Transforming the Tanzania Charcoal Sector Project and Sustainability of Community Based Forest Management in Kilosa District, Tanzania

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Abstract

This paper explored the impact of the Transforming Tanzania Charcoal Sector Project (TTCSP), on the sustainability of Community Based Forest Management (CBFM) in Kilosa District, using the Ihombwe CBFM as a case study. The study used a qualitative research design. A sample of 47 participants was used to collect data. Purposive and convenience sampling techniques were used to select participants. Data were collected through document reviews, in-depth interviews, focused group discussions and observation. Thematic analysis was used in data analysis. The findings showed that the project has implemented several activities such as capacity building to village institutions, supporting the village land use plan, village resources assessment, and forest harvest plans, training charcoal producers and timber processing groups on modern techniques. Moreover, the Project supported the construction and furnishing of the village office and the development of village by-laws. Furthermore, the Project has strengthened the operationalization CBFM as well as the introduction of a sustainable forest harvest management model. The Ihombwe CBFM has been formalized and made able to generate significant income from forest products such as charcoal and timber. After all these initiatives, deforestation was perceived to decrease thus, ensuring the sustainability of the community forest.

Key terms: Kilosa District, charcoal sector, sustainability, community-based forest management

Introduction

Globally, Community-Based Forest Management (CBFM) started around 1980s as local systems mainly responded to community dissatisfaction about forest destruction (FAO, 2016). In Asia-Pacific, communities were in need to broaden and strengthen rights, including the handling of the forest as resources for livelihood improvement (RECOFTC, 2020). In Latin America, CBFM is seen to have emerged from three aspects namely, grass root pressure, growing global conservation concerns and political opinions about

forest management linked to political devolution (Pacheco, 2019). In some parts of Asia, most forests are under CBFM with some elements of decentralization of obligation for forest administration with limited community rights of ownership (Fisher, 2017). The government retains certain rights by law such as to oversee harvesting operations, collection of royalty payments from the harvest of forest products and distribution of a share to the community (Gilmour et al., 2017). Pacheco, (2019) report that, around 270 million hectares representing nearly 32 percent of all the forests in Latin America, is legally managed through CBFM. Communities have the right to both reap and trade the forest goods (Hagen et al., 2014).

In Africa, before colonialism, communities managed forests and woodlands traditionally by conserving, getting forest products and for grazing. After colonialism, the management of forests was then centralized to enable effective land exploitation by colonial state (Alden, 2018). This was a disincentive to local communities and resulted into conflict (Roe et al., 2019). Larson et al. (2010) point out that the emergence of CBFM has been contributed by the weaknesses in a central system of natural resources control in terms of efficiency and equity. Most CBFM activities in Africa started as donor funded initiatives with resources from international communities (FAO, 2016). The main differences of CBFM systems between Latin America and Africa is that, in Africa the rights for the community to own and manage forests are at government's discretion and can be changed, while in Latin America the rights are based on the recognition of the human right, that indigenous people have the right to possess and manage their own land (Blomley, 2013).

Hersi and Kangalawe (2016) point out that participatory methods in forest administration were introduced in Tanzania in the 1990s as ways of effectively protecting woodlands, in order to prevent the reduced rate of deforestation and intrusion. This was due to the failure of the centralized mechanism or the policing model of forest management to promote sustainable and natural resource in the developing countries including Tanzania (Pulhin et al., 2007). In the 1990s, the government gazetted 9000 hectares Duru-Haitemba forest in Babati as state-owned, as opposed to its original 3000 hectares. The surrounding communities disputed this gazetting through degrading the forest, preferring to gazette it themselves (Blomley & Iddi, 2019). That is why Odera (2009) argues that the development of CBFM in Tanzania was much contributed to by the failure of the forest administration systems run by the central government. As a result of this case, Tanzania launched the decentralized forest management initiatives such as

CBFM and Joint Forest Management (URT, 2017). The main objectives were to improve local livelihoods, conserve and regenerate forests and forest resources, and promote good governance (URT, 2013).

Robinson et al. (2013) argue that by opting to CBFM as a forest conservation tool, Tanzania implicitly recognizes the impact of community actions on forests. All these projects and others popularized the CBFM as one form of participatory forest management. In 2012, the Transforming Tanzania's Charcoal Sector (TTCS) Project was launched. The project was funded by the Swiss Government and implemented by the Tanzania Forest Conservation Group (TFCG) in collaboration with *Mtandao wa Usimamizi wa Misitu Tanzania* (MJUMITA). The main goal of TTCS was to help communities realize the financial benefits of managing forests more sustainably for harvesting charcoal and other forest products through community-based forest management (CBFM) systems (Owen, et al., 2014).

The project also sought to empower communities to benefit directly from the forest resources, thorough a well-functioning CBFM system and profitable forest-based enterprise, such that if communities earn income from charcoal and other forest products, they will be motivated to manage forest resources sustainably, thereby contributing to improved livelihoods, better forest governance, and reduced deforestation (TFCG and SDC, 2015). The TTCS project supported many CBFMs in Morogoro Region. The Community Based Forest Management (CBFM) is a Participatory Forest Management (PFM) system that takes place on community land, or woodlands that are owned or managed by the Village Council on behalf of the Village Assembly, and leads to the establishment of Village Land Forest Reserves (VLFRs), Community Forest Reserves (CFRs) or Private Forest Reserves (URT, 2017). Odera (2009) defines CBFM as a participatory, people-driven forest management system, decentralized to local community institutions, with links to the state and other partners and operating under a legitimate framework for sharing roles, responsibilities, authority, control, costs and benefits.

According to the TTCS project midterm review report from Borsy et al. (2018), communities have been empowered and the income generated from sustainable charcoal (SC) sales, has increased. However, there have been concerns about the status of deforestation and the overall sustainability of the community forest after the implementation of TTCS. This question is a central argument of this paper, and the desires to get answers was necessary. Thus, the paper assessed the impact of the TTCS project on the sustainability of Ihombwe community-based forest management.

Conceptual and Theoretical Facts Underpinning the Study

Conceptual issues underpinning the study include sustainable forest management, and Community Based Forest Management. The two concepts have been used in this study to assess the outcome TTCS project in forest management while theory of change was used to assess the outcome of TTCS project in improving community livelihoods. According to ITTO (1992), sustainable forest management is the process of managing permanent forest land to achieve one or more clearly specified objectives of management, with regard to the production of a continuous flow of desired forest products and services, without undue reduction of its inherent values and future productivity, and without excessive adverse effects on the physical and social environment. Likewise, MCPFE (1993) refers to sustainable forest management as the stewardship and use of forests and forest lands in a way, and at a rate that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems. The guiding objective of the principles of sustainable forest management is to contribute to the management, conservation and sustainable development of all types of forests and to provide for their multiple and complimentary functions and uses. Furthermore, the second principle states that, forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generation (Roe et al., 2019). Therefore, these principles were taken into consideration to determine the extent to which TTCS project was success.

CBFM is one kind of Participatory Forest Management (PFM) system that takes place on community land, on woodlands that are owned or managed by the Village Council on behalf of the Village Assembly and leads to the establishment of Village Land Forest Reserves (VLFRs), Community Forest Reserves (CFRs) or Private Forest Reserves (URT, 2007). Different discourses have emerged with the concept of CBFM. For instance, while Odera (2009) perceives CBFM as a participatory, people-driven forest management system, decentralized to local community institutions with links to the state and other partners, and operating under a legitimate framework for sharing roles, responsibilities, authority, control, costs and benefits, Ceballos (2016) perceives the concept of the CBFM as being "Forest first and community will follow".

Ceballos (2016) moreover, considers CBFM as a decentralized people-driven forest management system which places priority sharing of benefits to the

local communities. Generally, CBFM was established on the basis of an implicit assumption within the modern forest management discourse that local communities, especially those living in rural areas, are largely dependent on forests as their major sources of livelihood and when unchecked, can deliberately contribute to resource deterioration. This discourse ignored the Afro-centric views that local communities or indigenous people have their own practices, knowledge, skills and approaches of environmental management which are environmentally friendly. Therefore, the Ihombwe CBFM in was established and strengthened with support from Tanzania Transforming Charcoal Sector (TTCS), with the aim of ensuring that communities will be motivated to conserve village forest reserves by respecting the village land use plan.

The CBFM approach has been used in different countries globally. For instance, in the Philippines, the government integrated all the CBFM projects into one programme known as community-based forest management program (CBFMP) (Lasco, 2006). The aims of the programme were to protect and improve the rights of the communities to improved environment and access to forests' resources, facilitating the introduction of different technologies in natural forest management such as conservation and development of natural forests, increased tree planting, timber harvesting improvement. CBFMP further provided capacity building by provision of technical and marketing knowledge and skills of forest products (Ceballos, 2016). This means that, the CBFM was mainly focusing on creating incentives and a sense of ownership by the community members, but with less focus on sustainability. To offset this weakness, the concept of sustainable forest management was used to assess sustainability of community forest after the implementation of TTCS project.

In Ethiopia, a forest related initiative funded by JICA, was implemented from the beginning of 2007. This initiative facilitated the communities to agree on the land-use plan and the monitoring of compliance (Takahashi & Todo, 2012). In Malawi, the Blantyre City Fuel-wood Project (BCFP) supported the CBFM through establishment of and capacity building on record keeping, accounting and marketing of forest products (Kalipen & Zulu, 2002). While in Ethiopia the focus was on compliance in the land use plan, in Malawi, the focus was more on marketing the forest products, with an aim to increase income from forest products, with the assumption that the community will get better prices for forest products. This seems to have assumed that, if members of the community get more money from forest products, they will automatically conserve forests.

Theoretically, this paper was informed by the Theory of Change (ToC) which seeks to explain how changes will occur in a community by setting a realistic objective. (Kohlberg & Kinghoffer, 2018). It was first conceptualized by Carolin (1995) who elaborated how and why an initiative works (Stein & Valters, 2016). This theory is essentially a statement which connects between the "if… then", meaning that, projects results are dependent on a certain action (CARE International UK, 2020). The theory of change is diagrammatically presented in Figure 1 below. From Figure 1, inputs are converted into activities, and activities once implemented lead to services being delivered. If services are delivered then there are benefits which are intermediate changes, and if people benefit, then there is a change in their life or systems.

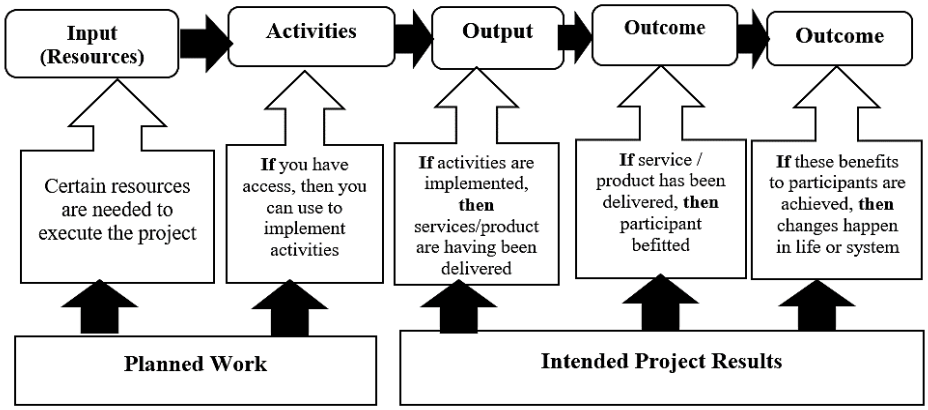

Figure 1: Summary of the Theory of Change
Source: Kohlweg and Ringhofer (2018)

The theory of change is based on two main assumptions. Firstly, the linear relationship between inputs and outputs, that is, outputs lead to outcomes automatically. Secondly, implementation strategies are perfect, no time for creative reflections for further learning. This theory provides guidance on how different programme interventions should be designed and implemented in order to bring about change (Donaldson & Lipsey, 2006). The theory of change helps to define the assumptions that clarify both the intermediate steps that lead to long-term goals and the links between actions and outcomes of projects (Anderson, 2004). Therefore, this theory was used to assess the impact of community-based forest management projects on the sustainability of community forests in order to determine if the projects have enabled the realization of their objectives of ensuring that the needs of the community are

realized without deteriorating the community forests in order to ensure their sustainability.

Methodology

The study was conducted in Kilosa District at Ihombwe village. The district is located in East Central Tanzania with the following coordinates 06°49′48″S 036°59′15″E. Kilosa District was purposefully selected since it is among the oldest districts partaking in the TTCS project. The village is among the eight villages which partook the TTCS project from its onset in 2012. Moreover, the project was both piloted and fully implemented in Ihombwe village for seven years. The selection of Ihombwe village was thus grounded on the assumption that participants from the village are comparatively more insightful and knowledge-enriched with regards to the TTCS project and Ihombwe CBFM experiences.

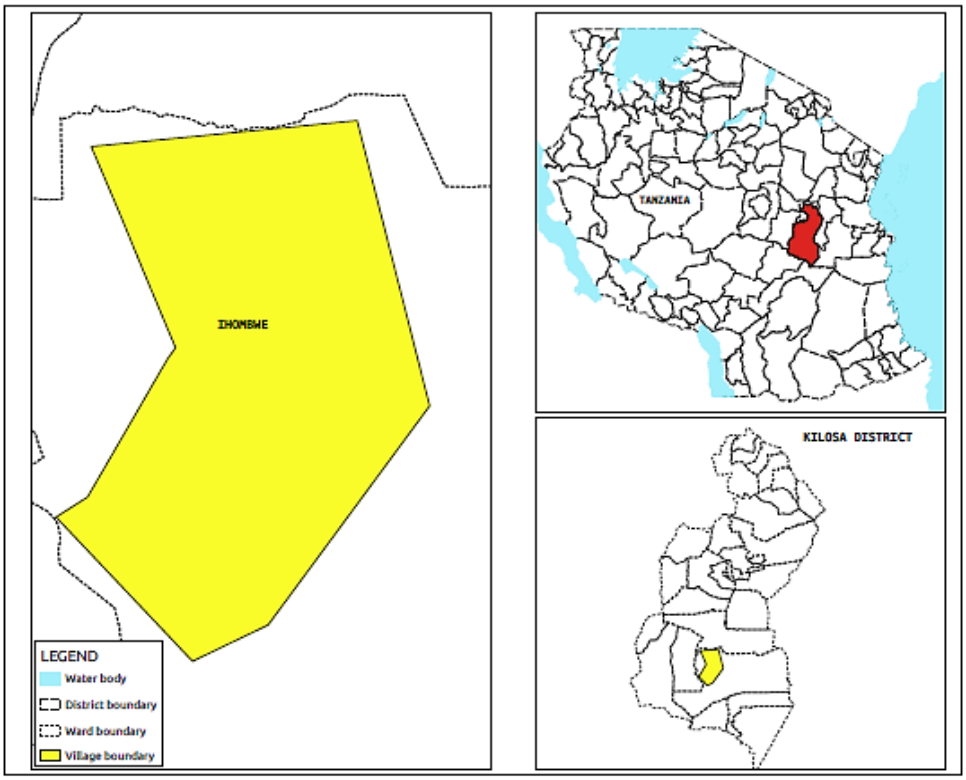

Figure 2: Location of the Study Area
Source: Tanzania Forest Conservation Group, 2020.

The paper used a qualitative case study research design. The study aimed at answering the question of "how" and "why". The main question in this study was "how" the TTCS project has impacted the sustainability of the Ihombwe CBFM. Up to saturation point, total sample size of 47 was used to gather data. These were 3 staff from project implementation unit, 2 Kilosa District staff, 3 TFS staff, 2 charcoal traders, 4 members of Village Council,9 members of the Village Natural Resources Committee, 7 members of Village Land Use Management Committee (VLUMC), 10 members of charcoal producers, five members of timber producers and two charcoal traders. After interviewing 47 participants no new information was obtained from others; it was just a repetition of what had already been stated earlier, so this was considered a saturation point.

Conversely, purposeful and quota sampling techniques ware used to select participants. Purposive sampling involved choosing participants to be used in a study based on their expected completeness and significance of the information to the study question (Yin, 2011). This means knowledgeable individuals were selected in order to learn and yield in-depth understanding. These were individuals who benefited, participated or interacted in the implementation of the project and were perceived to have enough knowledge about the TTCS project. Under quota sampling, the study population were chosen based on the predetermined features to ensure that the sample reflected features of the population and the information collected reflected the community represented.

Key informant interviews were used to obtain information from the key project stakeholders' specifically those who have sound technical knowledge about the TTCS project, the Forest sector and the operationalization of CBFM. The information from these interviews were those related to the TTCS project activities and to the contribution of the project towards the sustainability of CBFM. This was done by using a guiding questionnaire and was administered by the District Forest Officer, TFS Kilosa office, and members of Ihombwe Village council, Programme Implementation Units (PIU) such as TFCG and MJUMITA and representatives of charcoal traders.

Focus group discussions were administered to groups of participants who have similar backgrounds or experiences. In this case, a total of four FGDs with an average size of seven participants each were administered to community members such as members of VNRC, members of Charcoal production group, members of the timber production group and members of the village land use management committee. FGD members were a mix of youth and adult women and men. The aim was to solicit participants'

information on the perceived contribution of the TTCS projects in the sustainability of the Ihombwe CBFM as well as the challenges affecting its performance.

Direct field observation was done to assess the status the community forest after the implementation of the project. The intention was to validate and triangulate information provided by key informants and focus group discussion participants. Document review was used to collect secondary data. This involved reviewing of already collected data, synthesized by others scholars, published and unpublished, concerning the Transforming Tanzania Charcoal Sector and sustainability of community-based forests such as progress reports, deforestation analysis, regeneration analysis and VNRC records.

As stated earlier, this paper adopted qualitative approach and therefore, thematic analysis was used to analyse data. The analysis process involved the familiarization with data, coding and grouping based on themes. Themes were analysed and reviewed based on the research questions and finally findings were presented. Data were presented through descriptive statements and narratives.

Results and Discussion

TTCS Project Activities

It was revealed that the TTCS plays a range of roles in facilitating the implementation of project activities. The key activities were;

Capacity Building to Village Institutions

According to District Forest Officer, the project started by strengthening the capacity of village institutions, which entails the VNRC and VLUMC to enable effective oversight of the management processes of village forest land. These committees were trained on the village land use planning process, the Village Land Act No. 5 of 1999 and the Forest Act of 2002 together with its Regulations, as well as their corresponding roles and responsibilities. The Project Manager emphasized that, these training sessions were viewed as important to start with, in order to set the basis for the establishment of sound Community Based Forest Management systems. According to the CBFM Guidelines (URT, 2017), the Village Natural Resources Committee (VNRC) serves as the overseer of the Village Land Forest Reserve (VLFR) on behalf of the community.

> *"We received various training sessions from the project, including those related to forest policy and laws, village land laws, especially*

> *our rights and responsibilities in the management of village forest land. We did not know these laws before the project. Additionally, few members received training on how to use GPS for forest management"* (FGD with VNRC participant, Ihombwe Village, 2020)

Members of the Village Land Use Management Committee (VLUMC) were also trained on the process of the village land use management to improve their roles in the overseeing of the village land use plan process on behalf of the village council. Training of the committee members was necessary since the committee did not receive any training before the project and some members were new to the committee and as such, they were even not aware of their roles and responsibilities.

Participatory Village Land Use Planning

The results from project management unit indicated that the TTCS project had supported the establishment of the village land use plan. The role of the project was to coordinate all necessary stakeholders and finance the entire land use planning activities and facilities. It was further mentioned that prior to the TTCS project, the village had an outdated land use plan. The same was also noted by the representative of the Ihombwe Village Council. According to the Ihombwe Village Executive Officer through this process the village was able to set aside areas for agricultural activities, settlement, burial, grazing, and other social services, such as schools and health facilities among others. This process also went further by establishing the Village Land Forest Reserve (VLFR). Similar comments surfaced during the FGDs with the VLUMC, VNRC and community members. For instance, one member stated that:

> *"I have been living in this village since 1980.We did have an un-updated village land use plan which was developed many years ago without community participation. It had a lot of challenges. But after the introduction of the TTCS project, everybody in the village is a bit happy and aware of "to do activities" in clearly-specified areas, and all restrictions are almost clear to everyone. This has enabled us also to utilize the existing forest with great care in order to ensure that, we don't overuse its resources"* (Interview with Village Chairman, Ihombwe village, 2020).

> *"I think what has been done by the TTCS project is very commendable work and it should be done in other areas. Now we are living without any fear of our leaders since we have been involved in the*

> *development of village land use plan and most of our concerns have been taken into consideration in the newly developed village land use plan. We know what and where we are supposed to do our activities. This has also helped to reduce illegal utilization of our surrounding community forest known as Ihombwe*." (Interview with community member in Ihombwe Village, 2020).

These findings are supported with Takahashi and Todo (2017) in Ethiopia who stated that, in order to ensure proper management of community forests, members of the community should be involved. This should start from the development of land use plan to ensure incorporation of important needs of the community members. Moreover, Alden (2018) commented that community participation is a very powerful tool for ensuring effective and efficient development of village land use plans.

Village Forest Resource Assessment and Forest Harvesting Plan

The findings revealed that the project financed and facilitated village forest resource assessment and development as well as the village forest harvesting plan. A review of the records from the VNRC, revealed that after the demarcation process, a total of 9,597hectares for the VLFR was established and the village proceeded with specifying land-uses. Moreover, it was revealed that, the project facilitated the village to apportion the VLFR into five zones based on the village forest uses. The main apportioned land-use zones were firewood collection, production of sustainable charcoal, beekeeping, sustainable timber processing, and conservation of biodiversity and water sources.

Moreover, the findings revealed that the project also supported the village to develop forest harvesting plans for both timber and charcoal. For instance, the project facilitated the village to determine the amount of wood stock available for both charcoal production and timber processing excluding other tree species not allowed to be harvested. The project further helped the preparation of harvesting blocks for charcoal from the charcoal FMU by using GPS coordinates to mark the boundaries of the charcoal harvesting blocks with a size of 50x50 meters each. A total of 107 blocks were set to be harvested per year within the set boundaries.

> *"Conversion of Woodstock into number of bags has helped us to monitor annual charcoal harvest plan and to also ensure that we do not exceed the annual allocated quotas. Even with the allocated 107 blocks, we have never been able to exploit them fully per year." (*FGD with the VRNC Members, Ihombwe village, 2020).

However, it was noted that the number of charcoal bags is monitored by the VNRC and Tanzania Forest Service Agency (TFS). The VNRC and TFS were responsible for issuing harvesting licences, whilst observing the annual set limit. This was confirmed during the interview with the TFS representative in Kilosa. Furthermore, the findings indicate that, the project has facilitated the village to hasten the approval of the forest harvesting plans submitted for approval to the Kilosa District Council.

Training of Charcoal and Timber Producers

Responses from key informants revealed that the project has influenced the formation of charcoal and timber processing groups. These groups were then trained. The training was aimed at equipping the producers with the knowledge on the types and sizes of the trees to be cut for charcoal and timber processing as well the techniques on how to best cut the tree in order to enable the stem to regenerate again. They were also trained on how best to avoid cutting trees which are in steep slopes or those that were close to water resources irrespective of their worth. This sought to ensure prevention of soil erosion and to preserve water resources.

Furthermore, charcoal producers were trained on how to prepare and use the modern efficient earth kiln. According to the FGD of charcoal producers, for them, the term efficient kiln, meant modern kilns which are able to carbonize the charcoal well compared to the traditional one. Correspondingly, the modern kilns have higher charcoal yields of high quality which can last longer during cooking compared to the traditional kilns. The charcoal producers were nonetheless not able to explain the reasons for such differences between the modern and traditional kilns. The project analysis estimated that same size of wood volume would yield 30 and 19 bags of charcoal from modern and traditional kilns respectively, while Van Beukering et al. (2007) estimated an efficiency factor of between 20percent and 25percent between the modern kiln over the traditional kiln. Concerning the quality of charcoal, a similar impression was received from the interview with the Dar es Salaam charcoal trader, who trades charcoal from Ihombwe village.

> "*I trade charcoal from different locations of the country such as Tanga, Rufiji and Kisarawe, but the charcoal from Ihombwe is preferred by my customers. They say, it does not easily burn down into ashes."* (Interview with charcoal trader, Dar es Salaam, 2020).

The interview with community members revealed that, as a result of these trainings, the village by-laws, have restricted the timber and charcoal processing to be undertaken only by trained group members. All other

charcoal and timber traders would get harvesting licenses but are not allowed to fell trees and burn charcoal or produce the timber by themselves or hire labourers outside the village. Traders are restricted to use the trained community members within the village. This measure aimed at creating employment opportunities for the individual community members, which in turn was believed would create incentives for individual community members to protect the village forest. This is in line with the challenges put forward by Kajembe et al. (2009) and Kilemo et al. (2014) that the lack of direct benefits to individuals was a disincentive for forest conservation. The norm was that revenue from forest products are recorded at community level and this revenue is used for forest management and investments on community projects and not to individual village members.

Training on Conservation Agriculture

It was noted that, training to community members on conservation agricultural farming techniques through farmer field schools was done. These techniques aimed to maximize the production per area of land whilst conserving the piece of land. As such, shifting cultivation shall be minimized from the extended fertility of the areas farmed. In turn this practice helped prevent the overuse of natural forest (Nafri et al., 2005). Conservation agriculture techniques thought to farmers involves rotational harvesting of forest in order to avoid massive cutting down of trees. Moreover, members were trained crops diversification, this is a process of cultivating more than one species in a given agricultural area in form of crop rotation. This farming practice is very important as it improves soil fertility, structure, water holding capacity and increases crop yields, therefore, this practice reduces forest encroachments to secure land for crop cultivation and hence ensures the sustainability of forest. From the FGD of VLUMC, it appeared that this technique was well accepted by the communities.

> *"After the training in conservation agriculture there were few households that adapted the practice and got the benefit. Currently most of the households have also adopted the practice after seeing its benefits. After understanding principles of conservation agriculture such as rotational farming and harvesting we are no longer encroaching the forest to secure land for agriculture because we are using just small plot to grow our crops yet we are getting high crop yields.* (FGD with members of VLUMC, Ihombwe village, 2020)

> *"The training sessions that we have received from the TTCS project on conservation agriculture have to a large extent helped to reduce massive forest destruction. This is because currently a relatively small*

> *size of land is being cultivated by smallholder farmers than before the introduction of TTCS project. Surprisingly, even crop production has increased despite the cultivation of smaller area. Therefore, currently with this practice, a large forest area is left undisturbed and as you can see, even the number of trees has increased thus increasing their sustainability." (*Interview with community member in Ihombwe village, 2020).

Facilitating the Establishment of the Village By-Laws

The project also coordinated the development of the village by-laws. According to a representative of the VC, this was a lengthy process coordinated and financed by the TTCS. The project created a linkage between the village and the local government authorities. The by-laws were drafted by the Ihombwe village based on the framework of Section 163 of the Local Government (District Authorities) Act of 1982 (URT, 1982). According to the representative of the VC, the by-laws were developed in order to enforce the village land use plan, regulate the community-based forest management including defining offenses and setting up fines and penalties for the respective offenses. These objectives were in line with the narratives provided by Scheba and Mustalahti (2015), that village by-laws are important instruments for the village to enforce their management regimes and penalize criminal offences. Also, the by-laws specify the amount of royalty per bag of charcoal and per piece or metric ton of timber to be paid to village government. This is further in line with the requirement of the Forest Act of 2002 and the National CBFM Guideline (URT, 2017).

Impact of TTCS Project on the sustainability of CBFM

It was observed that the TTCS project has contributed to the sustainability of Ihombwe CBFM. The main contributions noted were increased community awareness on forest management, increased income from forest products to the village government and communities, investment in community development projects and increased investment in the village forest management activities.

Community Awareness on Forest Management

According to VRNC members, the project has created awareness to the Ihombwe village community about the importance of conserving village forest. This is because of the benefits accruing to the village from the VLFR. This was also confirmed by the representative of the VC that it is now possible for every villager to participate in the patrol or to report the village authority if they see any suspected illegal activities. The VC representative further commented:

> *"In the past the villagers were not sensitive about forest conservation. Limited attention was given to using forest resources without thinking about future generations. This trend could have persisted had it not been for the TTCS project intervention."* (FDG with VNRC members, Ihombwe, 2020)

It was noted that there is sufficient forest conservation knowledge among Ihombwe community members. This is epitomised by the fact that illegal harvesters would run upon seeing the patrol team approaching. In the past however, it was revealed that harvesters would be surprised that forest harvesting required permits. According to the VEO, community members seek guidance from the VLUMC before starting any activities on village land. This is done to ensure compliance with the village land use plan. The Kilosa DFO further explained that improved conservation has reduced deforestation in the VLFR. The same was reported by Morgan-Brown (2021).

Increased Income to the Village Government and Community Members

It was revealed that the TTCS was the first project at Ihombwe village which enabled the formalization of the CBFM; it facilitated the creation of a conducive environment both financially and technically to enable proper start of the operationalization of CBFM. It was further noted that, there has been a substantial income flowing into the village from forest products. These incomes were used to invest in other livelihood activities such as small businesses and farming activities thus reduced over reliance of community members on forest resources. During focus group discussions, it was stated that after the introduction of TTTCS majority of community members shifted from using forest resources to other economic activities after acquiring income from CBFM thus increasing the sustainability of the forest. The income generated was divided into two types namely royalty to the village government and the income to the charcoal and timber producers. Hence, it created employment to community members in the forest sector. Table 1bellow indicates that, between the years 2012 to November 2019, the village government has earned a total of TZS 302,617,780 as royalty/fees paid by the charcoal and timber traders while charcoal and timber producers employed by traders earned a total income of TZS 172,505,889.

Table 1: Income from CBFM activities at Ihombwe Village 2012-2019

(Amounts in Tanzania shillings)			
Year	**Sources of Income**	**Fees (royalty) to the Village**	**Income for the Producer**
2012-15	Charcoal	132,905,200	102,151,889
	Timber	-	-
	Total	**132,905,200**	**102,151,889**
2015-2016	Charcoal	7,538,200	9,101,500
	Timber	-	-
	Total	**7,538,200**	**9,101,500**
2016-2017	Charcoal	11,536,000	14,286,000
	Timber	-	-
	Total	**11,536,000**	**14,286,000**
2017-18	Charcoal	24,042,500	28,294,500
	Timber	-	-
	Total	**24,042,500**	**28,294,500**
2018-19	Charcoal	16,613,250	17,972,000
	Timber	109,982,630	700,000
	Total	**126,595,880**	**18,672,000**
Total Income 2012-Nov 2019		**302,617,780**	**172,505,889**

Source: Ihombwe VNRC Records and TTCS Project Monitoring Reports 2012-2019

Investment in the Village Forest Management Activities

The findings show that Ihombwe village by-laws clearly specify how to use the money collected from the forest products. That is 60% of the collection is required to be invested back to the forest management activities while the remaining 40% is for other activities including development project activities to be proposed by the VC and approved by the village general assembly. With regards to forest management activities, the following were the main activities financed by CBFM: village harvest committee meetings, and quarterly supervisory monitoring visit by the District Forest Officer (DFO). The committee meetings sought to discuss the applications for charcoal and timber harvesting and processing from traders. The findings of this study are in line with URT (2017) that the DFO is the environmental watchdog who should oversee progress and problems and determine when to support, step back and intervene if the community is not meeting the forest management commitment it has made. There is an agreed arrangement between Kilosa DC

with Ihombwe CBFM, that the village will cover directly the monitoring cost for the DFO upon arrival to the village to assess their compliance to the procedures including the execution of the village forest harvest plan. The village pays TZS 140,000 per trip of two days to cover the cost for travel and accommodation in the village. The same was seen in the transactions and payment sheet maintained by the Ihombwe VNRC.

Furthermore, the Ihombwe village bought two motorcycles, worth TZS 4,400,000/- to facilitate the patrol activities, and also to enable collect the confiscated materials. One storage facility was constructed for TZS 305,000/- . This facility is for the storage of the confiscated forest products. The leadership of the VNRC (Chairperson, Secretary and Treasury) are each paid an allowance of TZS 50,000 monthly. This allowance was premised on the fact that they spend more time for VNRC activities than other members. Other VNRC members are given a token allowance of TZS 10,000 each for participating in the patrol team. According to the VEO, there are different categories of patrol activities. Therefore, there are different allowances based on the types of the patrol teams. Table 2 presents the types of the patrol teams financed by the Ihombwe CBFM. Therefore, due to these initiatives it was observed that TTCS have contributed much on the sustainability of Ihombwe community-based forest as compared to the status of the forest before the implementation of TTCS project.

Table 2: Types of forest patrol and participants

	Types Patrol	**Participants**
1.	Special Patrol	VC, VNRC, WEO, Division officer and TFS representative and Police
2.	VC And VNRC	VC members and VNRC leaders
3.	Patrol By VNRC	VNRC members, (16 members)
4.	Team Patrol	Community members from the sub-villages.

Source: Interview with VEO, 2020

The findings on the impacts of Transforming Tanzania Charcoal Sector Project on the sustainability of Ihombwe community-based forest correspond with what has been stipulated in the theory of change that aims at bringing improvements to people's livelihoods. This is due to the fact that the TTCS project has managed to achieve its goal on sustainable forest management and improvement of community livelihood. As stated earlier, improvement of community livelihood is the main assumption of the theory of change which explains how changes will occur in a project by setting realistic and

implementable objectives. Moreover, the findings indicated that, TTCs project activities have contributed to the realization of sustainable forest management principles. These principles ensure management, conservation and sustainable development of all types of forests and provide for their multiple and complimentary functions so as to meet social, economic, ecological, cultural and spiritual needs of present and future generations.

Conclusion

In this study, we have shown that the project has strengthened the sustainability of Ihombwe CBFM. Currently the CBFM system is working in such a way that the communities are now aware of how the forest sector is regulated within their village. The TTCS project has facilitated job creation and increased income both to the village and charcoal producers as well as timber processors. The income is being used to support forest protection activities such as forest patrol and harvest monitoring. This, in turn, seems to have created the capacity and incentive for the community to continue to protect their village forest. It is also mentioned that the frequency of land deforestation has decreased, implying that the project has managed to ensure sustainability of the forest. Therefore, this practice should be promoted and adopted to other communities in order to ensure sustainable management of community based forests.

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