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## **Indigenous Knowledge and Prospects for Income and Employment Generation: The Case of Handicraft Production among Rural Women in Tanzania**

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This paper examines the extent to which handicraft activities can generate viable income and employment for rural women in Tanzania. Based on survey data collected from three regions of Tanzania (Iringa, Dodoma, and Mbeya), the study finds that women engaged in handicrafts earn lower mean incomes than those in farming and livestock keeping. Handicraft activities are not done throughout the entire year, and selling activities have peak periods. The key challenges women face are: marketing, inadequate capital, difficulties in acquiring raw materials, and low prices. Some policy implications include: linking handicrafts to tourism activities so the activity can be promoted as a viable employment option for rural women; providing women with access to affordable loans and inputs; providing marketing channels for selling handicraft products; providing support in marketing products internationally; and providing training on improving the quality of products so that the women can compete in both local and international markets.

**Keywords:** *Indigenous Knowledge, Women, Handicrafts, Tanzania*

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### **1.0 Introduction**

The Tanzanian economy is predominantly agricultural. It is the main source of livelihood for more than 70 percent of people who participate in various activities in rural areas; its value added as a percentage of GDP averaged 31 percent in the past decade. In addition, agricultural export earnings contributed an average of 19 percent to total exports between 2000 and 2015 (World Bank

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2016; Bank of Tanzania 2005, 2010, and 2017). Of the total labor force engaged in agriculture, women comprise the majority, and they contribute more to agricultural activities than men. Thus, it is not an overstatement to say women are a key resource not only in the domestic sphere, but also in the labor and work sphere.

Since poverty is higher and there are more women in the rural areas of Tanzania, these women bear a disproportionate share of poverty. According to the 2012 Population Census, 70.4 percent of Tanzania's population were located in rural areas, and of these, more than half were female (National Bureau of Statistics 2013b). The pattern of poverty by location in Table 1 shows the head count ratio in rural areas is much higher than in urban areas, as well as in Dar es Salaam. Although the head count ratio in rural areas decreased from 39.4 in 2007 to 33.3 in 2011/2012, it still remains high. Thus, the assertion that poverty in Tanzania is a rural phenomenon is unquestionable (Economic and Social Research Foundation, United Nations Development Programme, and Government of the United Republic of Tanzania 2014).

Area	Head count (2007)	Head count (2011/12)
Rural	39.4	33.3
Other Urban Areas	22.7	21.7
Dar es Salaam	14.1	4.1

*Source:* National Bureau of Statistics (2013), 2011/2012 Household Budget Survey

*Table 1: Head Count Ratio by Area*

The disproportionate level of poverty that women endure is largely due to the skewed power asymmetry across gender that is even more pronounced in rural areas than in urban areas. Firstly, women in rural areas have to live with income shortfalls, which impel them to do without some basic necessities. This is due to the seasonal nature of agricultural activities. Secondly, the deprivation of basic amenities and social services in rural areas, for example a lack of running water, means that women walk several kilometers to fetch water. Thirdly, women endure the drudgery of physical labor in agricultural and household activities since they provide a significant share of labor in both areas. These factors, which are compounded by the oppressive power relations, work to the disadvantage of girls and women at the family level. This context and the responsibilities that women bear make it imperative for them to engage in various income-generating activities to supplement the income from agricultural activities so that they do not have to endure as much physical labor. As such, it is important to encourage and support women's efforts in non-agricultural income generating activities, specifically handicrafts.

Various studies have recognized the importance of handicraft production by rural women as a key source of employment and income generation in developing countries (Towseef et al. 2014; Richard 2007; Ngo

2005). For example, research in Sierra Leone found that 80 percent of women produce tie dye (or popularly known as *batik*), and in some areas, handicrafts provide a key source of foreign earnings. This potential for employment and income generation in handicrafts is appealing because women already possess the necessary skills since they have acquired them through indigenous knowledge (Rogerson 2000). In Tanzania, handicraft production has been analyzed, and a study by Ipsos Synovate in Kenya (2012, 9) concluded, "...the handicraft industry in Tanzania is rich and diverse in terms of product portfolio, volume, quality and variety..."

Besides this, a United Nations Educational, Scientific and Cultural Organization (UNESCO) study shows that the crafts sector contribution to developing countries' economy and exports is growing as youth and women increasingly engage in these activities as a solution for rural and urban unemployment (Richard 2007). Further, women's groups specializing in handicrafts have engaged in lucrative deals with foreign organizations to arrange markets for their products abroad. Such marketing deals have boosted the earnings of women (Instituto Oikos 2015; Selasini 2008). There are encouraging media reports on opportunities for selling these products in other African countries. For example, there is a strong market in South Africa for Tanzanian handicrafts, owing to their exceptional and attractive quality (Pesa Times 2014).

This research explored the viability of handicraft making among rural women as an income and employment generating activity using primary data collected from rural Tanzania. The study also uses secondary sources and existing literature on indigenous knowledge and income generating activities of rural women in general. Given the potential that already exists in making handicrafts and how they can enhance the incomes of women and create employment opportunities, the study investigated the *actual* income and employment opportunities that exist among women in rural Tanzania. Further, given the importance of ensuring that income and employment generation among rural women is enhanced and included in the policy agenda, this research draws some policy implications.

The research sought to answer the following questions:

- i. Why do rural women engage in handicraft production, and how do they acquire their skills?
- ii. How important is handicraft making as an income and employment-generating activity?
- iii. What determines the income of women in rural Tanzania?
- iv. What challenges do women face in handicraft production?

The paper is structured as follows: section one introduces the paper, followed by section two, which generally discusses the concept of indigenous knowledge in relation to handicrafts and gives the context in which women operate. Section two also builds a case for prioritizing income and employment generation for women in rural Tanzania. Section three discusses the findings from the survey data, while section four discusses estimation results from a simple model on determinants of earnings of rural women. Section five discusses the challenges with scaling up handicraft production for income generation, while section six concludes the paper and draws some policy implications.

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## 2.0 Indigenous Knowledge, Rural Women, and Income Generating Opportunities

The theoretical discussion in this section centers on the following: Firstly, it defines indigenous knowledge. Secondly, it provides the context of the study by examining the situation of women in rural Tanzania, regarding the challenges they face in providing for their families. Thirdly, it supports income and employment-generating opportunities using indigenous knowledge in handicrafts for rural women.

### 2.1 What is Indigenous Knowledge?

There is no single definition for indigenous knowledge in literature. The following definitions capture its overall essence: it is knowledge that is unique to societies, which is used for making decisions in various aspects of local peoples' livelihoods, such as agriculture, healthcare, food preparation, education, and natural resource management. Indigenous knowledge encompasses the wisdom, knowledge, customs, taboos, beliefs, teachings and practices of local villagers (East African Centre of Excellence 2009). Indigenous people learn the total sum of the knowledge and skills which people in a particular geographical area possess, and which enables them to get the most out of their natural environment. Such knowledge and skills are passed down from previous generations (Maferethlhane 2012). Knowledge and skills are adapted and developed by the new generation to adjust to changing circumstances and environmental conditions. Indigenous knowledge is:

The accumulated set of common sense knowledge and ideas of the local people about their everyday realities of living. It is the local knowledge that is unique to the given community and forms the basis for their local level decision- making in agriculture and connects people directly with their environment (Warren and Rajasekaran 1993).

These efforts, through generations, enable them to devise survival strategies, while appreciating the various definitions of indigenous knowledge. It's important to decipher what the various definitions capture. The following are the key elements and commonalities derived from the previous definitions: it is locally based and developed within the communities; it is used to solve problems within society; and it is dynamic.

Besides the existence of several definitions in the literature, there are also various terms that are used to describe this knowledge: "local knowledge," "traditional knowledge," "indigenous traditional knowledge," "indigenous technical knowledge," "traditional environmental knowledge," "rural knowledge," "traditional ecological knowledge," "folk knowledge," and "traditional wisdom" (Ryser 2012; Chisenga 2002). Essentially, these terms capture the idea that the knowledge is locally derived and developed within societies where people live. Using the division suggested by Preston-Whyte (1983), indigenous knowledge in handicraft activities covered in this study of African indigenous products documents the production of traditional baskets, clay pots, sleeping mats, and beadwork. The products can also include some made with a mixture of foreign and indigenous technologies such as carpets, woollen tapestries, pottery items, paintings, wood and stone carvings, and more modern jewellery. The

key handicrafts produced in the area where this study took place are baskets, clay pots, clay stoves, and mats. The knowledge used in making these products is acquired through families, friends, and the community, although nowadays, some institutions, such as churches, schools, and some non-governmental organizations (NGOs), organize training on handicraft making, and some even link groups of women to exports markets (Maasai Women Development Organization or MWEDO<sup>1</sup> in Arusha). By and large, knowledge is passed on through generations.

## **2.2 Women's Socioeconomic Conditions in Rural Tanzania**

Income generating activities for rural women in Tanzania must assume great significance owing to the socioeconomic context. Besides the many responsibilities that women have at the household level, such as providing labor in farming activities and the domestic sphere, the reality of living costs impel women to engage in additional income-generating activities to supplement their agricultural income. This section briefly discusses the socioeconomic context of rural areas, women's economic difficulties, and the desire to find ways to generate extra income to meet the household needs.

### ***2.2.1 Poverty and Fertility***

According to the 2011/2012 Tanzania Household Budget Survey, the average household size in rural areas is 5.3, compared to 4 in Dar es Salaam Metropolitan and 4.7 in other urban areas in the country. Not surprising, this pattern in which rural areas have a higher household size has persisted across all Household Budget Surveys, and it does not appear to be declining. As a result, the mean proportion of dependents in rural areas is higher than in urban areas: at 0.51 compared to 0.34 in Dar es Salaam and 0.42 in other urban areas. The Household Budget Survey further finds that poverty increases with household size: the Basic Needs Poverty for a household with one person is estimated to be 2.1, and this increases with the household size such that when the household size is beyond 10 people, the poverty headcount ratio reaches 41.9.

These statistics tell a story that is consistent with the general thinking: that poverty is more widespread in rural areas than in urban areas, and high fertility is associated with higher poverty. However, it is important not to impute a wrong lesson from this association: that because high fertility is associated with high poverty, then, in order to reduce poverty, one must reduce fertility. The fallacy in this line of thinking must be clear. The solution at the family level of a poor household faced with extreme poverty and high child mortality, deprivation of basic amenities such as household energy and water, and lack of employment for the mother, and no pension, is not to have more children. Thus, unless these associated deprivations are addressed, families will not freely choose to lower fertility. Reducing fertility requires addressing these associated afflictions that poor families suffer.

### ***2.2.2 Education Level***

World Bank data shows that the literacy level of Tanzanian women is lower than that of men: the 2012 data shows that the adult literacy rate for men was 10 percent higher than that of women (World Bank

2016). The difference in the literacy rate between men and women was much higher in previous years where data is available: for 2002 and 2010, the difference was 15 percent. Though the figures for 2012 show improvement, the 10 percent difference is still high.

The difference in the education level of women and men is more revealing if examined by location. The 2014 Integrated Labour Force Survey (NBS 2015) data shows that in rural Tanzania, the number of females who have never attended school is higher than that of males. Of the 3.5 million rural people of working age, 2.4 million were uneducated women. Compared to other urban areas and Dar es Salaam, the number of women without education is not very high: only 104,000 and 410,000, respectively, compared to just 34,000 and 129,000 men, respectively. Of course, in terms of percentage, it is higher for rural women than for urban women (see Appendix A Table 1). The high number of women who have never attended school in rural areas can be explained by cultural norms such as early marriage and the preference to educate boys over girls because girls are expected to provide domestic labor.

### ***2.2.3 Health Facilities***

Good health is an important aspect of human development. Among women, good health is particularly important since they carry the burden of pregnancy, which requires a good state of health to bear healthy children. Women in good health generally find it easier to overcome challenges associated with poverty. For example, a healthy woman will engage in gainful employment and other ways of generating income for her family. Thus, good health is important for poverty reduction, especially when complemented with other aspects of human capital such as education.

In general, rural women in Tanzania face more challenging health issues than their counterparts in urban areas: health facilities are scarce, and, when available, they are not well supplied with medicines and medical equipment. Cases are often documented of women delivering in the open, without a health care assistant, as well as women traveling long distances to access health facilities. In their study of Kilombero, Nyamtema et al. (2012) find sub-standard prenatal care in rural Tanzania causes morbidity among women, noting that the top reasons for poor quality services were a shortage of qualified staff and irregular supply of prenatal equipment and drugs. The 2015-2016 Demographic Health Survey also indicates lower percentages for rural women in the following maternal indicators: percentage delivered by a skilled provider, percentage delivered in a facility, and percentage of women who had a postnatal check-up in the first two days after birth (Ministry of Health, Community Development, Gender, Elderly and Children et al. 2016).

### ***2.2.4 Sanitation and Water Facilities***

Tanzania struggles to offer sanitation and water facilities to its people. According to the World Bank (2015a), water coverage in rural areas and urban areas in 2011 was 45 percent and 80 percent, respectively. Clearly, rural women are at a disadvantage in terms of meeting their requirements for water, as they spend more hours fetching it. Appendix A Table 2 shows about 30 percent of rural households

have to travel over a kilometer or more to get their drinking water, whereas a significant percentage (over 70) of urban households fetch their drinking water in under half a kilometer.

The long distance that women in rural areas travel to fetch water means that they lose time for completing other household activities. The concept of time poverty<sup>2</sup> clearly points to such use of time by rural women. Besides being time poor, having inadequate access to water and sanitation facilities leads to health problems (such as diarrhea, dysentery, and typhoid), especially among children (World Bank 2015b), which places the lives of women and children more at risk for death from such diseases (Thomas et al. 2013).

### 2.3 Rural Women and the Imperative for Creating Employment Opportunities

Detailed data that can provide an illuminating picture of the connection between employment and poverty, particularly by gender, in the rural areas, is not available. However, Table 2 shows the association of poverty and economic activity of the household head. Table 2 shows that being a housewife as an economic activity is associated with one of the highest poverty rates. Further, employed household heads enjoy one of the lowest poverty rates at 10 percent, while self-employed household heads suffer from poverty at a rate of 31 percent. In addition, household heads working as unpaid family helpers in businesses suffer from poverty at a rate of 41.8 percent. It is important to note that in most cases, even if they are not household heads, women are the ones who mostly work as unpaid family helpers.

Activity Status of Head	Food Poverty	Basic Needs Poverty
Employee	1.4	10.0
Self-employed With/Without Employees	11.2	31.0
Unpaid Family Helper in Business	0.0	41.8
Housewife	10.8	27.8
Student	9.4	25.1
Long Term Unemployed	7.2	23.6
Retired	0.5	4.7
Too Old/Disabled	11.6	43.0
Other	10.1	27.0
<b>Tanzania Mainland</b>	<b>9.7</b>	<b>28.2</b>

*Source: National Bureau of Statistics (2014), Tanzania Household Budget Survey Report*

*Table 2: Distribution of Poverty (in percentages) by Activity Status of the Household Head in the 12 months before the Survey, Tanzania Mainland, 2011/12*

Further insight on the connection between employment status and poverty by gender is given in Table 3, where employment is broken down into more commonly used categories of paid employment. It shows that men are two times more likely to have paid employment than women, while approximately 72 percent of females are engaged in self-employment in agriculture; the figure for males is 62 percent. Combining the information contained in Table 2 and Table 3, the following interesting insights are revealed: i) employees suffer less poverty than those in other forms of economic engagement; ii) more males are paid employees in comparison to females; iii) those who are self-employed (Table 2) suffer one of the highest poverty rates; iv) more females are self-employed or working on their own farms (71.7 percent) as opposed to males (62.4 percent).

<b>Employment Status</b>	<b>Male (%)</b>	<b>Female (%)</b>	<b>Total (%)</b>
Paid Employee	15.3	6.1	10.5
Self-employed (Non-agricultural) With Employees	2.6	1.0	1.8
Self-employed (Non-agricultural) Without Employees	10.0	8.2	9.1
Unpaid Family Helpers (Non-agricultural)	1.5	5.3	3.5
Unpaid Family Helpers (Agricultural)	8.1	7.7	7.9
Work on Own Farm	62.4	71.7	67.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

*Source:* Ministry of Finance (2010), Tanzania Gender Indicators

*Table 3: Employment Status by Gender 2006*

From Table 1, poverty rates are higher in rural areas than in urban areas, which suggests that being self-employed and working on farms leads to high poverty rates. Since more women are self-employed in rural areas, they suffer from poverty more than men. Another key observation is that women in rural areas predominantly engage in agricultural activities to provide the required income for their households. However, agricultural activities are precarious and are subject to the vagaries of the weather. Most agricultural activities in Tanzania are rain fed, and as such, shortages of food and income affect households that rely on agriculture for their livelihood, which makes it particularly difficult during droughts. Thus, there are risks in engaging in agricultural activities for rural households. This makes it imperative to have alternative income-generating activities that will offer households and women (as managers and caretakers) a steady income to supplement the income generated from agricultural activities.

Based on this overview, there are three significant rationales for rural women to engage in additional income-generating activities: i) they can reduce poverty through earning an income to afford basic amenities, and reduce the demand for more children; ii) they can increase the opportunity cost for their



time, which will contribute to a low fertility rate. The reduction in fertility will, in the long run, contribute to poverty reduction; and iii) they will help to supplement income from agricultural activities, which is important in droughts and when agricultural prices are low.

Richard (2007) presents essential characteristics of handicraft production that create potential employment for rural women. First, job creation is low cost because handicrafts are a home-based industry that does not require many expenses to set up. Second, women use indigenous knowledge that is locally acquired along with the raw materials that are locally available. Third, agricultural and pastoral communities exemplify craft making, using traditional knowledge for generating additional income when crops fail or when natural disasters affect their crops.

### **3.0 Handicraft Production in Rural Tanzania: Evidence from Survey Data**

#### **3.1 Data and Research Methodology**

The research methodology used for this study can be characterized as descriptive with a survey design. The study collected primary data in June 2016, from 3 rural areas of Tanzania: Iringa, Mbeya, and Dodoma. The target population was rural women who produce handicrafts in those regions. Since data on the population of women who make handicrafts is not found in official statistics, it was necessary to seek out the women from the villages. The areas were purposely identified from literature as areas that are known for handicraft production. The sample for each region was determined proportionate to the total population in that region, which was applied to the 200 questionnaires that we envisaged to administer. After data cleaning, the observations were reduced to 195 individuals, and 4 women groups.

Both closed and open-ended questions were used in the questionnaires to collect data. The questions were formulated to gather information from women about their daily activities, the challenges they face, and suggestions to deal with these challenges. This study is one of a kind as it assesses the current status of handicraft making among rural women. Questionnaires were administered to women that produce various handicrafts—baskets, mats (sleeping and floor), clay pots, clay stoves, caps, beads, batik, *vitambaa* (various fabrics), soap, cakes, clay pitcher, sweaters, and brooms—and engage in farming and livestock keeping. Table 4 gives the respondents by region (by gender of household head).

Region	N	Gender of Household Head		Occupation/Activity	
		Female	Male	Handicrafts	Farming/livestock
Dodoma	69	69	0	29	40
Iringa	46	14	32	21	25
Mbeya	80	28	52	37	43
Total	195	111	84	87	108

*Source: Survey data*

*Table 4: Respondents by Gender of Household Head and Occupation*

While all women in the sample in Dodoma are heads of their household, in Iringa and Mbeya, a significant number of them come from male-headed households. Overall, 57 percent of the sampled women are from female-headed households. Appendix A Table 3 shows that 69 percent of respondents whose main occupation is handicrafts are married. With regards to number of children, 46 percent of the respondents have between 4 and 6 children.

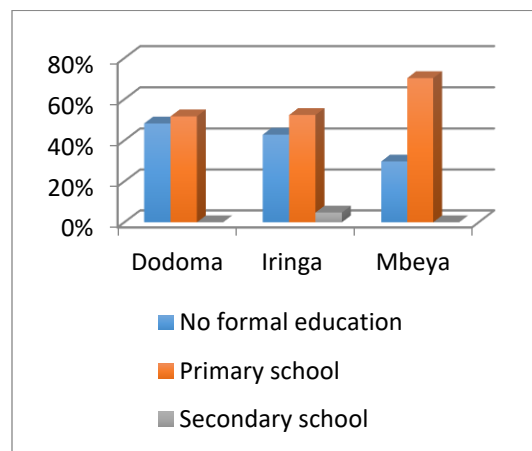
### 3.2 Profile of Respondents

#### 3.2.1 Education Level and Access to Health Facilities

Most of the respondents have primary school education as their highest level of education attained; with Iringa having the highest percentage (Appendix A Figure 1). Handicraft producers also received little to no formal education with ranging percentages depicted in Figure 1 and Figure 2. In general, Dodoma has the highest percentage of women with no formal education, followed by Mbeya. When the data is disaggregated according to activity or occupation, the overall picture is the same: Dodoma leads in terms of having the highest percentage of women with no formal education in handicrafts production, followed by Iringa. For women in farming and livestock keeping, Iringa has the highest percentage of women with primary level education.

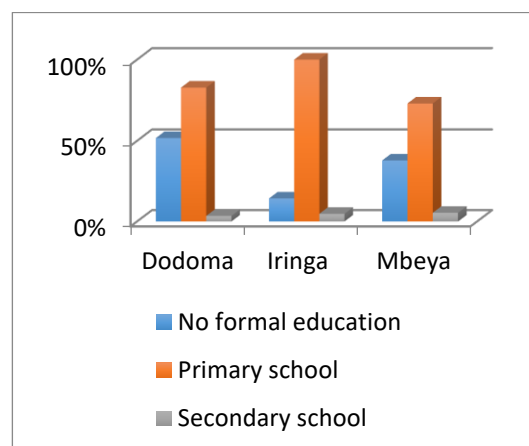
The low level of education exhibited by the respondents can partly be explained by the difficulty in accessing education and other social services by women. For example, Dodoma women suffer the highest percentage of difficulty accessing health services, education, and training services. Women in Dodoma from the sample group have the lowest level of education. In Iringa and Mbeya, more than 50 percent of women find it difficult to access education services. The findings from the study and literature confirm the fact that rural women face difficulties in accessing health services. We found that in Dodoma and Mbeya, a significant percentage of women find it fairly difficult to access health services. On the other hand, in Iringa, about one-third of the respondents find it easy to access health services (Figure 3 and Figure 4).

The reason why women find it difficult to access education and health facilities can be attributed to their rural geographical location as facilities are not widely available in comparison to those in urban areas. Thus, rural women face more health challenges than their counterparts in urban areas due to fewer basic health facilities. When facilities are available, they are not well equipped with medicines, medical personnel, and necessary infrastructure (ESRF et al. 2014). Often, rural women report walking long distances to access health facilities. The issue of transportation is also present in the education sphere. Schools are located far from communities where women live, forcing students to travel long distances to reach them (Human Rights Watch 2018). According to the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC 2019), there are on average two Folk Development Centres (FCDs) in each region in Tanzania, a number which does not meet the needs of rural women who are often dispersed in remote rural areas.



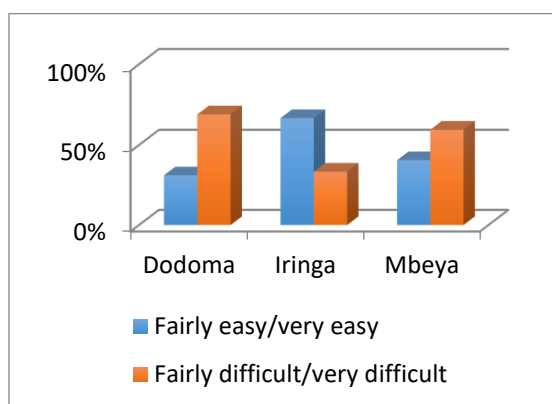
*Source: Survey data*

*Figure 1: Highest Level of Education Attained: Handicraft Producers*



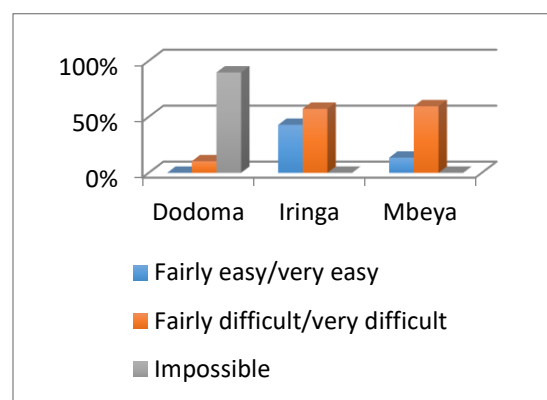
*Source: Survey data*

*Figure 2: Highest Level of Education Attained: Farmers/Livestock Keepers*



*Source: Survey data*

*Figure 3: Ease of Accessing Health Services by Region*

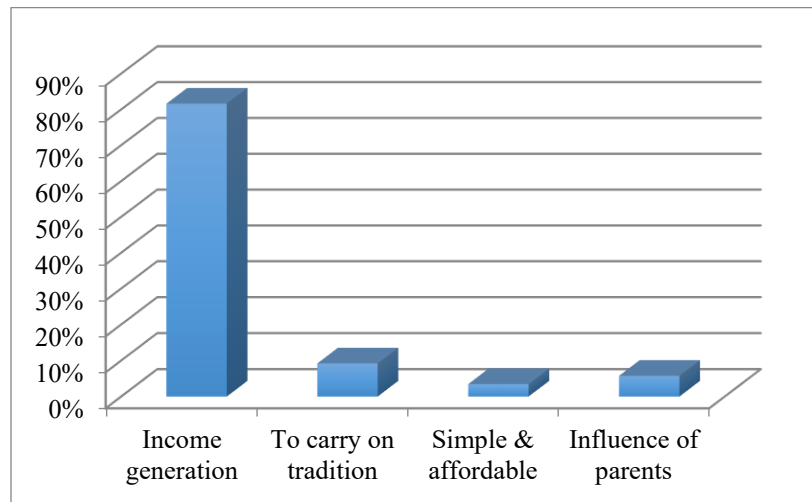


*Source: Survey data*

*Figure 4: Ease of Accessing Education and Training Services by Region*

### **3.3.2 Reason for Engaging in Handicraft Production and Acquisition of Skills**

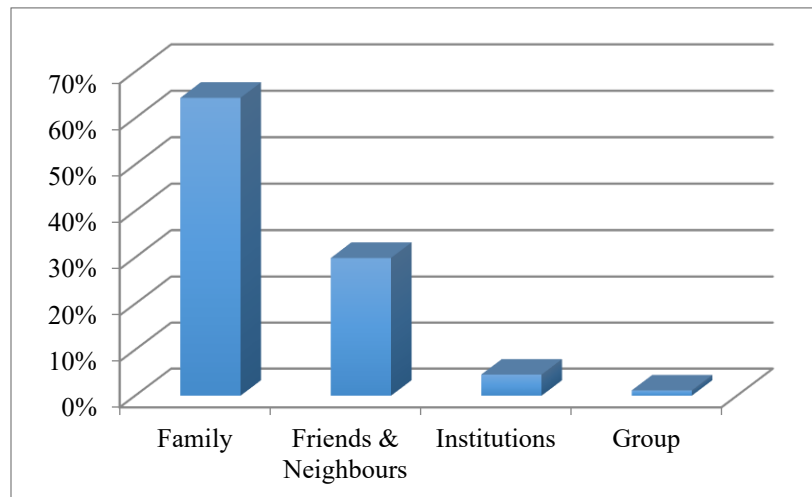
The study enquired about the reasons women chose to engage in handicraft making. Figure 5 supports the concept of additional income for families (82 percent). Since knowledge of handicraft production is passed on from generation to generation, 15 percent of women indicated that they chose to engage in making handicrafts to continue the tradition. A small percentage (3 percent) indicated they found it simple and affordable to start.



*Source: Survey data*

*Figure 5: Reasons for Engaging in Handicrafts*

The survey also confirms the generational findings from literature as rural women learn their skills from family members. In Figure 6, 64 percent of the women received their skills from family members while 30 percent from friends and neighbors. Only 5 percent of women learned their skills from institutions or groups. This confirms the assertion that indigenous knowledge is often passed on through families within a given location. This concept can be attributed to their parents' occupations in farming (46 percent), along with a significant percentage of mothers (36 percent) and fathers (5 percent) involved in handicraft making. The small influence of institutions or groups proves there is a training gap for women in handicraft activities.



*Source: Survey data*

*Figure 6: How Handicraft Skills are Acquired*

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### ***3.2.3 Saving and Group Memberships***

Over 70 percent of women in handicrafts indicated they had savings. Of these women, 61 percent of them decided when and how to use the savings, while 33 percent of them jointly made these decisions with their husbands. In terms of regional variation, more women in Iringa and Mbeya made decisions without their husbands.

In contrast, in groups, saving decisions are made by all members of the group. Among all women who made handicrafts, only 12 were members of groups (savings or handicraft groups). When asked to discuss the benefits from belonging to groups, more than half indicated that groups enable them to save and borrow money. Some of the other benefits are: entrepreneurship training, assistance with problems, accessing markets, and product pricing.

Another aspect to consider is where women save their money. While the survey did not collect data on where the rural women save their money, women who belong to groups like SACCOS (Savings and Credit Cooperative Societies), Neema Group, Silk Group, Vikapu Bomba, Tumaini Ndiwili, and Ususi na Ufinyanzi Lulanzi are most likely to save within these groups. Among the benefits of belonging to a group is the ability to save and borrow money. Women who do not belong to groups either save their money at home in a safe place or through mobile money. This conjecture is derived from a Finscope study that revealed between 2013 and 2017, there was a 14 percent increase in people saving money on mobile wallets. This was the most common way of saving money. The second method, saving and keeping money at home, has declined. The Finscope study revealed that adults from poor households, people living in rural areas, young people, farmers, and women were among groups that were less likely to own a SIM card or a phone (Finscope Tanzania 2017). Through this information, one can conclude that most rural women save their money in a safe place at home.

### ***3.2.4 Location of Activity, Source of Start-up Capital, Costs, and Earnings***

The survey confirms that handicraft making is a home-based activity with all women in handicraft production working from their home, except one woman who conducted her activities both at home and at her shop. The home-based nature of these activities allows women to generate income while attending chores. For women who belong to groups, three quarters of them (that is three groups) perform their activities at home while only one group had a field office. Thus, there is little variation in the locations where handicraft production takes place.

The study found that not all women in handicrafts needed start-up capital: approximately half of the women needed start-up capital, and of these women, 89 percent of them used their own savings as start-up capital. Other sources for start-up capital include borrowing from friends and family (9 percent) and getting a loan; however, only one respondent got a loan.

The costs and income of women's activities is given in Table 5. Information from women belonging to groups is also included for comparison. It shows that women in handicraft production have the lowest mean input costs, operating expenses, income, and household expenditures.

	Obs.	Mean	Std. Dev.	Min	Max
<b>Handicrafts</b>					
Cost of Inputs	65	24675.8	80346.04	1000	650000
Operating Expenses	16	23700	26415.2	1200	77000
Average Income Per Month	75	59986.7	80559.3	5000	600000
Belong to a Group	12	132833.3	164521.8	30000	600000
Did Not Belong to a Group	62	46653.2	41596.6	5000	200000
HH Expenditure Per Month	72	61569.4	57480.2	10000	300000
<b>Farmers/Livestock Keepers</b>					
Cost of Inputs	76	69177.6	93161.8	1000	500000
Operating Expenses	25	220166.6	295451.9	6000	1100000
Average Income Per Month	84	195109	335876.2	5833	2500000
HH Expenditure Per Month	81	112820.6	82753.03	10000	380000
<b>Groups</b>					
Cost of Inputs	4	565000	491629.9	90000	1170000
Operating Expenses	4	211250	309848.8	30000	675000
Average Income Per Month	4	960000	1403519.0	180000	3060000

*Source: Survey data*

*Table 5: Costs and Earnings by Activity*

When comparing the mean incomes of women who belong to groups to those who do not, Table 5 shows that the mean income of women who belong to groups is much higher than that of women who do not belong to groups, with their mean income being doubled. The mean income of the groups based in Iringa is 16 times higher than that of individual handicraft producers and 5 times than farmers/livestock keepers. This comparison requires a rigorous analysis of what determines the average income of rural women while also bearing in mind that earnings differ according to occupation.

When comparing the average income of a woman in handicraft production to the minimum wage of the agriculture sector, the average income for women in handicrafts is lower than the minimum wage in agriculture for the private sector at 100,000 Tsh per month (URT 2013). For groups, the average monthly income is higher by approximately 32 percent. This is a clear indication of the low average incomes that

women in handicrafts receive. These statistics also serve to motivate independent producers to join groups to increase their incomes.

When considering handicraft production as a viable employment option, one must consider the following: the average time women spend working on their products and the time they are fully employed throughout the year. Findings from the survey show that on average, women spend six months working on their products. Throughout this time, there are “peak months” in which handicraft sales are the highest. Typically, peak months are between June and October. Peak months also coincide with the best times for viewing wildlife in the Tanzanian parks (Tanzania Tourist Board 2019). This connection shows the link between handicraft sales and tourism, as sales are high during the best months for viewing wildlife in Tanzania’s national parks and are lower in the off season.

This timeline implies that women in handicrafts do not collect income for approximately half a year. The time they spend in production impacts their earnings. In order to supplement their seasonal income, they are forced to do other activities when they are not working on their products. The data shows that for women whose main occupation is handicraft making, about 84 percent had secondary occupations, mainly farming/livestock keeping and trading<sup>3</sup>. Since the women are not fully employed for six months, they engage in other income generating activities to supplement family income. The diversification of activities ensures that the household maintains a certain level of income to accommodate their family’s needs. Supplementing income is a survival strategy for women, given the seasonal nature of handicraft making activities.

A challenge in devising policies to improve income levels for women who sell handicrafts is addressing the seasonality of their occupation. The survey enquired whether the women worked on their products in every month of the year. Of the women whose main occupation was handicraft making, 63 percent indicated that they did not work on the products in every month of the year. On average, the women worked on their products for six months hence they are not fully employed in handicraft making. During the off time, they perform secondary activities to supplement their income. A policy change that can address seasonality would ensure that the women work on their handicrafts throughout the year to help their earnings from handicraft sales. Specifically, a policy that would ensure steady income could include producers supplying products to cultural centers within the country and export markets. As a result, they would work on their products throughout the year to keep up with demand. This would also increase their marketing and expand their outreach.

#### **4.0 What Determines the Average Income of Rural Women?**

Understanding the determinants of the women’s income helps in policy creation. The human capital theory has guided empirical analysis about the determinants of earnings in literature (Willis 1986; Kerr and Teal 2012). According to the theory, education that provides skills to individuals is an investment that gives social and private benefits, namely, higher lifetime earnings of individuals, higher tax collections, more awareness of educated individuals’ issues in relation to health, and increased trust in communities.



In the work place, higher skills are translated into higher productivity and people who are educated are also easier to train on the job.

Studies on the effect of education on earnings, pioneered by Willis (1986) and Becker (1964), focus on estimating an earnings function given in Equation 1:

$$(1) y_i = f(s_i, A_i, z_i) + u_i$$

Where  $y$  denotes earnings;  $s$  as the number of schooling years;  $z$  are variables that affect earnings such as years of experience and family characteristics, which differ across individuals;  $A$  is an unobservable variable that denotes an individual's ability; and  $u$  is a disturbance term.

Estimation of Equation 1 involves assuming a hypothetical economy where workers differ by the number of schooling years ( $s$ ), age ( $t$ ), and experience in the labor market. A variable  $x$  is defined as:  $x = t - s - b$ , where  $b$  is the age at which an individual begins schooling. With this in consideration, Equation 1 (Mincer 1974) can be rewritten as:

$$(2) y = \varphi(s, x) + u$$

The model estimated, which is called the human capital earnings function (De Bartolo 1999) is then given as:

$$(3) \ln y = \beta_0 + \beta_1 x + \beta_0 x^2 + \beta_0 s + u$$

In equation 3, the logarithm of earnings ( $\ln y$ ) is modelled in accordance to individual characteristics as well as other factors that enhance earnings. While estimating the results of the empirical data, the variables used are given in Appendix A Table 4. The data used for estimation and its characteristics were investigated first. The income statistics are reported in Table 6, and Figure 7 (the histogram overlaid with a normal distribution) and Figure 8 (a kernel density estimate<sup>4</sup> overlaid with a normal distribution) give the distribution of the dependent variable, *lnavgincome*. Visually, the dependent variable is normally distributed, with a Kurtosis value<sup>5</sup> of approximately 3. The normality of earnings is confirmed by the Shapiro-Wilk W test, which shows that the hypothesis accepts *lnavgincome*.

Mean	Median	Skewness	Kurtosis	Variance	Standard Deviation
11.001	10.819	0.401	2.972	1.393	1.180
Shapiro-Wilk W Test for Normal Data					
Variable	Obs	W	V	Z	Prob>z
lnavgincome	159	0.984	2.006	1.583	0.057

Table 6: Income Statistics

It is important to clarify here that since women who are engaged in handicraft making supplement their income during the low season, we identified those women whose *main* occupation was handicraft making. Then we further asked them whether they engaged in any secondary occupation; of the 87 women whose main occupation was handicraft making, 73 also engaged in other activities. For statistical analysis, it was assumed that handicraft production generated a significant proportion of household income and that the monthly income given related to income generated from handicrafts to see its effects on earnings.

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
<i>age</i>	0.078**	0.031	2.51	0.013	0.016	0.139
<i>age2</i>	-0.001**	0.000	-2.32	0.022	-0.001	-0.000
<i>married</i>	0.402**	0.175	2.30	0.023	0.056	0.747
<i>noeduc</i>	-0.052	0.196	-0.27	0.790	-0.439	0.334
<i>hand</i>	-0.708***	0.168	-4.22	0.000	-1.039	-0.376
<i>saver</i>	0.590***	0.197	3.00	0.003	0.202	0.979
<i>inheritall</i>	0.665***	0.185	3.60	0.000	0.299	1.030
<i>sellerhus</i>	-0.947**	0.381	-2.49	0.014	-1.700	-0.194
<i>cons</i>	9.249	0.828	11.18	0.000	7.613	10.886
Statistics: Number of obs = 147; F (8, 138) = 9.40; Prob > F = 0.000; R-squared = 0.353;						
Adj R-squared = 0.315						

Note: Dependent variable is *lavgincome* (log of average monthly income); \*\*\*, \*\*, \* - significant at 1 percent, 5 percent, and 10 percent, respectively.

Table 7: Regression Results

#### 4.1 Estimation Results

The regression results in Table 7 show the signs on the coefficients are those hypothesized in literature, and all the coefficients are statistically significant, except for the coefficient on *noeduc*. Age is positively related to average earnings in that the older a woman is, the more likely her average earnings will be higher. The coefficient on age-squared is negative, and it is statistically significant at 5 percent: as women get older, average earnings fall after a certain threshold. The negative result on the *hand* variable indicates that women whose main occupation is in handicrafts earn lower average earnings than women in farming, and the coefficient is statistically significant at 1 percent. The variable *saver* is positively related to average earnings, and the coefficient is statistically significant at 1 percent, meaning that women who save are likely to have higher average earnings than those who do not.

With regards to inheritance, the results indicate that inheritance of key property by family members is positively related to average earnings, and the coefficient is statistically significant at 1 percent. This result is significant in looking at unfair cultural practices that only grant inheritance to males. The results show that when women recognize their right to inherit key property, their incentive to contribute to family income is heightened. Further, results show that there is a negative relationship between husbands as sellers of products and average earnings of women: the dominance of men has a negative effect on women's average income, and the coefficient is statistically significant at 1 percent. This supports the importance of empowering women for their own development. If men are allowed to sell their products, it negatively impacts their earnings. Studies have shown that in general, men are likely to spend household income on non-essentials (Waseem 2004).

These results can be insightful when creating policies that address the various constraints regarding women's earnings. Studies in other countries indicate that women involved in handicrafts tend to have higher incomes than those in farming activities or formal employment. For example, in Vietnam, the average income from handicrafts is higher than both the national average income and average rural income (Ngo 2005). In Nepal, exports of handicrafts significantly contribute to the export earnings of the country, and they constitute the largest export item (Government of Nepal, Ministry of Industry, Commerce and Supplies 2019). In Ethiopia, a technical report by the International Trade Centre (ITC 2010) indicates handicrafts are the most important source of income for the poor.

In drawing these comparisons, one can use them as an example for Tanzania. In Vietnam, there is historical governmental support through policies for the handicraft sector. The Vietnamese economy transitioned from a centrally-planned economy to being market-oriented in 1986 (a transformation period called *Dao Moi*). Now, Vietnam enjoys hundreds of years of making traditional crafts (Ngo 2005). While the government's role in starting craft villages was limited, it has over the years assumed a supportive role through policies that ensured that craft villages thrived and became more productive. The policies encourage the export of handicrafts by simplifying the process of obtaining permits to export along with tax incentives. Specifically, eliminating an export tax for handicrafts set at 0%; a refund of value-added tax, no tax payments for indigenous people for the first three years of starting a business, supporting entrepreneurs to participate in international fairs, obtaining land more easily than other businesses, and receiving funding for training craftspeople (Szydlowski 2008). These supportive policies have contributed to Vietnam's success in handicrafts exports. Other benefits include employing over a third of Vietnam's rural labor force to contribute to household income (Mahanty and Dang 2012).

In Nepal, handicraft exports contribute significantly to export earnings. Handicrafts are currently Nepal's largest export item (Government of Nepal et al. 2019). Nepal's success in the export of handicrafts is attributed to the following factors: improvements to the quality of products; new designs that are tailored to suit international tastes; and better marketing campaigns to target the specific markets. Over the years, more Nepalese traders participated in trade fairs both locally and internationally, which have enabled them to get more orders and to reach wider markets (Economist Intelligence Unit 2014).

While considering rural Tanzania, the success in Nepal indicates the need to address the constraints that women producing handicrafts face in order to improve their average incomes. The commonalities between Vietnam and Nepal are encouraging the development of indigenous knowledge in crafts and establishing supportive policies to help the crafts industry look beyond their national borders.

### **5.0 Scaling up Handicraft Production for Income Generation in Rural Tanzania: What Are the Challenges?**

Enhancing employment and income-generating activities for rural women requires identifying and addressing the challenges they face. The main challenges that the women in the study indicated were: marketing, inadequate capital, difficulties obtaining raw materials, and low prices. When the women were asked to indicate ways in which these challenges could be eliminated, they mentioned increasing assistance in accessing reliable markets, affordable loans, and land to grow their key product, *mululu*. *Mululu* is a type of grass that grows in swampy areas. However, the grass is depleting due to agricultural activities.

It is not surprising that these women face marketing problems. The survey results show the most common marketing strategy is word of mouth at 98 percent, while some sell their products at churches, auctions, and by peddling. About 83 percent of the women indicated they sell their products directly to consumers, while a few sell them to traders (16 percent) and middlemen (8 percent), and 12 percent sell to a combination of consumers and middlemen. These marketing channels reveal the extent to which these women understand their market and how competitive their products are, locally and internationally. By and large, their main customers are final consumers, and they market their products mostly by word of mouth. This indicates a limited understanding of their market and their competitiveness beyond their own local community. This is a hurdle against innovation and taking advantage of markets beyond local ones. As a consequence, their ability to earn more from their products is negatively affected.

The women who produce the products also sell them with some help from family members. Since handicraft production takes place within the home, children and husbands offer their help. Compared to women in farming/livestock, women in handicraft production, especially in Iringa, still significantly participate in selling their produce. The involvement of husbands becomes more visible in selling produce, followed by women selling jointly with their husbands. The involvement of children is minimal. One explanation could be that men often see handicrafts as a women's activity, and hence do not participate as much. This difference is depicted in Figure 2 and Figure 3 in Appendix A.

Inadequate capital is common not only in rural areas but also among urban informal sector entrepreneurs (Mkenda and Aikaeli 2014; Rogerson 2000). The finding corroborates results discussed earlier regarding start-up capital; 89 percent of women either use their own savings or borrow from friends/family to begin their businesses. Only one respondent received a loan. Financial constraints affect the diversification and expansion of their products.

The problem of inadequate capital is likely to be a symptom of other problems related to an under-developed rural financial market and lack of knowledge on government funding. With a developed rural financial market, women can utilize loans to finance their activities. Information on development funds for women must also be disseminated for other women. More importantly, availability of such funds must be given to women in villages so they can access funds as well. While the development of rural financial services is important, developing a market for handicrafts will boost the producer's confidence as sales rise.

Further, entrepreneurial groups will make women's development funds more effective. Belonging to a group can help women access finances more easily as well as training on marketing and entrepreneurship that NGOs offer to women. The study shows 86 percent of women handicraft producers did not belong to any group, which negatively affects their ability to access support services offered by groups. Those who belonged to groups indicated that group membership enabled them to enjoy benefits such as saving and borrowing, training on entrepreneurship, problem solving, accessing markets, and obtaining higher prices. Group membership also helps women find raw materials. A group with a known managerial set up can better secure land through the local government or through purchasing land, as opposed to independent women who might take years to save enough money.

Rural women indicated access to financial assistance as one of the major constraints they face. Financial difficulties limit the extent to which they can expand their activities. The problem with accessing microfinance institutions (MFIs) in rural areas is that women find them difficult to use because of their high interest rates, short repayment periods, and restricted lending groups. As for banks, women are required to have a license for their business and provide collateral. Since most women operate informally and are poor, they cannot provide licenses and collateral to secure loans.

It is also important to note that microfinance institutions (MFIs) often require women to belong to groups in order to access loans. Social collateral instead of physical collateral is seen as more convenient and affordable to poor entrepreneurs who generate income from informal activities. The idea is that as a group, the possibility of repaying the loan is higher because members, through social ties, are able to screen, monitor, and ensure that the loans are repaid (Postelnicu et al. 2013). Women who engage in similar activities should use each other for support for their businesses.

However, studies have found that sometimes groups do not last, and as a result, a few individuals who care more than the others end up with the burden of repaying the loans that were taken out by the group. Studies also found that members of the group sometimes run away with the money, leaving the few to repay the loan for them (Brown et al. 2015). Thus, it is important that when women form groups, they should be committed to achieving similar goals. Indeed, benefits such as training and access to markets are better secured when they are organized in groups.

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## 6.0 Conclusion and Policy Implications

This study examined whether indigenous knowledge in handicraft making among rural women in Tanzania can be a viable option for income and employment generation. It focused on primary data collected from three regions, namely Iringa, Mbeya, and Dodoma, using a structured questionnaire with a mixture of closed and open-ended questions. Key aspects of this study were observations of the women, their environment, the products and materials used, and pictures.

The conclusions of the study and policy implications are as follows: first, the mean income generated from handicraft activities is lower than that from livestock keeping or farming. This is not encouraging given the potential that exists for earning more from such activities. The lower mean incomes from such activities could increase if the women were alleviated from the constraints previously addressed so they can earn higher incomes from the production of handicrafts.

A way to improve incomes of women in handicrafts is by linking their handicraft activities to tourism activities. It is widely acknowledged that tourism and handicrafts are linked: the development of tourism bolsters handicrafts in terms of sales and innovation. This is because tourists often want to take a piece of the local cultures they visit as souvenirs. For countries where the tourism industry is booming, the handicrafts are often tailored to the tourists' preferences (see for example, Nepal; Government of Nepal et al. 2019). In turn, the women who produce the handicrafts benefit from sales. Handicraft making is a key way tourist markets include impoverished people and generate pro-poor income (International Trade Centre 2010).

Handicraft production and tourism both promote the cultural assets of their nations. Besides their unique wildlife and attractions (Tanzania is specifically popular for wildlife tourism), the purchase of high-quality handicrafts motivates tourists to spread the word or even return. Thus, handicrafts promote tourism and in return, tourism is important for growth of handicraft production and sales, as well as preservation of local culture (Yavari 2008; O'Connor 2008; and Yunis 2008).

Handicraft products should be made available to tourists in major circuits where they stay, as well as in non-traditional places like supermarkets where consumers go to purchase household goods like coffee. This is important for areas that are far from the traditional tourist points, such as Arusha and Kilimanjaro, where Maasai handicrafts are marketed fairly easily due to the existence of popular outlets for handicrafts made by Maasai women: the Maasai Market in Arusha and several curio shops in Moshi (the main town in Kilimanjaro Region). In addition, Moshi is the town tourists use to climb the Kilimanjaro Mountain, and Arusha is the gateway to popular tourist sites such as the Ngorongoro Crater and the Serengeti National Park, to name just a few. Further, the government's current drive to boost domestic tourism should involve aspects that emphasize unique handicrafts that Tanzanians can buy for their homes for both decorative purposes and other uses. For example, the use of baskets made by rural women can help cut down the use of plastic shopping bags. Further, education on interior design that incorporates traditional handicrafts should be encouraged and marketed so that Tanzanians can learn and appreciate such handicrafts.

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Marketing challenges can be attributed as one of the factors behind the low mean incomes of rural women because their main channel of marketing is by word of mouth. Oral marketing has limited outreach and leads to low advertisements and earnings. Thus, improving the marketing of crafts can help women earn higher incomes. A possible way to do this is to connect them with well-established marketing organizations. For example, the Maasai women in Arusha are connected with an NGO called MWEDO to market their products. Through such organized marketing, the women's products are priced better.

The crafts rural women make can also be sold for higher prices if the quality is improved. By and large, the quality of the crafts trails behind those of Arusha and other countries. Improving the quality of the products can help women compete in the local and global market for handicrafts. For example, the Maasai crafts made by women in Arusha are a higher quality because they are exported.

Policy makers should consider establishing cultural centers or villages where crafts, cultural artifacts, and unique traditions could be displayed and sold like those in Rwanda, Malaysia, Namibia, Uganda, and South Africa. These cultural centers can be in partnership with the government or the private sector as a way to provide outlets for women to sell their products. Such outlets can provide a steady market and fair price for the women's products, which in turn can help increase their creativity through getting feedback on their products from tourists and other buyers in terms of the products selling well or needing adjustments or improvements, or some requiring tailoring to the needs of buyers. Handicraft products, like other products, thrive based on improvements as required by the market. The centers can also ensure the products displayed and sold meet international quality standards. This will especially help the women who operate in regions that are far from key tourist destinations in Tanzania.

Secondly, the study finds that most women have little to no education, which can occasionally result in lower profits. In the model, high levels of education have positive effects on earnings, although the coefficient is insignificant.

A way to improve this situation is to offer them entrepreneurial skills, given that they already possess the traditionally-acquired skills of making handicrafts, which enable them to run their activities more efficiently and find ways to address the constraints they face. Other issues that should be addressed in training are the ability to identify markets, producing according to demand, and improving craft quality to be competitive in both local and export markets.

Thirdly, another challenge that women in handicraft production face is inadequate loans or capital. A possible way to address this constraint is to encourage rural women to form groups or cooperatives enabling them to access various funding services and training opportunities. This is because, more often than not, financing organizations and those that offer entrepreneurship training to women prefer providing such services to groups, as they are traceable and have permanent work places.

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**Appendix A**

Area	Level of Education	Male	Female	Total
Dar es Salaam	Never Attended	2.23%	0.01%	4.29%
	Pre-primary	0.04%	0.02%	0.03%
	Primary	52.13%	57.17%	54.74%
	Secondary	35.60%	30.15%	32.75%
	Tertiary	10.06%	6.48%	8.19%
Other Urban	Never Attended	4.10%	11.39%	7.99%
	Pre-primary	0.02%	0.01%	0.02%
	Primary	60.05%	60.87%	26.25%
	Secondary	28.95%	23.89%	26.25%
	Tertiary	6.87%	3.84%	5.25%
Rural	Never Attended	15.27%	29.96%	22.81%
	Pre-primary	0.13%	0.08%	0.11%
	Primary	70.56%	59.90%	65.09%
	Secondary	12.66%	9.19%	10.88%
	Tertiary	1.39%	0.87%	1.12%

*\*Note: Percentage of population for each area.*

*Source: NBS 2015*

*Appendix A Table 1: Percentage\* Distribution of Working Age Population (Ages 15 Years and Above) by Area, Level of Education and Sex, 2014*

Distance (Km)	Dar es Salaam	Other Urban	Rural	Total
0.0-0.4	90.5	72.1	46.2	54.6
0.5-0.9	8.7	16.1	25.0	22.0
1.0-1.9	0.7	5.9	14.9	12.1
2.0 or Above	0.1	5.9	13.8	11.2
Total	100.0	100.0	100.0	100.0

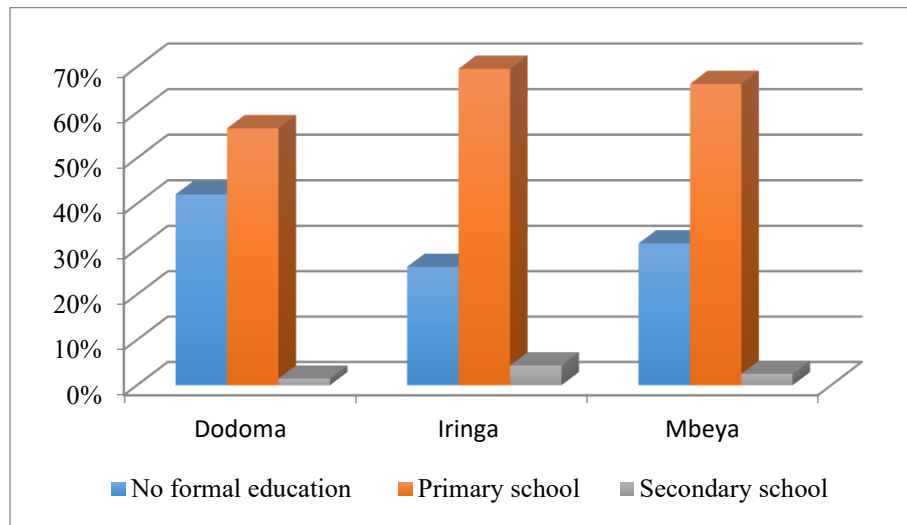
*Source: National Bureau of Statistics (2015), Integrated Labour Force Survey 2014: Analytical Report, Dar es Salaam.*

*Appendix A Table 2: Percentage Distribution of Households by Distance to Sources of Drinking Water and Area, Tanzania Mainland, 2014*

Number of Children	Marital status				
	Single	Married	Divorced	Widow	Total
None	1	0	0	1	2
1-3	3	22	2	6	33
4-6	0	31	4	5	40
More than 6	0	7	1	4	12
Total	4	60	7	16	87

*Source: Survey data*

*Appendix A Table 3: Marital Status and Family size*



*Source: Survey data*

*Appendix A Figure 1: Highest Level of Education by Region: Whole Sample*

Variables	Description
<i>lavgincome</i>	<p><i>Log of average monthly income of all women: To get the average income that women make in their handicraft activities, we collected data on the cost of inputs and the sales revenue they got from selling the products. Then income was revenue less costs of inputs and other expenses.</i></p> <p><i>However, the data was unreliable as a significant number of women inflated their costs, leading to a negative profit (income), and there were a lot of missing observations<sup>6</sup>. We then decided to use the income data that we asked the women to provide, without taking out the costs. This is the income data that we used in the estimation.</i></p>
Age	<p><i>Age of respondents in number of years: Typically, age is important as a determinant of earnings over individuals' lifetime. Age is expected to have a positive effect on earnings.</i></p> <p><i>In literature, age is taken as a proxy for experience (Heckman et al. 2008; Foxton and Massey 2015).</i></p>

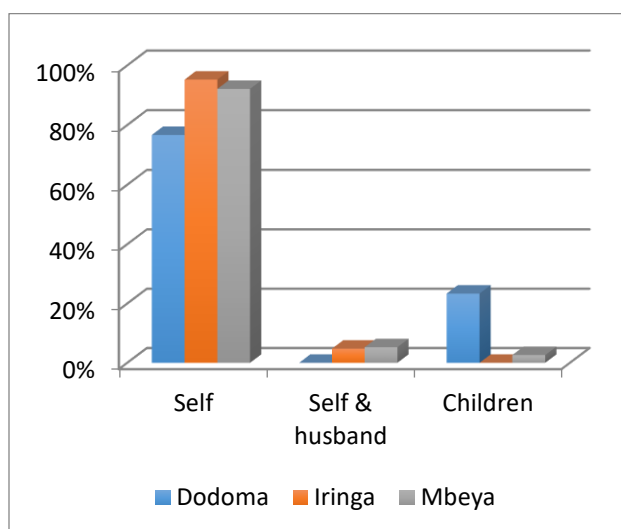
Age 2	<i>Age of respondents in number of years squared*: Adding age-squared as a covariate allows us not to take for granted that the effect of age on earnings is linear. Due to the Taylor series approximations that tell us that for many smooth functions, they can be approximated by a polynomial, and thus age-squared allows us to estimate the coefficients for the approximation for a known or unknown non-linear function of age (Foxton and Massey 2015).</i>
Married	<i>A dummy variable = 1 if married; 0 otherwise: A dummy that takes the value of 1 if married, and 0 otherwise; the effect of marriage on earnings from various studies has been mixed, and varies over the course of a lifetime for women (Hewitt et al. 2002). We include marital status here, and we conjecture that it affects labor supply or labor force participation, and, in turn, earnings.</i>
Noeduc	<i>A dummy variable = 1 if no education; 0 otherwise: Education is expected to have a positive influence on earnings. For women in handicrafts, most of them did not have more than primary school education, and hence we wanted to know how their level of earnings affects their earnings. In this case, noeduc is likely to have a negative effect on earnings.</i>
Hand	<i>A dummy variable = 1 if engaged in handicraft; 0 otherwise: This is a dummy that allows us to deal with women whose main occupation is handicrafts. It takes the value of 1 if a woman engages in handicraft making and 0 otherwise. It measures the effect of engaging in handicrafts on income/earnings, holding other factors constant.</i>



Saver	<i>A dummy variable = 1 if has savings; 0 otherwise: This is a dummy that takes the value of 1 if the woman saves and 0 otherwise. It is expected that savings have a positive effect on women's income. This might be due to the ability to acquire inputs and other tools used in expanding production, which, in turn, leads to a higher income.</i>
Inheritall	<i>A dummy variable = 1 if all family members can inherit property; 0 otherwise: This is a dummy that takes the value of 1 if all members of the household can inherit family property, and 0 otherwise. It is expected that inheritance by all members of the household increase earnings as it is an incentive for them to work harder without worrying about losing their wealth.</i>
Sellerhus	<i>A dummy variable = 1 if product is sold by husband; 0 otherwise: This is a dummy that takes the value of 1 if the husband sells the handicraft product, and 0 otherwise. When husbands take care of selling the product, it is expected that it reduces the income of women because husbands misuse some of the money from handicraft sales. In literature, it is documented that husbands tend to spend money meant for the household on activities and goods that are unrelated to household welfare (Waseem 2004).</i>

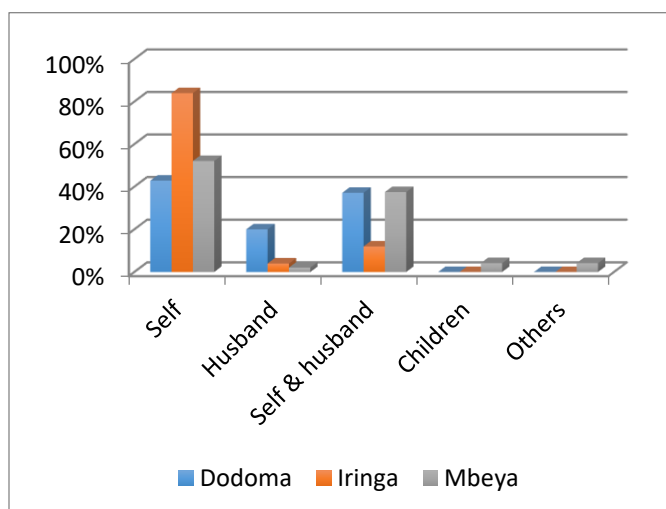
*Note: \*The inclusion of age-squared in regression analysis of earnings of individuals as a covariate allows proper modelling the effect of age on earnings, which may not be linear.*

*Appendix A Table 4: Description of Variables Used in the Model*



*Source: Survey data*

*Appendix A Figure 2: Selling: Handicrafts*



*Source: Survey data*

*Appendix A Figure 3: Selling: Farming/livestock*

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**Appendix Gallery B: Handicrafts Products Made and Inputs Used by Rural Women in Tanzania**



*Appendix B Figure 1: Fresh Mululu for Weaving Mats*



*Appendix B Figure 2: Mululu Set Out to Dry*



*Appendix B Figure 3: Dyed Mululu*



*Appendix B Figure 4: Clay Pots and Clay for Making Pots*



*Appendix B Figure 5: Instrument for Weaving*



*Appendix B Figure 6: Unfinished Basket*





*Appendix B Figure 7: Women Displaying Mululu, Clay Stove, and Baskets*



*Appendix B Figure 8: Woman Inside Her Home, Where She Works*



*Appendix B Figure 9: Women Displaying Their Mululu, Clay Stove, and Showing How Weaving Baskets Is Done*



*Appendix B Figure 10: Man Displaying a Woven Mat (Undyed)*



*Appendix B Figure 11: Man Displaying a Woven Mat (Dyed)*



*Appendix B Figure 12: Finished Baskets and Clay Pot*





*Appendix B Figure 13: Floor Mat and Clay Pot*



*Appendix B Figure 14: Finished Small Basket*



*Appendix B Figure 15: Finished Clay Stove and Basket*



*Appendix B Figure 16: Finished Clay Stoves*



*Appendix B Figure 17: Finished Clay Pot Left to Dry*

## Endnotes

<sup>1</sup> See more at <http://maasaiwomentanzania.com>.

<sup>2</sup> Time poverty is understood to mean that a person does not have “enough time for rest and leisure after taking into account the time spent working, whether in the labor market, for domestic work, or for other activities such as fetching water and wood” (Blackden and Wodon 2006, 6).

<sup>3</sup> We are unable to provide concrete evidence of consumption smoothing since we did not collect monthly data on expenditure and income from the various sources.

<sup>4</sup> Kernel Density Estimation (KDE) is one of the non-parametric ways of estimating the probability density function (pdf) of a dataset, which does not assume any underlying density function but learns the shape of the density from the data automatically (Chen 2017). It creates a smooth curve given a set of data, as opposed to the discrete histogram. The most commonly used kernel is the normal distribution function.

<sup>5</sup> Kurtosis is a measure how peaked or flat a distribution is compared to a normal distribution. Besides being a valid descriptive statistic that defines the shape of the distribution of the data, it is useful in determining how close the data is to a normal distribution, in order for applying common methods of analysis. The value of kurtosis for a standard normal distribution is 3 (Rindskopf and Shiyko 2010).

<sup>6</sup> Data cleaning left us with only 14 observations, which could hardly be used for regression analysis.