

The relevance of indigenous knowledge in conserving natural forests in the face of modernisation: The case of Makete District, Southern Highlands of Tanzania

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Abstract

In pre-colonial Africa, Indigenous Knowledge (IK) was very effective in conserving natural forests because it was free from the current challenges. Therefore, this paper assesses effectiveness and sustainability of IK in conserving natural forests. It also examines the impact of modernisation on IK. The study employed mixed research methods to triangulate information. Thus, the data were collected through in-depth interview, Focus Group Discussions (FGDs), field observation and household survey. The study composed of 242 respondents, of whom 88 respondents participated in in-depth interview and FGDs, whereas 154 respondents participated in a household survey. The study found that IK lost its power hence affecting its effectiveness in conserving natural forests. Modernisation and missionary religion played a central role in weakening the power of IK. It was further found that the relevance and sustainability of IK was questionable because IK faces many challenges, which threaten its existence. Therefore, the study recommends that to ensure the sustainability of IK, there is a need for elders to transfer IK to young generation based on the local environment. It is also imperative for the government to take part in conserving forests owned by clans. This is because IK has lost the power, which contributed in conserving natural forests.

Keywords: Indigenous knowledge, Indigenous people, Modernisation, Forest conservation,

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Introduction

Natural forests are the key environmental resources because they hold a great value in every community worldwide. A landscape without forests will greatly affect human health (Ikeke, 2013). Natural forests play a central role in carbon sequestration and regulating temperature. It also helps in stabilizing the soil (Eneji *et al.*, 2012). The values of natural forests triggered indigenous people to establish mechanisms of protecting forests around their community. Thus, IK was established to regulate the interaction between human and nature (Rim-Rukeh, Ierhievwie & Agbozu, 2013). Njana, Mugasha & Kajembe (2012) admit that the current existing natural forests in Tanzania and other parts of the world resulted from the role played by IK. In Africa and other parts of the world, IK existed since time immemorial and regulated the interaction between people and natural forests (Fadhilia, Liwa & Shemdoe, 2016). In conserving natural forests, IK involves local by-laws, customs, rites, and taboos (Kaya, 2013; Mapara, 2009).

Scholars praise IK for its central role in conserving natural forest. For instance Mwihomeke, Msangi, Mabula, Ylhäisi & Mndeme (1998) assert that in the North Pare Mountains and Handeni District in Tanzania, forests conserved traditionally contain a variety of species which are not found in the surrounding non-traditionally conserved forests. Moreover, in Tanzania and other parts of Africa during pre-colonial period, IK employed taboos, which were connected to traditional religion in conserving natural forests. Taboos operated as the prime factor to guide the conduct of people towards exploitation of natural resources such as forests (Murombedzi, 2003). Some of the taboos still exist to date while others have vanished due to the influence of modernisation and missionary religion (Appiah-Opoku, 2007).

In Tanzania, studies about the role of IK in forest conservation are scant. The few existing studies focussed either in North-eastern or North-western Tanzania. For instance Ylhäisi (2006) conducted a study in Zigua and Gweno ethnic groups found in Tanzania where it was found that there are changes in natural forests conserved traditionally. Correspondingly, Jones (2013) observed that sacred forests in North Pare Mountains contain a variety of vegetations. While there are considerable studies about IK in Northern Tanzania, the southern highlands remained unstudied despite having a diverse of traditionally protected forests (Mgaya, 2020). In southern highlands of Tanzania, there are only two studies, which focussed only on the application of IK in conserving natural forests. The first study was conducted by Njana *et al.*, (2012) to address species diversity in the NyumbaNitu Sacred forest. The second study by Elias (2018) focussed on forest folklore of the *Bena* ethnic group. However, according to Mgaya (2020), while these studies acknowledged the critical role played by IK in conserving natural forests in southern highland of Tanzania, they overlooked documentation on the sustainability of IK in conserving natural forests.

Moreover, in Tanzania the scarcity of studies on the application of IK in conserving natural forests in different communities hinders the formulation of appropriate policies for forest management. Policies which lack interpretation of the dynamics of IK deployed in resource conservation fail to work properly (Mgaya, 2020). Nevertheless, the few studies conducted in Tanzania lack details on how indigenous people manage to conserve natural forests in the face of modernisation. They also tend to overlook focussing on the effectiveness of IK in resource management. Furthermore, these studies have overlooked assessing the sustainability of IK in forest conservation in the changed environment. This trend motivated a need to conduct a study on the relevance of IK in conserving natural forests to fill the existing knowledge gap. The study was therefore guided by the following four questions: how do indigenous people succeed in conserving natural forests in the face of

challenges like modernisation?; how is IK effective in conserving natural forests and to what extent does modernisation affect the operation of IK in conserving natural forests in southern highlands of Tanzania?; and how sustainable is IK in conserving natural forests in the modern world?

Literature Review

In pre-colonial period, IK was very strong and managed to conserve natural forests effectively (Agatha, 2016). Colonisation of Africa marked the onset of power decline of IK in conserving natural resources. According to Mapara (2009), colonialists had a negative perception on traditional systems operated in Africa. African continent was viewed as “a dark continent”, and therefore its traditions were disregarded. Concerning this view, Nyanto (2015) demonstrates that since the past the indigenous beliefs and practices in western parts of Tanzania played a central role in conserving natural resources like land, water and natural forests. However, the introduction of Christianity and villagisation programme marked the beginning of power decline in traditional beliefs and ritual practices. Power decline in ritual practices and traditional beliefs affected human-nature relationship. Despite the fact that African traditional practices were despised, Africans did not lose all their traditions. For instance, the study conducted by Umazi, Iwa & Etim (2013) show that local people continued to obey the traditional rules because such rules were environmentally friendly.

Apparently, the power of IK has declined due to influence of modernisation and other external factors, which were not in force in the past. The influx of foreign religions, poor passage of traditions, and poverty caused degradation of IK (Appiah-Opoku, 2007). Indigenous people employed IK in conserving natural forests because such resources played a central role within the local context and globally (Ikeke, 2013). Ecologically, forests have a number of roles such as

recreation, providing shelter to animals and providing food resources (Eneji *et al.*, 2012). To ensure the sustainability of these roles particularly in Tanzania, the act of conservation has been placed under the legal authority of central government, local government and village government. In collaboration with the local community, the mentioned authorities are responsible for conserving natural forests (United Republic of Tanzania [URT], 1998). In Tanzania and the rest of Africa, natural forests are treated as sacred places and are highly respected, as it is believed that is the dwelling place of ancestral spirits. Despite the influence of modernisation, most of local people in Africa still use natural forests for traditional worshipping (Mangizvo, 2013). However, they are less respected compared to the past. In the past, people protected sacred forests; they could not clear them regardless of being in desperate need of land for settlement and farming (Ikeke, 2013).

Moreover, before the dominance of modernisation, local people applied IK in identifying medicinal plants which were used to heal people and animals (Salinitro, Vicentini, Bonomi & Tassoni, 2017; Elias, 2018). Prior to the introduction of modern knowledge, local people also employed IK in identifying types of soils and the crops to be planted (Lwoga, Ngulube & Stilwell, 2016). Mhache (2018) documented that local people apply local knowledge in preserving food. Despite all the significance of IK, the pace of modernisation has caused modern knowledge to be the dominant approach in conserving natural forests (Mhache, 2018). The forces of modernisation and other external factors are real enemies of IK as explained by Modernisation Theory.

Theoretical Perspective Underpinning the Study

This study was guided by Modernisation Theory propounded by Shmuel Noah Eisenstadt in 1966. This theory explains the progressive transition of the society from traditional to modern ways of doing things. For instance, modernisation changed ways of communicating with God. In addition,

due to modernisation, traditional ways of communicating with God are thrown. This weakens IK in a respective society (Li, 2009). Modernisation forces people to abandon their cherished cultural values and adopt western values (Kasongo, 2010). Nevertheless, according to Mawire (2013), abandoning cultural values is equivalent to throwing away individual's identity. This causes erosion of African indigenous values, beliefs and practices which play a central role in maintaining peace and harmony between people and nature (Kasongo, 2010; Shahzad, Shahzad, Fatima, Hussain, & Shahzad 2015). As it was explained before, modernisation has an influence on traditional society. The theory shows how useful it is with regard to the relevance of IK on forest conservation. Therefore, the theory is very practical as it guides the way how individual knowledge is applied in conserving natural forests and how modernization affects the process.

Materials and Methods

Description of the Study Area

This study was conducted in Makete District in the southern highlands of Tanzania. Six villages with natural forests conserved traditionally were involved (Figure 1). Geographically, the study area lies between latitude 08° 45` and 9° 40` South of the Equator and between longitude 33° 85` and 34° 30` East of Greenwich (URT, 2011). The selection of the study area was based on that it had natural forests, which were conserved traditionally. The fact that in the southern highlands, the indigenous people who still undertake traditional functions like rainmaking and divination reside in Makete contributed the selection of this district. The district has so many diviners who are conducting divination for people with social problems. The study area resides the *Kinga* ethnic group as a dominant ethnic group. This ethnic group among other economic activities engage mainly in farming activities. The other ethnic groups inhabiting the study area are *Bena* and *Wanji*.

In the district, there are high rate of rural-urban migration triggered by shortage of income generating activities.

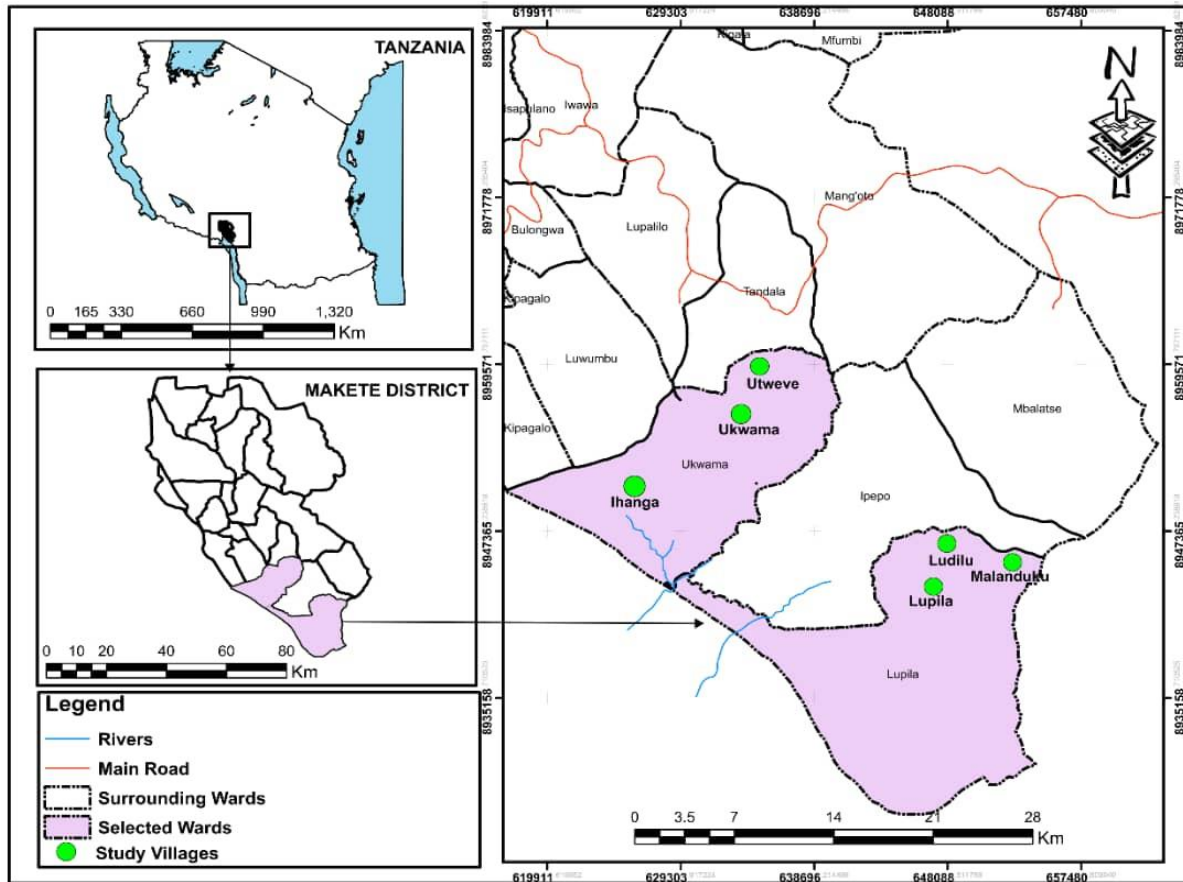


Figure 1: The map of Makete District showing the location of the study area
Source: Adopted and modified from URT (2011)

Communities found in study villages share some commonalities like engaging in farming as a main economic activity. However, communities residing in Lupila Village, Malanduku and Ludilu are involved in planting avocados as an alternative income generating activity. On the other hand, communities inhabiting Ihanga, Utweve and Ukwama deal with some commercial activities as one of their major income generating activities.

Methods of Data Collection, Sample Size, Sampling Procedure and Data Analysis

Primary data were collected through, household survey, in-depth interview, field observation and FGDs. The mixed research methods were employed for triangulation purpose (Creswell, 2014; Almalki, 2016). No method of data collection is self-sufficient in bringing valid and reliable results (Dowson, 2002; Creswell, 2009; Creswell & Clark, 2018). Therefore, through the application of mixed research methods, the weaknesses of each method were counteracted. Moreover, a proportion of 10% was applied to obtain a sample size in which a total of 154 heads of households were selected for household survey through simple random sampling. On the other hand, 60 respondents were selected for FGDs. In-depth interview involved a total of 28 key informants yielding a total sample of 242 respondents. In selecting respondents for in-depth interview and FGDs, purposeful sampling techniques were applied. In these techniques, only respondents with special knowledge on IK were selected. In-depth interview and FGDs were employed to collect data about the perception of people on the role of IK in forest conservation. Issues regarding the power of IK and challenges it faces were collected using questionnaire. Field observation was also employed to collect nonverbal information like the nature and structure of natural forests. Qualitative data from FGDs and interviews were organised into themes and presented by voices or narrations. On the other hand, quantitative data were analysed by Statistical Packages for Social Sciences (SPSS) version 16.0 to produce frequencies and percentages.

Findings and Discussion

This section presents findings on the existence and the power of traditional beliefs and practices in conserving natural forests, the status of traditional beliefs and practices existed in the past, and effectiveness and sustainability of IK employed to conserving natural forest.

The Existence and the Power of Traditional Beliefs and Practices in Conserving Natural Forests

Findings obtained through household survey indicated that 75% of respondents reported that IK has lost its power. On the other hand, 25% of respondents still believed that IK was still powerful (Figure 2). The implication of the findings is that IK is no longer powerful as it was in the past. The power of IK declined due to the influence of modernisation as explained by Modernisation Theory.

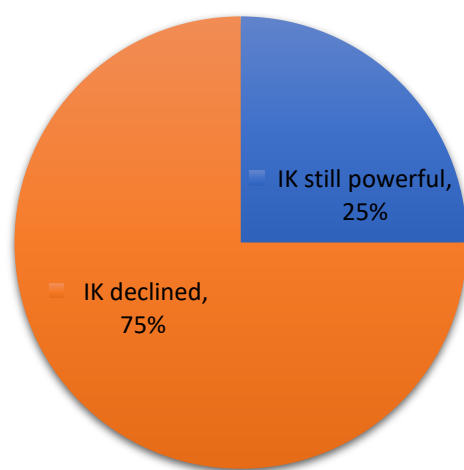


Figure 2: The power of IK in conserving natural forests
Source: Field survey, 2019

One of in-depth interviews with key informants from Ukwama Village indicated that the existence of natural forests depended on the power of IK. Moreover, it appeared that in some of FGDs, respondents claimed that IK has lost power. However, one of the traditional healers mentioned that IK was still powerful in conserving natural forests. Existence of natural forests served as an evidence for the powerfulness of IK. Accordingly, Fadhilia *et al.*, (2016) assert that within the Zigi community of Tanga region in Tanzania, forests used for ritual functions still exist. However, this

is not enough evidence to conclude that IK is still powerful while other communities are no longer conducting traditional functions.

Despite the fact that IK lost its power, some traditional beliefs and practices were still in force. With regard to this, in-depth interviews with key informants in the study area identified rituals, rainmaking, divination and traditional healing as the main traditional beliefs and practices existing in the study area. In terms of the site for conducting rituals, household survey indicated that all (154) respondents mentioned that traditional beliefs and practices were performed in natural forests. Performing traditional functions in the natural forests ensured the security of the forest. It was further indicated that some local people have lost trust on traditional beliefs and practices. To emphasise this one of traditional healers at Lupila Village said:

Nowadays, people have lost trust on traditional beliefs and practices. In the past, local people obeyed traditions of their community because they believed that spirits could punish anyone going against the customary rules. For instance, in the past, circumcised individuals were not attending rituals as it was considered as taboo. Unfortunately, nowadays, few people observe this taboo (Key informant, Lupila Village, 2019).

Based on above statement, it is evident that traditional healers are worried on the current trend about the operation of IK. Furthermore, FGDs indicated that local people stopped conducting traditional functions due to the influence of modernisation and modern religion. Modern religion especially Christianity has contributed in eroding traditional beliefs and practices conducted in natural forests such as traditional worshipping. Majority believe in God not gods, and they worshipped in churches not in forests. With regard to the influence of modernisation and Christianity on IK, Tanyanyiwa & Chikwanha (2011); Kweka (2014) admit that civilisation, modernisation and modern religion shift people from traditional beliefs to modern beliefs. This tendency weakens the power of IK because holders of traditional functions are converted. This concern is well explained by Modernisation Theory. Findings obtained through one of FGDs at

Lupila Village revealed that, Christianity caused depletion of traditionally protected forests indirectly. This was done through converting elders who were the custodians of traditional functions to modern religion.

Moreover, FGDs found that fanatic Christians were against sacredness placed in forests. According to fanatic Christians only a church is treated as sacred place not otherwise. Correspondingly, Kweka (2004) ; Kangalawe, Noe, Tungaraza, Naimani, & Mlele (2014) state that modern religion and civilisation are the main drivers of erosion of ritual activities performed in natural forests. Based on this assertion, in-depth interview with key informants in Ukwama Village found that elders were blaming youths for not attending the traditional functions. The study by Haulle (2014) in the vicinity of Oldonyo Lengai Northern Tanzania also revealed that formal education and the ideal of modern science made youths to abandon cherished tales and myths existing in their community. The indigenous people were changed in terms of attitudes, thoughts and behaviours as they started worshipping only one ‘God’ and not gods as they did in the past.

The study through household questionnaire found that change in attitude contributed in power decline of IK. People especially youths lost trust in functions conducted by elders. Youths view traditional functions as primitive, outdated and are irrelevant in their community. Consistently, Risiro, Tshuma & Basikiti (2013) indicate that in Masvingo Province, Zimbabwe traditional functions are only conducted by elders. Additionally, Asante, Ababio & Boadu (2017) show that in Ghana traditional functions are perceived as old-fashioned, inhumane and barbaric. For that reason, disrespecting traditional beliefs and practices caused IK to lose its power. As youths have less interest in traditional functions conducted by elders in natural forests, there is the possibility of the coming generation abandoning their cherished traditional beliefs, which played a central role in conserving natural forests. On the other hand, in-depth interviews indicated that death of

custodians of traditional matters has weakened IK. In view of this, Obert (2014) upholds that in Gutu District, Zimbabwe IK becomes weak due to death of elders who act as the custodians of traditional beliefs. In any community, elders perform traditional issues. Therefore, the death of elders inevitably implies the death of traditional practices.

The status of Traditional Beliefs and Practices Existed in the Past

Understanding the status of traditional beliefs and practices ever existed in the past. This gave a picture on the sustainability of IK employed to conserve natural forests. Based on FGDs, it was found that in the past there were a number of traditional beliefs and practices, which maintained existence of natural forests. Some of such beliefs and practices are no longer in place while others still exist and are less valued. In other study villages, (Lupila and Malanduku) ritual sacrifices and traditional worshipping received less attention. One of the participants in FGDs said:

Elders are dying with IK because youths are less interested in traditional functions. Youths are modernised to the extent that they do not want to hear traditional beliefs and functions. In the community, those who perform rituals are viewed as witch. I remember an incidence in which one of the holders of traditional practices was killed because people associated ritual sacrifices with witchcraft (Participant in FGDs, Ukwama Village, 2019).

Household survey indicated that indigenous people established various traditional beliefs and practices to regulate interaction between human and nature. The established beliefs helped to conserve natural forests. The participants of FGDs indicated that traditional beliefs and practices helped indigenous people to live friendly with environments. During the period in which IK was very strong, traditional beliefs helped to make people respect and conserve natural forests. As time goes, traditional beliefs and practices that once existed in the past disappear hence threatening the existence of natural forests.

Based on household survey, majority (83%) of respondents reported that traditional beliefs and practices that existed in the past in some communities have disappeared. This implies that some

IK practices are no longer in place in a given society. The remaining 17% of respondents reported that there were no traditional beliefs, which existed in the past, which have disappeared. Respondents in this category were not aware of traditional beliefs, which existed in the past in their community. Participants in FGDs reported that restriction based on working on Thursday and regulating the onset of farming and harvesting has completely disappeared. The details of these traditional beliefs and practices are presented hereunder.

Restriction Based on Working on Thursday

An in-depth interview with traditional leaders at Ukwama Village stated that in the past people were not allowed to engage in any activity on Thursday. This included fuel wood collection in forests. The restriction reduced the interaction between people and forests. Similarly, Umazi *et al.*, (2013) documented that villagers are allowed to enter the forest in market days, which are set in two days a week including Thursday. This minimized the number of people who accessed forest resources because most of them attended the market. The market days were set twice a week, therefore, it was impossible to attend the market at the same time to enter the forest. On the other hand, Asante *et al.*, (2017) found that in Ghana, there are sacred days on which people are restricted from entering the forest. In those days, people believed that gods visit the forest. Hence, absence of people in the forest on taboo days made the forest to be free from human disturbances.

One of the participants in FGDs in Lupila Village emphasised that in the past, all people obeyed the restriction because there were punishments for disobeying customary rules. Nowadays, people do not adhere to such restriction. With regard to this, household survey indicated that 41% of respondents reported that restriction based on working on Thursday has disappeared. Local people believe that working on Thursday will cause animals to attack and destroy crops in farms.

This was insisted by one of the diviners at Ukwama Village who said:

Thursday is a special day for commemorating the death of chief of Kinga ethnic group namely chief Mwemutsi. The cited chief died on Thursday and he was responsible to organise all traditional functions involving Wakinga. Thus, after his death it was announced that no Kingas on Thursday should involve in any activity. Nowadays such restriction is no longer in place it is ignored (Diviner, Ukwama, Village, 2019).

In support of the foregoing statement, field observation showed that, farmers engaged in farming in the restricted day. This implies that beliefs associated with such a day do no longer exist. The disappearance of such belief partly has been caused by modernisation and modern religion. For instance, Christians believe that Sunday is the day of God hence they are not allowed to engage in farming activities. This caused people to disobey restrictions imposed by holders of traditional customs. However, in the literature there is no evidence of specific days in which people are completely not allowed to work as it was observed in the study area.

Ritual Sacrifices on Onset of Farming and Harvesting Season

An in-depth interview with one of the key informants among local leaders indicated that in the past, holders of traditional functions performed ritual sacrifices before the onset of farming and harvesting. Likewise, household survey indicated that 59% of respondents reported that rituals related to onset of farming have disappeared. Farmers were no longer obeying to such restriction, which demanded them to obtain the permission from the holder of traditional functions before they start farming activities. In some of FGDs, it was found that rituals related to onset of farming were not conducted because holders of traditional practices did no longer exist. The absence of individuals to enforce the traditional practices caused local people to abandon rituals. In the past, it was a duty of traditional leaders to announce the commencement of farming and harvesting activities. This enabled farmers to start farming activities timely. This was conducted to control early harvesting which could cause hunger in the respective village. Similarly, Umazi *et al.*, (2013)

found that in Akwa Ibom state, the chief priest is responsible for conducting a sacrifice in the forest during the new Yam festival before the entire community would start eating the new Yam.

An in-depth interview with a traditional healer at Ukwama Village indicated that in the past, before farmers began harvesting, there was a special elder who picked crops from the corner of farms and sent to the chief for rituals. This implies that the first persons to harvest are gods, which protect their land. Farmers believed that ancestral spirits made the soil to be fertile. This kind of ritual was performed in a sacred forest. The practice enabled to conserve sacred forests as they had a special social function. With regard to this, Ombati (2017) states that in Kenya farmers conduct a ceremony before commencement of planting of crops. In the ceremony, seeds to be planted are subjected to special rituals to ensure good harvest of crops. In the current study, field observation found that harvests were sent to the church not to traditional leaders as it was in the past. This was due to the influence of Christianity, which suppressed traditional practices. According to Kweka (2004), modern religion and modernisation erode traditional matters. On the other hand, Kangalawe *et al.* (2014) insist that Western religion is against traditional religion. Everything regarding forest conservation was viewed as outdated. Thus, traditional functions performed in the forest were thrown away. This threatened the existence of traditionally protected forests. With regard to the influence of modern religion on IK, one of the key informants at Ludilu Village had this to say:

Imported religion (Christianity) interrupted traditional religion that was once performed in the forest. Before the coming of white's religion, we used to worship in the forest. Unfortunately, nowadays people worship in buildings, which they call Church. They also send crops to priest instead of sending to the gods of their land (Diviner from Ludilu Village, 2019).

FGDs revealed that despite the disappearance of some of traditional beliefs and practices forests used for rituals still exist. Field observation witnessed existence of forests used for traditional

functions. Existence, of such forests is due to the attached beliefs, which indicate that depleting such forests would lead to death. However, some of the abandoned forests from traditional functions were depleted.

Effectiveness and Sustainability of IK Employed in Conserving Natural Forest

Findings from FGDs indicated that IK applied in conserving natural forests date back since creation and it was very effective. This implies that IK existed since human creation. According to Parrotta (2007), IK was employed in food and service production, which ensured livelihood security in managing natural resources. IK was applied to solve socioeconomic problems facing a respective community. This is an indication that IK served as a tool in decision making in different spheres of life.

In terms of effectiveness, household survey revealed that 79% of respondents claimed that IK was still effective. With regard to this, some of the participants in FGDs mentioned existence of sacred forests as evidence of effectiveness of IK. On the other hand, 21% respondents reported that IK was not effective in conserving natural forests. Variations in responses serve as evidence that IK is no longer effective as it was during pre-colonial Africa. In pre-colonial Africa, IK was effective because it considered the wellbeing of local people (Rim-Rukeh, *et al.*, 2013; Asante *et al.*, 2017). Decline in effectiveness of IK gives a picture that the sustainability of IK is questionable. One of the key informants at Ihanga Village said:

Based on the current existing condition about IK, in few years to come, there is a possibility of losing the knowledge completely. It is surprising to see pregnant women attending ritual practices. Moreover, in the past no sacred forest was encroached, nowadays some of the sacred forests are encroach and depleted. This shows that IK is no longer in control of managing natural forests (Key informant, Ihanga Village, 2019).

Participants in FGDs mentioned modernisation and missionary religion as the newly emerged challenges affecting the effectiveness of IK. The mentioned challenges also threaten the

sustainability of IK employed to conserve natural forests. Based on household survey, it was found that majority (36%) of respondents mentioned modernisation and civilisation as the main challenges affecting effectiveness and sustainability of IK employed to conserve natural forests as shown in Figure 3.

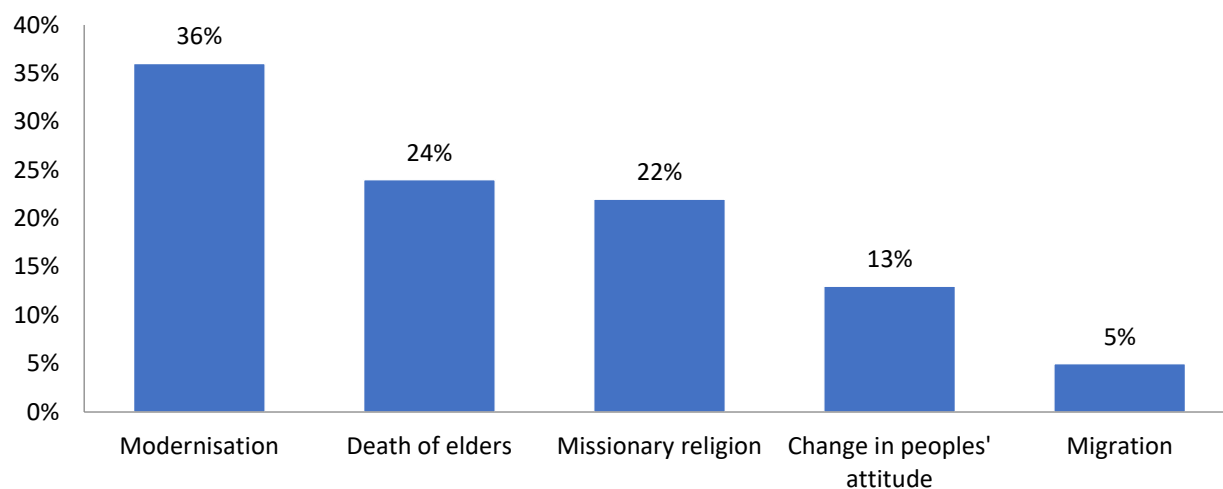


Figure 3: Challenges facing indigenous knowledge in the study area

Source: Filed survey, 2019

One of the traditional healers at Ihanga Village stated that under modernisation, things like urbanisation, media expansion, increased level of literacy, education and industrialisation changed ways of performing various activities. On the other hand, findings obtained through in-depth interview with diviners revealed that media expansion as one of the components of modernisation cause youths and children in villages to spend more time watching Television (TV) than listening stories from elders as it was in the past. Radios and TV also broadcast global contents than local contents. In this regard, one of the participants of FGDs asserted that people glorifies imported cultural values than their own. According to Asante *et al.*, (2017) urbanised environment is seen as a necessary condition for development. This implies that Western civilisation is seen as superior over African cultural values.

In most of villages, indigenous culture has been changed by modernisation and civilisation. This statement was made by one of the participants in FGDs in Malanduku Village. In support of this, traditional healers asserted that most of the indigenous people have been westernised, and they feel proud to be called ‘civilised person’. Due to modernisation African cultural values are considered as primitive, archaic and unacceptable by the civilised community (Arowolo, 2010). Correspondingly, Kasongo (2010) found that civilisation play a critical role in imposing Western cultural values over African cultural values. For that reason, civilisation is a new form of cultural domination in which African culture is seen as valueless and irrelevant. Furthermore, modernisation and civilisation introduced circumcision programmes as a means of reducing spread of sexual transmitted diseases. On this issue, one of the participants in FGDs said:

Nowadays uncircumcised individuals are viewed as uncivilised. In order for someone to be seen as civilised, he should be circumcised. Circumcision programmes posed a challenge to IK. This is because it is against norms and customs for circumcised person to attend traditional functions. Holders of traditions view circumcised individuals as having disability. Unfortunately, most of the youths are circumcised limiting their attendance in traditional functions (Participant of FGDs, Utweve Village, 2019).

Based on the above statement it is evident it is taboo to attend traditional functions for a circumcised fellow. The findings are contrary to what was reported by Kyalo (2013) who found that removal of fore skin of male reproductive organ or clitoris for female allows the blood to flow. The spilled-out blood enables an individual to be connected to the ancestors and the entire community. For that case, circumcision forms an integral part of traditional functions. This implies that circumcision is a necessary condition for an individual to participate in traditional functions. Household survey found that the death of traditional leaders challenged operation of traditional functions. This affected effectiveness and sustainability of IK employed in forest conservation. This was reported by 24% of respondents. Participants of FGDs mentioned elders as the main custodians of traditional functions performed in natural forests. So far, elders are also responsible

for transferring IK to younger generation to ensure its persistence to all generations. Therefore, deaths of elders hinder the transfer of the knowledge to youths. Likewise, Obert (2014) affirms that IK becomes weak due to deaths of elders who are custodians of traditional functions. Correspondingly, Ombati (2017) insists that elderly women perform rituals to seek gods to create rain. This happens in the village when there is shortage of rain. On the other hand, Kiage (2019) asserts that the council of elders make sure that all cultural matters and customary laws of their community are enhanced. In-depth interview with key informants at Lupila village revealed that death of elders led to disappearance of traditional beliefs and practices as part of IK.

Moreover, 22% respondents in household survey reported that missionary religion affected effectiveness and sustainability of IK applied to conserve natural forests as shown in Figure 3. It was reported that in the past, there was only one religion (traditional religion). The introduction of missionary religion interrupted the functioning of IK. Likewise, Shizha (2013) states that African cultural practices have been disrupted by Western belief systems and ways of performing things. Holders of cultural beliefs claim that gods secure their life while congregants of Christ believe that God is everything in life. This created contradictions to most of people; those with weak faith were converted to Christianity. Interview with key informants revealed that emergence of Western religion with massive dominions created pressure to traditional religion. Holders of traditions face challenges from Christians, and sometimes they agreed to be converted to Christianity (Okeke, Ibenwa & Okeke, 2017).

It was further emphasised by one of participant of FGDs in Utweve Village that in the past, indigenous people created sacredness to forests; the current generation respect buildings (churches) as sacred places. This practice affects IK employed in conserving natural forests. According to Ormsby (2013), ethnic religion and cultural values in Meghalaya-India have been

replaced by Christianity. This implies that Western religion is against traditional religion. Modern religions are enemies of African religion (Kangalawe *et al.*, 2014). FGDs revealed that the emergence of missionary religion in the study area caused people to abandon African religion. Likewise, Kweka (2004) avers that modern religion erode traditional beliefs and practices. However, within Christianity, not all dominions act the same on traditional religion. Most of the respondents blamed Tanzania Assemblies of God (T.A.G) as the most challenging dominion to traditional customs.

With regard to this, one of the key informants at Ukwama Village had this to say:

Traditional beliefs and practices are at risk of getting lost due to newly emerged dominions under Christianity. Initially we lived a friendly relationship with congregants of Roman Catholic. This is because some of them attended to traditional ceremonies such as ritual sacrifices for rainmaking. Nowadays, we have the so called born again Christians they tend to know God more than others (Key Informant at Ukwama Village, 2019).

On the other hand, participants of FGDs claimed that Christians under Evangelical Lutheran Church of Tanzania (ELCT) and Roman Catholic (R.C) are not stubborn to traditional beliefs. Christians in these dominions are not very much radical than those from T.A.G. This is contrary to what was reported by Mwihomeke *et al.*, (1998) who found that traditional beliefs and practices of Zigua people in Tanzania are accepted by Muslims than Christians. On the other hand, Sheridan (2015) affirms that some dominions have a friendly relationship with cultural practices. In fact, traditional beliefs and practices are challenged by modern religion. Apart from missionary religion, change in people's attitude was reported to have threatened sustainability of IK in conserving natural forest. This was reported by 13% of respondents. On the other hand, FGDs revealed that most of the villagers especially youths perceived traditional beliefs and practices as something to be performed by elders, poor and uncivilised person. It happened that youths questioned the relevance of ritual sacrifices in solving social problems in the society.

Moreover, findings obtained through in-depth interview with key informants revealed that change in people's attitude caused people to stop participating in traditional ceremonies associated with ritual sacrifices as shown in Figure 3. It was further revealed that elders blamed youths for not showing interest in traditional matter. According to Haulle (2014); Sirima (2015), formal education has caused the youth to abandon cultural beliefs and practices. Likewise, Asante *et al.*, (2017) found that in the study area cultural beliefs and practices received less attention due to change in attitude on such matters. Some of traditional beliefs and practices are dying out. Change in attitude has caused people to seek for scientific justification on matters related to traditional beliefs and practices (Tanyanyiwa & Chikwanha, 2011). This implies that people lost trust on traditional beliefs and practices. If there will be no quick measures, traditional beliefs and practices will vanish.

Finally, household survey found that migration hindered the operation of IK in conserving natural forests. This was reported by 5% of respondents. Although was reported by few respondents but it was insisted by one of the key informants who said:

In this village (Lupila Village) most of the youths migrated to nearby towns Njombe and Mbeya. Others migrated to Dar es Salaam. Some migrated with their parents who were traditional leaders. For that reason, traditional functions are abandoned in the respective clan. Migration also causes cultural erosion as migrants are exposed to different environment with different culture. This causes a migrant to adopt a new culture and abandon his/her own. Most of the youths migrate from rural to urban areas in search of employment opportunities (Key informants, Lupila Village., 2019).

FGDs revealed that migration was highly influenced by lack of economic opportunities. Likewise, Lihawa & Mbonile (1996) affirm that the youth migrate to escape poor economic conditions. On the other hand, Lawi (2013) found that migration in mainly attributed by life hardship and shortage of economic opportunities. In the current study, in-depth interview with key informants revealed that the youth migrated due to huge contributions imposed by the government for developmental purposes such as building schools and rehabilitation of roads. Lyu, Dong, Roobavannan,

Kandasamy & Pande (2019) state that migration serve as a means of getting away from environment with poor living conditions. This implies that migration is one of the survival strategies for youths.

So far, shortage of economic capital and shortage of employment opportunities are push factors, which cause migration among youths. This hinders transfer and inheritance of IK on forest conservation from elders to children. More so, those children and the youth who possessed IK from their parents were unable to apply due to rural-urban migration which created a difficult environment towards forest conservation as it has also argued by Cetinkaya (2009). Correspondingly, Silori (2007) affirms that migration of youths far away from rural to urban areas caused traditional activities to be left in hands of women and old generation. This hinders the progress of IK, as there is no knowledge transfer to the younger generation. The study conducted by Fenetahunmihertu (2018) also revealed that migration disrupted cultural arrangements in the respective clan established by indigenous people. Incidences of migration caused deterioration of traditional beliefs and practices. This implies that migration acts as enemy of cultural values established by indigenous people.

Conclusions and Recommendations

Based on the findings of this work, it is concluded that modernisation and missionary religion affected immensely effectiveness of IK employed to conserve natural forests. Thus, IK is less effective in forest conservation due to newly emerged challenges. Findings revealed that modernisation and missionary religion played a central role in weakening the power of IK. Every aspect of IK was greatly affected by modernisation alongside other factors. For instance, components of modernisation such as media expansion and industrialisation caused indigenous

people to disvalue cherished cultural values of their society. Indigenous people are exposed to new forms of life, which are against traditional forms of life.

It is also concluded that IK cannot be relied in forest conservation because its power has been weakened by modernisation and other challenges. For that case, it is at the risk of disappearing. Apparently, IK has become irrelevant in conserving natural forests. Modernisation alongside other factors caused IK to become irrelevant in conserving natural resources. Modernisation created a new environment, which affects the operation of IK. Nowadays, IK exists as something strange while it is old as the world. On the other hand, scientists view IK as incompatible to modern knowledge in conserving natural forests. Therefore, the sustainability of IK employed to conserve natural forests in Makete district is questionable.

Based on the conclusions, the study recommends the following. It is imperative for the government to take part in conserving forests owned by clans. This is because IK has lost power, which contributed in conserving natural forests. To ensure the sustainability of IK there is a need for existing elders to inform young generation on the value of IK to their survival. This would help young generation to respect traditional beliefs and practices conducted in their society. It is also imperative for elders to inherit the IK to young generation based on the local environment.

Declaration of interests

The author has no known competing financial interests or personal relationships that could have appeared to influence the data reported in this paper.

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