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Challenges in Harnessing Indigenous Knowledge Systems through Creation of Employment for Rural Women in Tanzania: The Case Study of Barabaig Leather Products in Manyara Region

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This study examines opportunities and challenges in harnessing indigenous knowledge (IK) for employment creation and poverty reduction in rural Tanzania. The study is underpinned by literature review and descriptive analysis focusing on leather products made by Barabaig women in Hanang, Tanzania. During the study, a sample of one hundred households was selected and interviewed. Data were collected from the administered interviews that were structured like a questionnaire. The literature details the challenges IK faces, including: the threat of extinction due to lack of recording, with much focus on IK that has a direct cash benefit only and the ignored “non-cash” knowledge; considered as part of a residual, traditional, and backward way of life that is easily brushed off on the ground that it cannot be trusted; and not inclusive. The IK drive in Tanzania lacks one unifying policy. Inadequate tanning training, expensive modern tanning inputs, low quality hides and skins associated with poor animal husbandry, poor quality local inputs and tools, low quality output, and lack of markets are among the inhibiting factors faced by Barabaig women using IK to create leather products. Poor roads, inadequate supply of clean water and health services, and lack of electricity is another set of hurdles Barabaig women face. Apart from leather products, Barabaig women also produce other traditional products such as blankets, shawls, bracelets, and neck and waist ornaments. This study argues that Tanzania needs a comprehensive IK policy, and that local governments are better custodians of IK than the central government. There is a need to scale up training on tanning technology, improve animal husbandry, increase the availability of affordable chemical and non-chemical inputs, unlock marketing constraints, encourage producer associations/groups, and address rural bottlenecks such as poor roads, access to electricity, and long distance travel for water and healthcare services.

Keywords: *Barabaig Women, Indigenous Knowledge, Traditional Leather Products, Income and Employment, Rural Tanzania*

1.0 Background and the Problem

Since 2001, Tanzania has experienced revamped economic growth. The economy grew around 7 percent from 2001-2014. The relatively high growth rate over the past 10 years emanated from reform measures adopted since the mid-1980s. The services sector has the largest share in Gross Domestic Product (GDP) — averaged 47.6 percent per annum between 1999 and 2014. The share of agriculture in total GDP has declined gradually since 1999 (29 percent) to 22.9 percent in 2014, while that of the industrial sector has increased from 18 percent to 22.1 percent during the same period. One of the reasons for this shift in composition is that the agricultural sector only grew at 4.3 percent on average over the last two decades, due to low productivity.

Unfortunately, there has been a growth-poverty mismatch in this period, since the impressive growth attained in the past decade or so has failed to address the challenges of inclusiveness, poverty and inequality reduction, and the creation of decent jobs, especially for women and youths in rural areas. One of the critical issues is that the growth quality has failed to address the challenge of structural transformation in terms of employment creation and improved social services. The limited trickle-down effects emanated from the limited growth of agriculture (which is the mainstay of about 80 percent of Tanzanians) and low elasticity of employment in sectors, such as communication, financial services, and construction, that drive the growth of the economy (Mashindano et al. 2013).

Poverty, especially in rural areas, is still high and has increased among unemployed rural women and youth. Between 2000/01 and 2007, the percentage of households in rural Tanzania living below the poverty line only declined marginally, from 38.7 percent to 37.6 percent. Moreover, there is a greater recognition that productive employment and decent work play a key role in promoting inclusive growth and serve as the critical link between growth and poverty reduction.

According to the 2014 Integrated Labor Force Survey (ILFS), the working age population (15 years and above) in Tanzania was about 25.7 million in 2014. Of these people, 86.7 percent were economically active, while 13.3 percent were inactive. The employed economically active population was 89.7 percent, while unemployed¹ was 10.3 percent. The female population led the unemployed and inactive sub-groups by 60.1 percent and 61.7 percent, respectively. In the employed population, paid employees accounted for only 13.9 percent; self-employed workers comprised the largest percentage (86.1 percent). The private sector holds the majority of paid workers (74.5 percent).

In 2006, 93.3 percent of employed persons were working informally; the share decreased slightly to 92.1 percent in 2014 (Table 1). More women than men were engaged in informal employment (96.3 and 90.2 percent, respectively) in 2006 as well as in 2014, when 94.9 percent of employed women and 89.4 percent of employed men were engaged in informal employment. Vulnerable employment rates were also high;

87.1 percent of Tanzania's working population engaged in the more precarious statuses of own-account workers (self-employed) or contributing to family labor workers in 2014². The share of vulnerable employment was as high as 91.1 percent for women (compared to 83.2 percent for men) and 95.5 percent for workers in rural areas (compared to 71.6 percent in urban centers).

The situation is exacerbated by less training of employable skills for women than men — 87 percent of men were reported as likely to get basic education in 2012, but that number was only 76 percent for women (NBS 2012). Moreover, in rural areas women are also typically engaged in pursuit of traditional low productivity activities, such as long walking distances each day to fetch water and collect firewood, (Lardechi 2009) and small-scale farmers are predominantly women (FAO 2011).

	2006					2014				
	Total	Male	Female	Urban	Rural	Total	Male	Female	Urban	Rural
Standard Definition										
Informal Employment*	93.3	90.2	96.3	82.1	97.0	92.1	89.4	94.9	82.5	97.3
Vulnerable Employment	88.6	83.5	93.4	69.3	95.0	87.1	83.2	91.1	71.6	95.5

Source: ILO, 2010 and ILFS, 2014

*Informal employment includes contributing to family workers, own-account workers on own farm, and paid employees and self-employed workers in informal enterprises or household units.

Table 1: Working Population Aged 15 Years and Above by Type of Employment

The apparent item in the labor market indicators in Tanzania relates that employment continues to bring little return to the majority of workers in terms of quality and security, and that women are particularly at a disadvantage. The high percentages of informal and vulnerable employment, especially in rural areas, are of particularly great concern. In combination with a high employment-to-population ratio, this implies that an increasing number of people have to work in low quality and/or insecure jobs in order to make a living. Thus, IK represents possible alternative sources of employment and income generation among the poor rural women and youth. According to Dube and Musi (2002), research on sustainable solutions to the development and technology problems that continue to confront developing countries has led to renewed interest in the potential contribution of IK to research and development activities. Proper application of IK is deemed an appropriate solution for the creation of employment and increases incomes of the rural women and youth.

However, IK has not been properly mainstreamed into development research and policies in Tanzania. It has not been given its deserved weight in development initiatives, despite rural women being the sole custodians of IK. It is against this background that this study attempts to uncover IK challenges and opportunities in Tanzania. The study is organized in four sections. Section two dwells on theoretical and

empirical literature. Section three presents IK in Tanzania, with a primary focus on traditional Barabaig leather products, and includes study methodology, data analysis, findings, opportunities, and challenges. Study conclusion and policy implications are in section four.

2.0 Selected Literature Review

2.1 IK Definition

IK is the basis for local-level decision making in agriculture, health care, food preparation, education, natural resource management, and a host of other activities in rural communities (Warren 1991). The wisdom and skills maintained by keepers of indigenous knowledge are based on a dynamic and sophisticated understanding of their local surroundings. Change in the use of this knowledge is predicated upon conscious efforts by people to define their problems and seek solutions through local experiments and innovation, including evaluating and learning from appropriate technologies elsewhere (Lalonde 1991; Mugabe 1998). Indigenous information systems are dynamic and are continually influenced by internal creativity and experimentation, as well as by contact with external systems (Flavier et al. 1995). IK serves communities, households, and individuals by functioning as a base of knowledge to help process information, to promote efficient allocation of resources, and to help in production decision (Materer et al. 2002).

2.2 Indigenous Knowledge and Rural Empowerment

There are relatively few studies explaining the relationship between IK and employment creation, regarding women in particular. Johnson (2007) explains the relationship in terms of resource utilization, such as IK for the development process. In his study, Johnson reveals that IK is an underutilized resource in the rural development process. He further argues that a majority of people in rural areas, especially women lacking resources, depend on IK to sustain their households and livelihoods since it provides the basis for problem-solving strategies in local communities. In this regard, IK is considered as one of the important inputs for rural household development.

In the same dimension, IK is considered as a possible alternative development avenue among the rural poor. Recognizing the role of IK, the World Bank (1997) emphasizes that development initiatives should start by looking at the local efforts. In this setting, indigenous institutions, indigenous technology, and low cost approaches can enrich the efficiency of development programs because IK is a locally owned and managed resource. Through IK, cost effective and sustainable mechanisms for poverty alleviation that are locally manageable and meaningful can be identified. “Grossly, the role of IK in employment creation and sustainable poverty alleviation can be achieved through increased and enhanced livelihood options, the revived agriculture, increased food security, improved health, and better environment” (Chiwanza et al. 2013). Integration between development assistance and IK improves understanding of local conditions and provides a productive context for activities designed to help the communities; increases

responsiveness to clients; adapts international practices to the local setting; helps improve the impact and sustainability of development assistance; enhances cross-cultural understanding and promotes the cultural dimension of development; and most importantly, can help to reduce poverty (World Bank 1998).

Initiatives to promote IK can be particularly effective in helping to reach the poor part of the population since IK is often the only asset they control, and certainly one with which they are very familiar. Utilizing IK helps to increase the sustainability of development efforts because the IK integration process provides for mutual learning and adaptation, which, in turn, contributes to the empowerment of local communities. Since efficiency, effectiveness, and sustainability are key determinants of the quality of development work, there is a clear case for harnessing indigenous knowledge for use in development (Gorjestani 2000). Moreover, when IK is supported with the right policy and strategy, as well as resources, it provides better services and has been very successful in different parts of the world. For example, in 1996, a collaborative effort in the Iganga district of Uganda, involving the United Nations Population Fund (UNFPA) and Ugandan Ministry of Health, strived to improve communication and transportation links between traditional birth attendants and health posts in order to create timelier referrals and strengthen healthcare delivery. The results of the collaborative effort reduced maternal mortality by more than 50 percent over 3 years (World Bank 2009).

Olatokun and Ayanbode's (2007) study on rural women and IK in Ogun State of Nigeria identifies different types and the extent of IK use and impact on community development. Findings reveal that the majority of rural women were illiterate, but rich in knowledge concerning traditional medicine and the use of oral IK in food production and security, cultural transfer and preservation, saving and money lending, and population control and child care, which all have a positive impact on sustainable development and poverty reduction in Ogun State. In recognizing the role of IK in Tanzania, Mascarenhas (2003) observed in his study that agriculture supports over 70 percent of the population, but that it is a "simple tradition bound subsistence agriculture." The researcher noticed that, in the absence of local and indigenous knowledge, Tanzania would have been much poorer. The study further observes that most communities in Tanzania solve their pest challenges locally. Using traditional healers, some of the communities appear to record success by applying traditional medicine in familiar problems; however, in cases of unfamiliar problems, the impact seems to be catastrophic. The study concludes that both local and indigenous knowledge should be used, and thus a need exists for dedicated efforts to integrate the two.

IK in Africa is gaining ground and space in political, cultural, and academic contexts; however, there remain a host of external and inherent challenges. Mapara (2009) observes that IK is passed on through generations by word of mouth rather than in written form, and, therefore, is vulnerable to development processes, migration, and changes or displacements. There is a lot of focus on IK with direct cash benefit only while "non-cash" knowledge is ignored. For example, there is more interest in medicinal plants, which attract large pharmaceutical industries, compared to studies on traditional dances, rituals, and languages (Msuya 2007). Briggs (2005) observes that IK is too place-specific to be generalized much or

to be developed beyond its areas of origins; considered as part of a residual, traditional, and backward way of life; and non-inclusive differentiations are often by age, experience, wealth, political power, and gender. IK can easily be neglected or brushed off by competitors on the ground that it cannot be trusted (Schroeder 1999; Bell 1979); European epistemology remains central in the African education system (Kazemi et al. 2003; Msuya 2007).

3.0 Indigenous Knowledge in Tanzania

3.1 Initiatives to Promote Indigenous Knowledge

In recognizing the roles of IK — which include among others, being the basis of livelihood for farmers and pastoralists; being the backbone for biodiversity and food security (natural resource management); and supporting rural livelihoods and rural primary health care — Tanzania has mounted substantial efforts in promoting IK. Such initiatives include, among others, ring-fencing IK related issues in national policies, financing and participating in IK related workshops and conferences; establishing the Tanzania Indigenous Knowledge Database; launching a World Bank publication on IK; joining the Local Pathway to Global Development—a program in the Africa region of the World Bank that is aimed at learning from the knowledge embedded in the practices of local communities; and subscribing to IK international conversions such as Rio 1992, where a global consensus was to equitably share benefits arising from the utilization of indigenous knowledge in forest conservation to local communities.

The following policies address sector-specific IK issues in Tanzania:

- i) National Agriculture Policy of 2013 and National Livestock Policy of 2006 — address issues related to agro-production, food security, water conservation, etc.
- ii) National Health Policy (2007) — recognizes traditional healers and birth attendants. Act. No. 23 of 2002 on traditional medicines encourages the improvement of traditional medicine use and control.
- iii) The Wildlife Policy of 2007 — addresses the conservation of indigenous plants and animals on land and sea.
- iv) National Forest Policy of 2008 — stipulates a need for traditional healers to harvest medicinal plants in a sustainable manner.
- v) National Environmental Policy of 1997 — recognizes best local practices on land utilization and conservation.
- vi) Tanzania Social Action Fund (TASAF) issued Draft TASAF III Indigenous Peoples Policy Framework 2012 in which the Hadzabe, Masai and, Barabaig are initially listed.

3.2 Case Study of Barabaig Traditional Leather Gowns and Skirts in the Hanang District

The Barabaig occupy the northern volcanic highlands near Mount Hanang and the Rift Valley in the Hanang District of the Manyara Region. The Barabaig speak Datoga and are 1 of the 2 tribes in Tanzania with the largest number of pastoralists and agro-pastoralist groups. The Barabaig total population was estimated at 50,000 in 2012 (URT 2012). The Barabaig are traditionally semi-nomadic and herd cattle, sheep, and goats; however, over time, they have become agro-pastoralists and now also farm maize, beans, and millet. The Barabaig have, to a large extent, kept their traditional culture and customs, including their traditional way of dressing and their own language. Cattle are an important part of the Barabaig's status, identity, culture, and worldview. According to the Barabaig culture, traditional leather dresses/gowns are worn by all age groups, while traditional leather skirts are for married women only.

The Indigenous Peoples Policy Framework (2012), issued by the government's Social Action Fund (TASAF), recognized the Barabaig as an indigenous people, along with the Hadzabe and Masai. These indigenous peoples have a long and ongoing history of land dispossession and socioeconomic and cultural marginalization. Their dispossession and marginalization have taken place in the name of nation building, agricultural development, and nature and wildlife conservation, but also because policymakers have failed to understand and value the indigenous livelihood systems' crucial contribution to the national and local economy (URT 2012).



Figure 1: Barabaig Women in Traditional Gowns



Figure 2: Barabaig Women



Figure 3: Barabaig Gown



Source: Raymond Foley

Figure 4: Barabaig Men in Traditional Blankets



Figure 5: Producing a Barabaig Traditional Skirt



Figure 6: Barabaig Traditional Product (Vikoi)

The frequency and intensity of drought periods in the northern part of the country, coupled with reduced mobility due to scarcity of land and limited access to natural resources, have increased vulnerability and poverty among the Barabaig community. The sources of poverty include land dispossession, climate change, population growth, increased competition for scarce resources, deterioration of the livestock sector, and the removal of subsidies in all service sectors and extension services during the economic reforms of the mid-1980s. This made livestock rearing, their main occupation, expensive and unaffordable for low income earners. As a result, the Barabaig are forced to look to alternative livelihoods for survival. The situation of girls, children, and women has been worsened by several human rights violations, such as denial of education and other social services, female genital mutilation, early marriages, non-recognition of their legal rights, and domestic violence. Apart from human rights violations, the Barabaig women are exposed to economic barriers, such as transport bottlenecks in their interior rural areas and language problems. These constraints drag Barabaig women and youth further into poverty. Nevertheless, some women have been able to overcome these obstacles by forming small groups and NGOs that enable them to speak collectively and confront relevant authorities in order to unlock their problems with one voice.

Making leather products, such as dresses (gowns) and skirts, among other products, represents efforts made by Barabaig women to add value to hides and skins. Creating these products uses traditional knowledge to surpass rural poverty by creating employment opportunities, increasing income, and reducing food insecurity.

3.2.1 Study Methodology

The study set out with a wide coverage on both theoretical literature and empirical evidences on IK, and adopted a descriptive survey research method on the case study of the Barabaig women's traditional leather products. The population of the study comprised Barabaig women located in Hanang District of

the Manyara Region. The Barabaig ethnic nationality was chosen amongst other ethnic groups in Manyara Region because it has a large population of women with an appreciable use of indigenous knowledge. The random sampling technique was used to select one hundred households.

3.2.2 Data Source and Description

The study data were collected using a structured questionnaire. The questionnaires were administered to 100 households with the help of 4 research assistants and 1 field supervisor in June 2016. The low level of literacy among the majority of the rural women necessitated the use of an interviewer in administering the questionnaire, and, in some cases, language problems were circumvented with the services of Ms. Mary Gitagino who acted as an intermediary and interpreter. The questionnaires were administered in different parts of the Barabaig community in the Hanang District, including the Ming'enyi, Mogitu, Katesh, Endasaki, and Gehando wards (Table 2 shows the specific villages). The respondents were all women, and the number of respondents varied from one locality to the other.

Village/Area	Frequency	Percent
Balangdalalu	14	14
Dawari	2	2
Dirma	19	19
Dumbeta	2	2
Ganana	11	11
Kateshi	11	11
Lamay	3	3
Ming'enyi	27	27
Mogitu	4	4
Mureru	4	4
Muongano	3	3
Total	100	100

Table 2: Responding Rural Communities in Hanang

Gender and Marital Status

Married respondents totalled 70 percent of the respondents, 19 percent were widows, and single respondents made up only 7 percent (Table 3) of the sample. Most of the respondents were the head of their household (76 percent), with only 24 percent of the respondents' households headed by males.

Marital Status	Gender of the Head of Household		Total
	Female	Male	
Single	7	0	7
Married	47	23	70
Divorced	4	0	4
Widows	19	0	19
Total	77	23	100

Table 3: Marital Status and Household Headship

The literacy level was very low among respondents. The results in Table 4 show that a large proportion (60 percent) of the respondents had no formal education. While 28 percent and 10 percent of the respondents had reached, respectively, primary and secondary school levels, only 2 percent had tertiary education. Figure 2 shows that the majority of the respondents were between the age of 31-40 years (28 percent) and 41-50 years (25 percent).

Level of Education	Frequency	Percent
No Formal Education	60	60
Primary School	28	28
Secondary School	10	10
Tertiary School	2	2
Total	100	100

Table 4: Educational Levels of Respondents

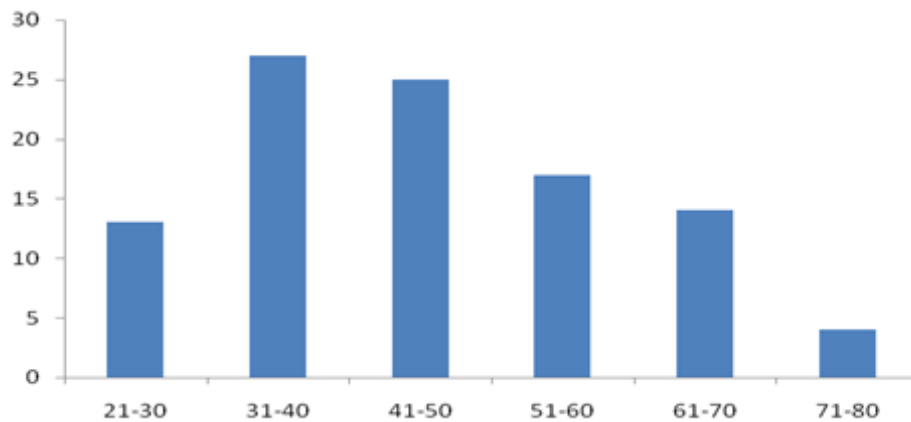


Figure 2: Distribution of Respondents According to Age

Table 5 reveals that the major economic activities among the respondents were crop farming (72 percent), followed by livestock keeping (24 percent), then business had the lowest share at 18 percent. In terms of main occupation, farming, which includes both crop and livestock keeping, had the highest share (82.4 percent), while skin and clothing production was the main secondary activity, scoring 80 percent. Other activities include tailoring, casual labor, building, nursing, and the making of crafts such as bracelets, Barabaig traditional blankets, traditional shawls (sarong wrap), etc.

Economic Activity	Frequency	Percent
Crop Farming	72	63.2
Livestock	24	21
Business	18	15.8
Main Occupation		
Skin and Cloth Making	6	6.6
Farming (Crop/Livestock)	75	82.4
Trader	10	11
Secondary Occupation		
Skin and Cloth Making	56	80
Farming (Crop/Livestock)	11	15.7
Trader	3	4.3

Table 5: Respondents by Economic Activities and Occupations

3.2.3 Data Analysis and Study Findings

Availability of Inputs

The leather manufacturing process is divided into 3 sub-processes: preparatory stage —removing unwanted raw skin components to prepare for tanning; tanning³ and crusting; and finishing — surface coating is applied. This basic traditional skin/hide tanning process is used to tan more than 90 percent of leather worldwide.

Traditional Leather Tanning Process in Barabaig Area

a). Soaking/Washing/Fleshing and Unhairing (Pre-tanning Operations)

Cleaning dried or fresh hides/skins is the first stage where all foreign bodies, such as blood, excess animal fat, and hair are removed from the hides. The dry hide/skin is soaked in salt water to soften it before cleaning. Then, cleaning is done for three to nine days.

The soaked hides are immersed in a mixture of lime (calcium carbonate) and water. Poor households use animal urine⁴ instead of lime as a source of protease. The liming process makes it easy to remove fat, flesh, and hair from hides.

The clean hide is further immersed in a mixture of boiled water and papaya fruits. Papaya fruits are rich in proteases, which are enzymes used for the de-hairing process. These are used instead of chemical de-hairing products, such as lime, which is environmentally unfriendly.

After cleaning, the de-liming process is undertaken by soaking hides in a mixture of water and ammonium sulphate (obtained from industrial fertilizers). This process removes lime from the hide. A successful de-liming process will lead to an absence of pink coloring in the hide, which is determined by applying the phenolphthalein test.

Tools and equipment for the above process are pits or vats/buckets, scrapers, knives, small axes, drying shed, hand gloves, rain boots, fire wood and chemical inputs including lime, papaya fruits, ammonium sulphate, and phenolphthalein.

b). Tanning Stage

The leather tanning process involves soaking clean hides and skins in a mixture of boiled water and mimosa—this will take up to twelve hours. Mimosa is a tanning extract made from the bark of a tree called wattle (*Acacia mearnsii*). Mimosa preserves the tan color that is the hide's natural color.

Ultimately, dyeing can be applied to give the leather color variations such as black, red, brown, etc. Some households find it cheaper to bleach the hides by using brown colored soil, locally called '*lokaria*.'

c). Crusting Stage

This process involves oiling, softening, and drying the leather. The tanned leather is spread with a mixture of boiled oil (any type of seed oil) with soap on the inner side of the hide, while oil is applied only on the

outer side. Then, the tanned hides are stretched in the shed to dry. Lastly, the leather is pressed by using blunt glass before it is ready for use.

It is worth noting that the quality of leather depends on the quality of inputs used and undertaking the requisite tests of each process; however, in the Barabaig area, compliance to these prerequisites appears to be adhered to by few groups or individuals, especially those who produce for commercial purposes.

The Barabaig community still uses traditionally made inputs for tanning skins/hides because these inputs are affordable, but of poor quality, which also compromises the quality of locally produced leather. For example, use of animal urine instead of lime or colored soil during bleaching compromises the quality of leather. Also, tanning requires a lot of water, which is a problem in semi-arid Barabaig land and thus contributes to poor quality leather. Moreover, most households cannot afford to buy all of the necessary tanning tools, such as vats/buckets, scrapers, knives, small axes, hand gloves, etc. Awareness concerning the health impact of chemical inputs is low in the area. Very few producers use protective gear, such as hand gloves and boots, while creating the leather.

However, in improving the skin/hide processing technology, the district, through support from the public organization called Small Industries Development Organisation (SIDO), established a few tanning points, which were put under the custodian of producer groups. SIDO also offers training on tanning and using better chemical inputs, such as mimosa and lime, to group members. Unfortunately, the tanning points are underutilized due to expensive input. Better chemical inputs, such as mimosa, limestone, and oil, which can produce better leather, are available in the regional markets at higher prices that are prohibitive to small-scale producers, or to those who produce for domestic use. It was also observed that in order to improve the quality of leather products, some business women, including producer groups, prefer to procure better quality leather from large-scale tanneries outside the region, such as Himo Tannery and Moshi Leather Factory, rather than producing locally.

Other inputs and tools used to make leather products, such as beads, buttons, needles, sharp knives, scissors, etc., are procured from the local markets within the districts, but there are only two market days a month. As seen in Table 6, local and district markets are the biggest outlets for both chemical and non-chemical inputs, and very few inputs are procured outside the district. The data from the questionnaires shows that despite their poor quality, locally made chemical inputs and non-chemical inputs are widely used. Table 6 shows that 25 percent of respondents use traditionally made chemical inputs, while 52 percent use non-chemical inputs.

	Chemicals	Non-chemicals
Traditionally Made	25%	52%
Nearby Markets	27%	76%
Within the District	20%	60%
Outside the District	3%	20%
Through SIDO	0	7%
Imported	0	0

Table 6: Chemical and Non-chemical Input Sources

Other challenges include fake (counterfeit) inputs; poor husbandry practices leading to quality deterioration of hide/skin due to defects caused by diseases; inappropriately placed brand marks; and damage to skins by thorns, beatings, ripping during slaughter, and inappropriate curing methods caused by inadequate training. Poor storage facilities lead to a rapid rate of spoilage for unprocessed hides and skins, resulting from hot climate in the pastoral areas since most of the households in the area have no access to electricity. Moreover, tanning is considered to be women's work where men are not willing to participate, which overburdens the female members of the household.

The respondents suggested a couple of solutions to the challenges, namely, more training on livestock keeping and tanning; access to cheaper input markets, such as wholesale input markets/shops for chemical inputs like lime and mimosa; exposure to affordable sources of credit; and help in forming commercial groups and cooperative shops for women. Other solutions include construction of a leather factory in Manyara as a source of ready-made inputs, subsidizing the tanning inputs, increasing the market days from two to four each month and complementing local/traditional tanning processes with modern chemical and non-chemical inputs to improve the quality of leather and the leather products.

Production Level

During the interviews, it was noted that the peak production months were between June and November. This period falls after harvesting and thus less farming activities are done at this time. This is important to production since the work of creating leather gowns is considered to be a part-time undertaking for most of the respondents, and, therefore, farm activities are prioritized. However, business women and groups produce leather products throughout the year as long as there is a demand. Table 7 shows the production of Barabaig traditional gowns and skirts. Only 35 leather gowns, 38 skirts, and a jacket were produced a month before the survey, which took place in May 2015. The low production is explained by a number of factors such as: the data for the month of May, which is during the off-season; poor tools, such as traditional needles, slow down the production processes; and a lack of appropriate markets for higher production rates, etc. The interviews revealed the lack of markets, inability to produce quality gowns due

to poor tanning technology, and unaffordable inputs, are some of the reasons why the majority of the respondents produce traditional leather gowns/skirts for personal or domestic use, rather than commercial purposes. It is common for a grandmother to make a gown for her grandchild or a new bride in the family. It can take up to 4 months to finish 1 gown because this is a part-time job and producers use traditional needles instead of sewing machines.

Item	Units
Dresses/Gowns	35
Skirts	38
Jackets	1
Others	101

Table 7: Level of Production in the Last Month (May)

Barabaig business women and groups diversify production in order to increase their incomes. They not only produce leather gowns/dresses, skirts and jackets, but also other leather products, such as different types of decorations, tablemats, handbags, wallets, belts, earrings, necklaces, bracelets, neck and waist ornaments, and cloth/textile products, including Barabaig traditional blankets, traditional shawls (sarong wrap), scarves, and processed skins/hides for sale in the local markets (Table 7).

Producer groups or individuals hire few permanent workers, and most of the work is done on a part-time basis when there is demand or orders. One of the employers in this case is the Barabaig Tradition Cultural Heritage Group (BTCHG).⁵ This is a popular Catesh (Hanang)-based women's group that receives orders from different parts of the country including Kilimanjaro, Arusha, and Dar es Salaam. The group is also active in exhibitions, such as Saba Saba and Nane Nane.⁶ It was also noted that in cases of big orders and when there is not enough time to produce products themselves, the BTCHG procure the goods from small-scale individual producers or groups at an agreed price.

Respondents further revealed that in town centers, there is a growing demand for traditional Barabaig gowns and skirts made of cloth instead of skin/leather. The main consumers are women/girls who live in towns and cities. The traditional Barabaig dresses/skirts made of cloth materials are exactly the same in color and other decorations, but are lighter and good for the warm weather in most of the urban centers.

Production Challenges

Production challenges include expensive inputs (74 percent), followed by lack of markets (69 percent), as well as technology limiting factors (32 percent) and shortage of better chemical products/inputs by 9 percent (Table 8). Other factors that constrain diversification and production include lack of capital and

the inability to capitalize and make other leather products, such as shoes, bags, etc., due to lack of training. Also, poor equipment, low quality skins/hides, and lack of leather sewing machines were cited as inhibiting factors. Old age and poor eyesight due to age were also mentioned as factors by old women.

	Frequency	Percent
Shortage of Chemical Products	9	9%
Technology Limiting Factors	32	32%
Expensive Inputs	74	74%
Lack of Markets	69	69%

Table 8: Current Production Challenges

The major sources of capital were women's savings (52 percent) and loans from friends and relatives (9 percent). None of the respondents had accessed formal lending institutions for capital, mainly due to lack of collateral and a fear of debt; however, some respondents (16 percent) received cash support from NGOs. Only 8.3 percent of the respondents had attended training and received advice on leather processing and producing leather products.

Marketing

The main consumers of traditional Barabaig products are Tanzanians, although a few items are bought by the foreigners or tourists. The main purchasers of the products in the study were final consumers (76 percent), traders (25 percent), cooperatives (14 percent), and middlemen (12 percent). The major marketing channels for Barabaig traditional products were telephone calls and WhatsApp (35 percent), followed by trade fairs, such as Saba Saba and Nane Nane (13 percent). It was noted in the study that 93 percent (80 women) of respondents sold their own products; only 2 respondents were assisted by their husbands.

Major sales or marketing challenges (Table 9) were low prices on the market (52 percent) and distance from the markets (good market segments were not reachable) (52 percent). Other market limiting factors cited by the respondents include: competition from cheap/fake or counterfeit products; some customers not showing up after making orders; being very difficult and expensive to penetrate the trade fair markets due to limited number of slots at the district level; and some customers buying on credit and running away.

	Percent
Price Not Good Enough in the Market	52%
Cheating by Middlemen	9%
Distance from the Markets (Good Markets Segments Not Reachable)	52%
Communication is a Hindering Factor	29%
Low Quality Products	2%

*Table 9: Current Marketing Challenges**Incomes*

Summary statistics for the monthly average incomes from the sales of the traditional Barabaig products are shown in Table 10. The mean income and standard deviation of the Barabaig woman from sales of traditional gowns/skirts were Tanzania shillings (TZS) 143,232.4 (US \$65.30) and TZS 156,418.6 (US \$71.30), respectively.

Percentiles		Smallest		
1%	8,000	8,000	Obs	71
5%	20,000	16,000		
10%	30,000	18,000		
25%	45,000	20,000		
50%	70,000	Largest	Mean	143,232.4
			Std. Dev.	156,418.6
75%	200,000	40,000	Variance	2.450110
90%	360,000	40,000	Skewness	2.036134
95%	400,000	70,000	Kurtosis	7.614298
99%	800,000	80,000		
Exchange rate ended June 2016 (TZS/US \$2,192.40)				

Table 10: Descriptive Statistics of Monthly Average Incomes from Sales (TZS)

Given the mean income and standard deviation, most of the respondents had incomes between TZS 13,186.2 (US \$6.00) and TZS 299,651 (US \$136.70) — an indication of a wide income/earnings gap. Table 10 further shows different quartiles of participants. The first quartile of participants was grouped in income levels less than TZS 45,000 (US \$20.50) per month. The second quartile had income of TZS

70,000 (US \$31.90), while the third quartile registered income of TZS 200,000 (US \$91.20) and the 99th percentile recorded TZS 800,000 (US \$364.90). Income difference between the highest and lowest records is significant.

Employment and Empowerment

The small-scale nature of the activities/businesses, which are mostly family or group-owned, handicaps the employment generation in the sector. As a result, only 13 individuals (11 women and 2 men) are hired by 16 households, which is 16.3 percent of the respondents, and the rest (83.7 percent) do not need hired labor.

The question pertaining to whether participants had any savings indicates that 71 respondents (72.4 percent) had savings in different forms – savings in rural areas can be in cash or kept in a form of physical assets or animals such as goats, sheep, or hens. When it comes to decisions on how to spend the savings and for what purposes, about 85 percent of the respondents have a final say on their savings (Table 11).

	Frequency	Percent
Myself/Female	62	84.9%
My Husband/Male	4	5.5%
Jointly with my Husband	5	6.9%
Marketing	2	2.7%

Table 11: Who Decides When the Savings Will Be Spent and What For?

The responses to questions regarding membership in any organization(s) or group(s) indicate that 56 respondents (58.3 percent) are members in at least one group or organization. Some of the benefits from these memberships include: training (37 percent), sources of capital (31 percent), etc. (Table 12).

	Percent
Source of Capital	31%
Input Supply	9%
Training	37%
Marketing	23%

Table 12: Group/Organization Membership Benefits

Other benefits accrued to the respondents were: access to credit, which is used to solve other family problems like buying food, supporting sick family members, and paying school fees; and support in cases

of catastrophes such as fire, floods, deaths, etc. Responses regarding who is traditionally allowed to inherit land/property or other assets indicate that, just like in most African societies, men take almost everything while women inherit very little (Table 13).

	Frequency	Percent
All Family Members	8	8.2%
Male Family Members Only	73	74.5%
Female Family Members Only	3	3.1%
Children	14	14.3%

Table 13: Who is Traditionally Allowed to Inherit Land/Property or Other Assets

The responses to the questions regarding the contributions of rural women's use of IK for development are presented in Table 14. The highest contribution of income generated through selling leather products to development amongst the Barabaig community was in terms of voice in decision-making (women's empowerment) (54 percent); followed by provision of good health care for the family (43 percent); ability to educate their children (42 percent); and ability to buy food for the family (34 percent). Other benefits accrued from IK income to the respondents include access to clean water (connection charges), acquired solar power, and the ability to build modern houses.

	Frequency	Percent
Ability to Buy Food for Your Family	34	34%
Ability to Educate the Children	42	42%
Ability to Ensure Adequate Healthcare for Your Family	43	43%
Voice in Decision Making (Empowerment of Women)	54	54%

Table 14: The Extent to Which Generated Incomes Affected Their Lifestyle

Succession Plan and Replication

The respondents who have arrangements (succession plan) to preserve and pass on the knowledge to others within the community were 95 percent. The majority opined that it could be done through transferring knowledge to youths (98.6 percent); 29 percent were open to transfer the IK to relatives (29 percent) and interested neighbors, women groups, and disabled people. The respondents (62 percent) favored training, as a better means of imparting the knowledge, attachment to IK practicing households was also anonymous (42 percent) and suggested that girls who are in schools could be attached to IK practicing families or groups during holidays in order to acquire the IK.

In terms of constraints/challenges associated with succession plans, the respondents lamented that as much as they are willing to transfer the knowledge, there is very little support for doing so since the process is costly (64 percent of the respondents), and in the training processes, there is a need for better equipment that they do not have (33 percent). There are also time constraints because most of the girls were attending schools. They posed the following solutions to some of the constraints: introduce training at the primary school level, facilitate access to credit, establish centers for vocational training (including training on IK), support and encourage learning groups, and instill in young people a value for working hard.

The majority of respondents (69 percent) are willing to replicate all or parts of the knowledge to other places or other people. They — 49 respondents (51.6 percent) — further attested that there are no specific cultural traits that could impede the smooth transfer of the knowledge; however, they mentioned some challenges: language problems, girls being reluctant in undertaking handwork, and an inadequate number of trainers.

3.3 Opportunities and Challenges

- (i) Tanzania has sector specific policies on IK, that form a stepping stone for indigenous organizations and supporters to promote IK. Some indigenous organizations have already taken advantage of possibilities offered at the national policy level in terms of participatory consultations and representation in important taskforces. It is now the indigenous communities' turn to make use of the other possibilities, namely engaging and getting their views represented in the decision-making bodies at the village, district, and regional levels. A lot can potentially be gained from the current government move towards industrialization and efforts to revitalize the hides/skins and leather sector through the Tanzania Leather Sector Development Strategy 2016–2020.
- (ii) Ongoing national development efforts (sectoral policies) have one thing in common: the involvement and protection of indigenous knowledge; however, the efforts are quite disconnected. Strategies and approaches need to be defined, along with the rules of engagement, with emphasis on responsibilities of all parties, in implementing IK.
- (iii) The Barabaig women in Hanang can capitalize on the availability of large livestock base in the area to scale up production of leather and leather products. The growing national and international markets in Arusha and Dar es Salaam, as well as demand from tourists in the Northern circuit, if well-tapped, can help to boost production.
- (iv) Defects associated with poor animal husbandry, slaughtering, storage, and preservation methods result in poor quality hides and skins.

- (v) Unavailability of some chemical and non-chemical inputs in the local markets compromises production and quality of leather. Chemical inputs are mostly available in the regional markets at higher prices. Also, counterfeit inputs compromise quality not only in regards to tanning, but also in making leather products.
- (vi) Inadequate tanning training limits the processing of hides and skins.
- (vii) Poor roads and inadequate access to electricity and water hinder production of quality leather due to poor storage and costly transportation in search of inputs. Access to clean water is a serious problem in semi-arid Barabaig land, where one moves long distances in search of clean water.
- (viii) Tanning is the women's job in the Barabaig tribe, which sets men free from tanning and compounds the problem of productivity and quality in hide and skin processing. Women are also occupied with other family tasks like searching for firewood and accessing health services—it is the responsibility of women in Barabaig tribe to send sick family members to the hospital.
- (ix) Less sensitization on the impact of chemical inputs in the environment and health leaves people exposed to environmental pollution and toxic chemicals.
- (x) Constraints in production of leather products, such as gowns and skirts, include expensive inputs. For example, the use of traditional needles (hand-stitch) instead of leather sewing machines along with the inability to produce quality gowns is due to poor tanning technology and lack of markets. Lack of training caused insufficient capital and the inability to diversify other leather products such as shoes and bags.

4.0 Conclusion and Policy Implications

4.1 Conclusion

The study focused on opportunities and challenges in harnessing IK for the creation of employment for rural Barabaig women in Hanang, Tanzania. Indigenous knowledge is a critical factor for sustainable development. IK, like any other knowledge, needs to be constantly used, challenged, and further adapted to the evolving local contexts. Thus, the value of indigenous knowledge presides on its ability to deliver social and economic goods. Certain traditional practices, if popularized and integrated with modern knowledge systems, can help reduce and alleviate poverty.

The study findings indicate that, due to lack of appropriate tanning training and expensive tanning inputs, Barabaig women are forced to use locally made, poor quality inputs and, therefore, produce low quality products. The use of some traditional tools in production compromises efficiency and quality, and thus creates market problems. Lack of markets forced most of Barabaig women to consider production of

traditional leather products a part-time undertaking. In diversifying, business women and groups are involved in making other traditional products such as Barabaig blankets, traditional shawls, bracelets, neck and waist ornaments, etc.

In bridging the gap, Barabaig women need training, especially on skin/hide tanning; access and availability of better inputs and equipment; better production technology; access to market production; and access to affordable credit. They should be encouraged to form groups that will be important links for inputs, production, and markets.

4.2 Policy Implications

In order to harness the IK potentials in Tanzania the following issues should be observed in the creation of policy:

- (i) Address all IK challenges, including adopting one comprehensive IK policy rather than relying on sector specific policies; define the roles of actors; and build human, technical, and physical capacity.
- (ii) Conduct crucial training on tanning technology to improve the quality of leather. Equally important is that training on the making of other leather products, such as shoes, bags, etc., will widen the scope of diversification and scale up rural incomes.
- (iii) Facilitate access to quality and affordable tanning inputs and production tools, such as tanning points and leather sewing machines, to reduce the per-unit production time.
- (iv) Working in groups should be encouraged. Only through groups women can access cheaper credit, cheap inputs through bulk procurement, and market outlets outside the district. Also, most of the NGOs and development partners prefer working with groups rather than with individuals.
- (v) The district authority pillars, such as Tanzania National Business Council, can be used as market outlets outside the district. District authority can reserve more slots for IK products in trade fairs, like Saba Saba and Nane Nane.
- (vi) Address other rural bottlenecks such as poor infrastructure, long distances in search of water, education, healthcare, and upgrading access to electricity.

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Endnotes

¹ Unemployment, according to international standards, is defined as the situation of a person who: (a) did not work in the reference period, (b) was available to take up a job had one been offered in the week prior to the reference period, and (c) actively sought work within the past 30 days (for example, by registering at an employment center or answering a job advertisement) (ILO 2013).

² There is a low likelihood for own-account workers and workers who contribute to family labor to have formal work arrangements and thus are likely to lack elements associated with decent employment, such as adequate social security and a voice at work, which is why the two statuses are classified as vulnerable employment.

³ Tanning is the process of treating skins and hides of animals to produce leather. Tanning hide into leather involves a process, which permanently alters the protein structure of skin, making it more durable and less susceptible to decomposition, and also possibly coloring it. Before tanning, the skins are unhaired, degreased, desalted, and soaked in water over a period of six hours to two days. Crusting is when the hide/skin is thinned, re-tanned, and lubricated.

⁴ The use of a mixture of animal dung and urine is unhygienic and produces a leather with a bad scent.

⁵ Barabaig Tradition Cultural Heritage Group is a women's group formed to promote Barabaig traditions and culture.

⁶ These are very popular annual trade fairs in Tanzania that provide marketing opportunities for producers, including small-scale producer groups and individuals.