8)

NB: Number in brackets indicate percentage

3.2 Land and water Ownership and Use by Gender

Access and control over production resources was assessed. The term access was defined as a situation in which a person is allowed to use a resource such as land for growing crops without having control over it **[13]**. On the other hand control allows a person to make decisions on who uses the resource or on disposing it, for instance selling it. Nonetheless, women's rights to land mainly depend on their relationship with men and therefore they have the right to use it only as wives, sisters and daughters. They lack the ability to make any decision on selling, hiring or changing its use **[14]**. From the findings, women's access to land and water resources was relatively higher compared to men (**Table 3**). Generally, married women are obliged to work hard in agriculture in order to feed their families; men prefer cash and horticultural crops which have higher financial returns. **Table 3** shows that women with control over land accounted for 23.9 % and 19.3 % in Iringa and Kilolo Districts, respectively. During focus group discussions in some of the villages in Iringa District it was revealed that some of the women are assigned a piece of land when they get married. However, this piece of land is also controlled by the husband. According to **Table 3** the proportion of males with control over land accounted for 40.3 % and 45.1 % for Kilolo and Iringa Districts, respectively.

Table 3: Access to & Control over Land and Water Resources (n=607)

Attribute		Iringa region		Njombe region		
		Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'o DC
		(n =167)	(n=119)	(n =90)	(n = 111)	(n =120)
Access to land and water	Female Child	-	-	2 (2.9)	2 (2.3)	-
	Male Child	-	-	-	-	-
	Male Adult	13 (10.4)	8 (10.4)	7 (10.3)	10 (11.4)	4 (5.5)
	Female Adult	41 (32.8)	24 (31.2)	18 (26.5)	26 (29.5)	23 (31.5)
	M & Female Adult	71 (56.8)	45 (58.4)	41 (60.3)	50 (56.8)	46 (63.0)
Control over land and water	Female & Male Child	6 (2.2)	2 (1.0)	4 (2.6)	-	-
	Male Adult	110 (40.3)	88 (45.1)	64 (41.6)	60 (34.1)	61 (33.7)
	Female Adult	80 (29.3)	41 (21.0)	28 (18.2)	51 (29.0)	50 (27.6)
	Male &Female Adult	77 (28.2)	64 (32.8)	58 (37.7)	65 (36.9)	70 (38.7)

NB: Number in brackets indicate percentage

3.2.1 Land Acquisition and Rights

Respondents were asked to state whether they had the right of occupancy over the land they own. Results in **Table 4** show that very few (2.8 %) respondents in Iringa rural district had an offer of the right of occupancy. Focus group discussants lamented the procedures for obtaining the offer of the right of occupancy, saying it was very tedious and the system was very corrupt. In Wanging'ombe District, the majority (83.4 %) of farmers had no formal document for their land. This could be due to the District being new as it was officially established in 2012 and many things are yet to be put into order to allow the capturing of relevant information. According to **Table 4**, 82.9 %, 78.2 % and 75.2 % of respondents in Mufindi, Kilolo and Njombe Districts, respectively, had no official documents for their land, thus limiting them to use the same as collateral to access loans from formal financial institutions **[15]**. It has been found that rural subsistence farmers become more productive and increase investment in agriculture if they are provided with the formal land titles **[16], [17]**.

Table 4: Land ownership document (n=607)

Land ownership document	Iringa Region			Njombe Region	
	Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'ombeDC
	n=167	n=119	n=90	n=111	n=120
Right of Occupancy	11 (2.8)	5 (1.6)	-	5 (1.9)	2 (0.6)
No document	260 (66.3)	248 (78.2)	189 (82.9)	197 (75.2)	296 (83.4)
Title deed	25 (6.4)	21 (6.6)	12 (5.3)	7 (2.7)	2 (0.6)
Village government document	35 (8.9)	28 (8.8)	18 (7.9)	28 (10.7)	17 (4.8)

3.2.2 Time taken to access farms

Based on the results presented in **Table 5**, the majority of farmers had no means of transport to their farms and therefore they access their farms on foot. It was worth identifying the time taken to access their farms. The findings presented in **Table 5** show a good proportion of farmers (25.2 %, 21 %, and 20.6 %), in Mufindi, Njombe and Wanging'ombe, respectively, have their farms near their homestead and hence take a negligible amount of time (1-5 minutes) to access them. However, these farms are relatively small in size and their total production is low. Nonetheless, the majority of respondents (60.4 %, 41.4 %, 37.6 % and 36.8 %) from Iringa Rural, Wanging'ombe, Mufindi and Kilolo districts take 31-60 minutes to access their farms; details are shown in **Table 5**. The findings concur with other studies **[16]** which contend that the farm size increases with distance to the farm, the larger the farm the longer the distance from home to the farm.

Table 5: Time taken to access the household's farm(s) in Ihemi cluster (n=607)

Attribute		Iringa region			Njombe region	
		Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'o DC
		(n =167)	(n=119)	(n =90)	(n = 111)	(n =120)
Time taken to access farms	0	48 (12.2)	45 (14.3)	57 (25.2)	55 (21.0)	73 (20.6)
	1 – 30	238 (60.4)	116 (36.8)	85 (37.6)	87 (33.2)	147 (41.4)
	31 – 60	75 (19.0)	83 (26.3)	62 (27.4)	62 (23.7)	89 (25.1)
	61 – 90	21 (5.3)	21 (6.7)	8 (3.5)	23 (8.8)	21 (5.9)
	91 – 120	10 (2.5)	28 (8.9)	9 (4.0)	18 (6.9)	16 (4.5)
	121 and above	2 (0.5)	22 (7.0)	5 (2.2)	17 (6.5)	9 (2.5)

3.2.3 Land acquisition by households

Respondents were asked to indicate how the land they own was acquired. **Table 6** shows that with the exception of Iringa district the majority of respondents (i.e. ranging from 60.5 % to 75.1 %) in the study area inherited their land from their parents or were given it as a gift by their relatives. However, for Iringa the majority (54.4 %) acquired their land through purchase and this could be due to the fact that the District is closer to Iringa Municipality where most of the people are aware of the value and importance of purchasing surveyed land. Generally, the results show that very few respondents (6.0 %) acquired land through village government across the districts in the Ihemi cluster. Furthermore, a good proportion of the respondents acquired land from year 1991 to 2010 (**Table 6**).

Table 6: Land Acquisition in the study area

Attribute		Iringa Region			Njombe District	
		Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'ombe DC
Mode of acquisition	Cleared	4 (1.3)	2 (0.7)	-	-	-
	Purchased	173 (54.4)	93 (32.0)	62 (28.3)	47 (20.1)	57 (18.0)
	Inheritance/Bequest	117 (36.8)	176 (60.5)	145(66.2)	172(73.5)	238 (75.1)
	Village government	24 (7.5)	20 (6.9)	12 (5.5)	15 (6.4)	22 (6.9)
Acquisition year	< 1960	11 (3.5)	1 (0.3)		3 (1.3)	4 (1.3)
	1960 – 1970	17 (5.3)	11 (3.8)	5 (2.3)	22 (9.4)	16 (5.0)
	1971 – 1980	38 (11.9)	33 (11.3)	23 (10.5)	36 15.4)	34(10.7)
	1981 – 1990	50 (15.7)	61 (21.0)	52 (23.7)	32 (13.7)	71 (22.4)
	1991 – 2000	86 (27.0)	53 (18.2)	69 (31.5)	38 (16.2)	75 (23.7)
	2001 – 2010	68 (21.4)	69 (23.7)	44 (20.1)	59 (25.2)	65 (20.5)

3.2.4 Values of owned and rent-out parcels

Generally, the results in **Table 7**show that the majority of respondents (70.3 %, 67.1 %, 65.8 %, 60.8 % and 59.1 %) from Mufindi, Wanging'ombe, Njombe, Kilolo and Njombe, respectively, revealed that the value of their land was less than 600,000 (approx.US$ 276). A good proportion of respondents (21.7 %) in Iringa District council indicated the value above 3,600,000 (approx. US$ 1658) on their parcels (**Table 7**). This is because the value of land in Iringa is higher as compared to other districts because Iringa DC is just near Iringa Municipal where the value of land is higher due to urbanization. Rent value for plots of land ranged between Tsh. 20,000 – 90,000. However, very few individuals rented land. In addition, land owned by households was mostly used for agriculture and residential, however, over 85% of all the land was allocated to agriculture.

Table 7: Values of owned and rent-out parcels

Attribute		Iringa region			Njombe region	
		Iringa DC	Kilolo DC	Mufindi DC	Njombe DC	Wanging'o DC
		(n =167)	(n=119)	(n =90)	(n = 111)	(n =120)
Parcel value in Tshs	> 600,000	188 (59.1)	177 (60.8)	154 (70.3)	154 (65.8)	213 (67.1)
	600,000–1,199,999	53 (16.6)	64 (22.0)	35 (16.0)	50 (21.3)	68 (21.4)
	1,200,000 –1,799,999	5 (1.6)	5 (1.7)	4 (1.9)	7 (3.0)	8 (2.5)
	1,800,000 –2,399,999	1 (0.3)	7 (2.4)	8 (3.7)	4 (1.7)	17 (5.3)
	2,400,000 –2,999,999	1 (0.3)	4 (1.4)	2 (0.9)	2 (0.9)	2 (0.6)
	3,000,000 –3,599,999	1 (0.3)	2 (0.7)	5 (2.3)	1 (0.4)	2 (0.6)
	3,600,000 and above	188 (59.1)	32 (11.0)	11 (5.0)	16(6.8)	7 (2.2)
Rented value in Tshs	< 20,000	15 (4.7)	9 (3.1)	15 (6.8)	19 (8.1)	12 (3.8)
	20,000 – 50,000	160 (50.3)	152 52.2)	123 (56.2)	114 (48.7)	193 (60.9)
	60,000 – 90,000	54 (17.0)	41 (14.1)	18 (8.2)	44 (18.8)	43 (13.6)
	100,000 – 130,000	28 (8.8)	34 (11.7)	31 (14.2)	27 (11.5)	37 (11.7)
	140,000 – 170,000	14 (4.4)	11 (3.8)	11 (5.0)	9 (3.8)	9 (2.8)
	180,000 – 210,000	14 (4.4)	19 (6.5)	7 (3.2)	8 (3.4)	13 (4.1)
	220,000 and above	33 (10.4)	25 (8.6)	14 (6.4)	13 (5.6)	10 (3.2)

NB: Number in brackets indicate percentage

3.2.5 Decision-making over assets (Land, Livestock and House)

Decision-making on the sale, rent and purchase of assets such as livestock and houses is done by men in all the districts. Nevertheless, for Wanging'ombe district, half of respondents (50 %) argued that women can only make a joint decision with the husband on the purchase of livestock and land (**Table 8**). However, during the FGDs, participants pointed out that a man can seek advice from his wife, while final decisions are made by the husband. Therefore, decision-making over major assets is made by men.

3.2.6 Participation in the management of Natural Resource Use

Generally, knowing the proportion of men and women involved in the management of natural resources is important in order to ensure sustainable development. The results in **Table 9** show that the majority (77.8 %) in Iringa DC and more than two thirds (76.7 %) of the respondents from Wanging'ombe Districts agreed that women are involved in various committees related to natural resource management. Moreover, almost half of all the surveyed respondents in the Ihemi cluster agreed that women are knowledgeable on natural resource management, and that based on their gender roles, women provide basic needs for the family.

3.3 Households' Access to Water

Access to water is an indicator related to livelihood improvement. Respondents were asked to mention their nearest sources of water. With reference to **Table 10**, the majority of respondents had the opinion that 61.7 %, 46.8 %, 44.5 %, 42.1 % and 38.9 % of respondents in Wanging'ombe, Njombe, Kilolo, Iringa rural and Mufindi, respectively, use shared tap water. In some of the villages such as Ivigo, the distance to one tap is less than 100 meters while in other villages the distance was 100 meters or more. However, during the FGDs in one of the villages, the discussants revealed that the village had other water sources owned by Roman Catholic missionaries in addition to the government provided sources. Generally, access to tap water enhances working efficiency and reduces workload among women, particularly due the domestic chores assigned to them. The only challenge with shared tap water is the management of the taps as it was observed in Ivigo village that the corks were out of use and nobody was responsible of replacing them. Although village and ward leaders were aware they were also not responsible and therefore water was flowing without any control. No one feels responsible when it comes to replacing broken corks or broken pipes. Ward and village leaders were less concerned. In improving the tap water network, Roman Catholic missionaries have also constructed a water source in Boma la Ng'ombe village, Kilolo District. In showing appreciation to the above one FGD participant said:

"*We are very thankful to the Roman Catholic missionaries for constructing water sources in our village as we are now getting water in our vicinity. Our women are now happy...*"

A good proportion of respondents (12.6 % and 12.5 %) (**Table 10**) in Iringa and Wanging'ombe districts, respectively, had water piped into their houses. This is an indicator of improved livelihood for the people in the two regions as one cannot use piped water without having modern houses **[17]**. Nonetheless, most of the villages with water piped into the house are those near to urban areas such as Kilolo and Ihemi villages of Kilolo and Iringa district councils. Availability of water in the area is one of the attractions for investment in agriculture. A good number of investors are currently working in Ihemi village, such as Silverlands, which is keeping poultry, while Sembe Tofauti is buying maize from farmers for flour milling.

3.3.1 Responsibility for fetching water for domestic use

In most Tanzanian communities women and girls are responsible for fetching water for domestic use and sometimes for watering the animals. The above is also the tradition for many other African countries. Results in **Table 10** show that about two fifths of the respondents in Wanging'ombe, Kilolo and Njombe districts revealed that adult women were responsible when it comes to fetching water for domestic use and that although anyone in the household can be involved, normally it is the adult women who take the leading role. Boys and girls normally assist but most of them are still in school. However, adult men fetch water when there is a possibility of making money (*i.e.* if they can sell the water). The observation conforms to what has been reported by other researchers **[17]** that during acute water shortage, adult men fetch water using bicycles and sell it to earn income.

Table 8: Decision-Making over Household Assets (Land, Livestock and House) (n = 607)

	Iringa Region									Njombe Region					
	Iringa (n_I= 167)			Kilolo (n_K = 119)			Mufindi (n_M = 90)			Njombe (n_N = 111)			Wanging'ombe (n_W = 120)		
Parameter	MA	FA	M&FA	MA	FA	M&FA	MA	FA	M&FA	MA	FA	M&FA	MA	FA	M&FA
Land Sale	85 (50.9)	39 (23.4)	43 (25.7)	47 (39.5)	27 (22.7)	45 (37.8)	52 (57.7)	12 (13.3)	26 (28.9)	56 (50.4)	15 (13.5)	40 (36.0)	62 (51.6)	18 (15.0)	40 (33.3)
Land Purchase	94 (56.3)	28 (16.7)	45 (26.9)	40 (33.6)	26 (21.8)	53 (44.5)	27 (30.0)	19 (21.1)	44 (48.9)	34 (30.6)	30 (27.0)	47 (42.3)	31 (25.8)	29 (24.2)	60 (50.0)
Land Rent	72 (43.1)	30 (18.0)	65 (38.9)	46 (38.7)	26 (21.8)	47 (39.5)	34 (37.8)	19 (21.1)	37 (41.1)	39 (35.1)	29 (26.1)	43 (38.7)	36 (30.0)	29 (24.2)	55 (45.8)
Livestock Sale	65 (38.9)	38 (22.8)	64 (38.3)	44 (37.0)	24 (20.2)	51 (42.9)	33 (36.7)	19 (21.1)	38 (42.2)	36 (32.4)	31 (27.9)	44 (39.6)	34 (28.3)	26 (21.7)	60 (50.0)
Livestock Purchase	57 (34.1)	34 (20.4)	76 (45.5)	36 (30.3)	23 (19.3)	60 (50.4)	21 (23.3)	19 (21.1)	50 (55.6)	26 (23.4)	28 (25.2)	57 (51.4)	28 (23.3)	26 (21.7)	66 (55.0)
Livestock Rent	64 (38.3)	37 (22.2)	66 (39.5)	42 (35.3)	24 (20.2)	53 (44.5)	31 (34.4)	19 (21.1)	40 (44.4)	30 (27.0)	29 (26.1)	52 (46.8)	31 (25.8)	26 (21.7)	63 (52.5)
House Sale	102 (61.1)	25 (14.9)	40 (24.0)	45 (37.8)	26 (21.8)	48 (40.3)	35 (38.9)	19 (21.1)	36 (40.0)	47 (42.3)	32 (28.8)	32 (28.8)	37 (30.8)	29 (24.2)	54 (45.0)
House Purchase	64 (38.3)	36 (21.6)	67 (40.1)	34 (28.6)	25 (21.0)	60 (50.4)	24 (26.7)	19 (21.1)	47 (52.2)	33 (29.7)	33 (29.7)	45 (40.5)	29 (24.2)	29 (24.2)	62 (51.7)
House Rent	70 (41.9)	39 (23.4)	58 (34.7)	47 (39.5)	26 (21.8)	46 (38.7)	32 (35.6)	19 (21.1)	39 (43.3)	39 (35.1)	33 (29.7)	39 (35.1)	33 (27.5)	29 (24.2)	58 (48.3)

NB: Numbers in the brackets indicate percentages MA: Male adult, FA: Female adult, M & FA: Male and Female adult

Table 9: Women participation in Natural Resource Use

Attribute	Response	Iringa Region			Njombe Region	
		Iringa DC (n_I = 167)	Kilolo DC (n_K = 119)	Mufindi DC (n_M = 90)	Njombe DC (n_N = 111)	Wanging DC (n_W = 120)
Women are involved in NR committee	Agree	130 (77.8)	78 (65.5)	65 (72.2)	84 (75.7)	92 (76.7)
	Disagree	37 (22.2)	41 (34.5)	25 (27.8)	27 (24.3)	28 (23.3)
Women Participate in setting Norms & Regulation	Agree	115 (68.9)	83 (69.7)	68 (75.6)	87 (78.4)	93 (77.5)
	Disagree	52 (31.1)	36 (30.3)	22 (24.4)	24 (21.6)	27 (22.5)
Women Benefit equally with Men over NR products	Agree	64 (38.3)	42 (35.3)	34 (37.8)	41 (36.9)	50 (41.7)
	Disagree	103 (61.7)	77 (64.7)	56 (62.2)	70 (63.1)	70 (58.3)
Women are knowledgeable about NR conservation	Agree	91 (54.5)	53 (44.5)	48 (53.3)	66 (59.5)	67 (55.8)
	Disagree	76 (45.5)	66 (55.5)	42 (46.7)	45 (40.5)	53 (44.2)
Women are involved in Conflict Resolution over the use of NR	Agree	123 (73.7)	83 (69.7)	64 (71.1)	85 (76.6)	95 (79.2)
	Disagree	44 (26.3)	36 (30.3)	26 (28.9)	26 (23.4)	25 (20.8)
Women are involved in Marketing NR products	Agree	64 (38.3)	42 (35.3)	33 (36.7)	40 (36.0)	43 (35.8)
	Disagree	103 (61.7)	77 (64.7)	57 (63.3)	71 (64.0)	77 (64.2)

NB: Numbers in the brackets indicate percentages NR = Natural Resources

Table 10: Water Sources in the Ihemi Cluster

Attribute		Iringa DC (n =167)	Kilolo DC (n=119)	Mufindi DC (n =90)	Njombe DC (n = 111)	Wanging'o DC (n =120)
Water sources	Bought water	0 (0)	1 (0.8)	0 (0)	0 (0)	0 (0)
	Shared tap	72 (42.1)	53 (44.5)	35 (38.9)	52 (46.8)	74 (61.7)
	Piped in house	21 (12.6)	13 (10.9)	6 (6.7)	8 (7.2)	15 (12.5)
	Tap in yard	20 (12)	8 (6.7)	3 (3.3)	9 (8.1)	16 (13.3)
	Piped outside	18 (10.8)	14 (11.8)	9 (10)	7 (6.3)	4 (3.3)
	River	3 (1.8)	4 (3.4)	4 (4.4)	8 (7.2)	1 (0.8)
	Stream	9 (5.4)	12 (10.1)	5 (5.6)	6 (5.4)	3 (2.5)
	Spring	11 (6.6)	4 (3.4)	2 (2.2)	2 (1.8)	2 (1.7)
	Borehole	8 (4.8)	3 (2.5)	8 (8.9)	2 (1.8)	1 (0.8)
	Hand pump	0 (0)	-	11 (12.2)	12 (10.8)	3 (2.5)
	Covered tube well	5 (3)	-	7 (7.8)	5 (4.5)	1 (0.8)
	Uncovered tube well	0 (0)	1 (0.8)		0 (0)	0 (0)
Who fetches water for domestic use?	All HH	54 (32.3)	31 (26.1)	26 (28.9)	31 (27.9)	32 (26.7)
	Girls	2 (1.2)	2 (1.7)	3 (3.3)	4 (3.6)	1 (0.8)
	Adult women	56 (33.5)	47 (39.5)	29 (32.3)	43 (38.7)	49 (40.8)
	Girls & adult women	33 (19.8)	31 (26.1)	24 (267.7)	25 (22.5)	31 (25.8)
	Boys	4 (2.4)	1 (0.8)	2 (2.2)	0 (0)	3 (2.5)
	Adult men	10 (6)	6 (5)	4 (4.4)	4 (3.6)	3 (2.5)
	Boys & adult men	2 (1.2)	0 (0)	0 (0)	0 (0)	0 (0)

4. Discussion

4.1 Land and water resource ownership and use

In Tanzania, the customary rights of water are closely related to land rights. Therefore, women tend to lose customary water rights along with land rights. Lack of ability to own land among women is due to many factors including the customary laws that discriminate women. As reported, women under traditional norms have no rights to acquire land because of fear of transferring the land to another clan when they get married **[18]**. The assumption is that girls and women would acquire land through their husband. Based on Tanzania's land policy of 1995 and the Village Land Act No 5 of 1999, women were expected to secure land through purchase; however, thought the Land Law is in force **[19]**, the majority of women in rural areas generally lack this security. The vast majority of women cannot afford to buy land and usually can only access land through male relatives, which makes their security of tenure dependent on good marital and family relations **[14]**.

4.2 Land and water acquisition and Rights

As land becomes scarce and acquires economic value, a demand for more personal and formalized land ownership rights increases **[7]**. This is happening in Tanzania and more specifically in the SAGCOT area. Despite the fact that Tanzania's Land Act No 5 of 1999 is operating, the Act categorically states that an individual could be offered a certificate of customary right of occupancy (CCRO) as an official document **[19]**, yet the majority of people in these districts do not have a CCRO. Though the findings here concur with other studies **[14]** who reported a similar scenario for Tarime District, they however contradict the wishes of Tanzania Investment Bank **[15]**. Communities are sensitized to invest in agriculture after accessing loans from TIB; however, they must have collateral. Therefore, there is a general need for creating awareness among rural communities to seek their CCRO. Similarly, in SAGCOT areas where there are many local and international investors in agriculture, acquisition of a CCRO would assist vulnerable groupds such as widows and women at large to own land and water.

4.3 Decision-making

It is widely known that ownership of resources goes hand in hand with an individual's decision-making power. Decision-making over three important assets was assessed; these were land, house and livestock. The result conforms to other study reports **[20]** whereby women in the Serengeti District had no control over land. The reason for not engaging women in such important decision-making was given as lack of "agency" among them. Agency is defined as the "ability to define one's goals and act upon them" **[21]**. Women's agency is mainly measured in terms of how they participate in household decision-making. Society would want to see women's ability to make decisions autonomously improved to be able to trust them.

4.4 Women participation in the management of land and water

It is widely known that women are the care givers; they manage natural resources daily as farmers. Being homemakers, women and girls walk very long distances to collect fuel wood and water. Women also use medicinal plants for sick family members. Different types of food such as wild fruits and plants available in the forest are known by women. Women are involved in weaving baskets using raw materials such as reeds and bamboo trees found in the forest, women are also involved in making crates/baskets (used for carrying tomatoes). They also sell local brew made from bamboo trees.

Despite the importance of natural resources to women, the majority (70 % to 77 %) of the respondents from Kilolo, Njombe and Wanging'ombe districts, respectively, contend that women do not benefit equally with men in relation to the high value natural resource products such as timber **[3]**; **[1]**. This can partly be supported by the fact that though Njombe and Iringa are Tanzania's main timber producers only one third of the surveyed respondents agreed that women are involved in timber marketing.

5. Conclusions and Recommendations

Based on the findings, it can be concluded that a substantial number of households are headed by females due to high prevalence of HIV/AIDS in the Southern part of Tanzania in which the Ihemi SAGCOT Agricultural cluster is situated. Being female heads of the household, their vulnerability to the negative impact of the unsustainable use of natural resources is also high. From the findings, ownership of land by women depends on their relationship with men, thus widows and divorced women may lose their rights through land grabbing in areas with large investment under SAGCOT. Some of the opportunities such as the ability to access credit for more investments will be at stake due to the lack of secure land rights. Poor rural women are solely dependent on common property resources for fuel wood, food and water, and thus depletion of the common property resources causes severe threat to their livelihood. To plan sustainably, planners should consider the most vulnerable groups of people such as women.

Similarly, when poor women and men are ensured of secure ownership of land and water, they are more likely to make environmentally sound land management decisions. The lack of control and particularly that of land jeopardizes women's ability to improve their livelihoods' as most of them are dependent on agriculture. It is further concluded that in the Ihemi SAGCOT agricultural cluster the households' lack of awareness and the accompanying hurdles for obtaining a certificate of customary rights of occupancy (CCRO) has resulted in only a few households owning such a document. Consequently, many households have failed to use the land they own as collateral to access credit from formal financial institutions.

As women's livelihood depends on agriculture, involvement in decisions making over land and water, mainly water for irrigation, would improve agricultural productivity and conservation of the ecosystem. Poor rural women farmers have limited access to irrigation networks and they cannot make irrigation management decisions. In most cases, water user associations link water resource ownership to land ownership. In so doing women's limited water entitlements forces them to use subsistence agricultural practices that may lead to various unfriendly agricultural practices such as cultivating in wet land commonly known as vinyungu, a major source of instability in watersheds. It is recommended that women be involved in decision-making to be able to utilize water in a sustainable manner.

Commercialization of agriculture, driven partly by global trade in high-yield crops such as Njombe under SAGCOT, is believed to be responsible for the rapid decline in agrobiodiversity, which threatens local production and thus causes food insecurity. Knowing further that the strategic and practical gender needs of men and women are different, it is recommended that development actors including research institutions should take into account the impact of projects on women separately from the entire household. This is because households are not homogenous. This would be possible only when the gender dimensions of natural resources are mainstreamed in national policies. To protect natural resources, rural women and men must be empowered to participate in decisions that affect their needs and vulnerabilities. Addressing the gender gaps in natural resource management will help policy makers in formulating more effective interventions for conservation and sustainable use of the same.

Based on the study findings and conclusions it is hereby recommended that for sustainable use of natural resources in the Ihemi SAGCOT cluster there is a need for gender mainstreaming in the planning and execution of the different programs and projects implemented in the area. It is also recommended that training on the importance of CCRO should be offered to communities in the Ihemi cluster so that households in the area can apply these documents. With CCROs, farmers can use their land as collateral to access credit from formal financial institutions to transform their agriculture. Lastly, it is seen that there is a need to enhance women's knowledge, agency and collective action, as this will improve resource productivity; ecosystem conservation and sustainable use of natural resources.

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