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TFCG Technical Paper 49

Implementing charcoal certification in community-based forest management areas in Tanzania

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On behalf of the the project:
Conserving Forests through sustainable, forest-based Enterprise Support in
Tanzania' – CoForEST.

The goal of the project is to achieve a sustainable, pro-community natural forest
management that transforms the economics and governance of the forest products
value chains and contributes to climate change mitigation and adaptation.
The project is designed to achieve its overall goal through three inter-related
Outcomes:

Outcome 1: The capacity of national, regional and local authorities and community
members is strengthened to implement and scale-up CBFM in ways that diversify
livelihoods and reduce deforestation.

Outcome 2: A supportive policy framework and financing mechanism for community
based forest management and sustainable natural forest based enterprises is in
place

Outcome 3: Research and learning institutions in Tanzania are generating new
knowledge about enterprise oriented CBFM and are integrating this in student
learning.

The project is financed by the Swiss Agency for Development and Cooperation and
is implemented by the Tanzania Forest Conservation Group in partnership with the
Tanzania Community Forest Conservation Network (MJUMITA)

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Abbreviations and Acronyms

AFF	African Forest Forum
AHP	Analytic Hierarchy Process
CBFM	Community-based forest management
CBNRM	Community-based natural resources management
CHs	Certificate holders
CoC	Chain of Custody
CoForES	Conserving Forests through sustainable, forest-based Enterprise Support in
T	TZ
CSOs	Civil Society Organisations
CSR	Corporate social responsibility
CSR	Corporate Social Responsibility
DFM	District Forest Manager
DFO	District Forest Officer
DPs	Development Partners
ECSRM	Environmental Corporate Social Responsibility Management
EIS	Evaluation Information System
f2f	Face to face
FBD	Forest and Beekeeping Division
FC	Forest certification
FGDs	Focus group discussions
FM	Forest Management
FMUs	Forest management units
FORVAC	Forestry and Value Chains Development programme
FSC	Forest Stewardship Council
LGAs	Local Government Authorities
MCDI	Mpingo Conservation and Development Initiative
MDAs	Ministries, Departments and Agencies
MJUMITA	Tanzanian Community Forest Conservation Network
MNRT	Ministry of Natural Resources and Tourism
MSLP	Multi-Stakeholder Learning Platform
NFSS	National Forest Stewardship Standards
NGOs	Non-governmental Organisations
PESTEL	Political, Economic, Social, Technological, Environmental and Legal
PFPII	Private Forestry Program II
PO-RALG	President's Office - Regional Administration and Local Government
PPRA	Public Procurement Regulatory Authority
SCP	Sustainable Charcoal Production
SD	Sustainable development
SDC	Swiss Agency for Development and Cooperation
SDGs	Sustainable development goals
SIDO	Small Industries Development Organisation
SLIMF	Small and Low-intensity Managed Forests
SMEs	Small medium enterprises
SUA	Sokoine University of Agriculture
SWOC	Strengths, Weaknesses, Opportunities and Challenges
TANWA	
T	Tanganyika Wattle Company
TFCG	Tanzania Forest Conservation Group (TFCG)
TFS	Tanzania Forest Service

TIRDO	Tanzania Industrial Research and Development Organization
VC	Value chain
VC	Village Council
VLFRs	Village Land Forest Reserves
VNRC	Village Natural Resources Committee
VPO-DoE	Vice President's Office - Division of Environment
WWF	World Wide Fund for Nature

Executive Summary

The analytical objective of this study is to assess the implementation of charcoal certification on the ground to generate new knowledge about charcoal enterprise-oriented community-based forest management (CBFM) through forest certification (FC). Specifically, the study addresses four objectives: a) To assess the feasibility of linking Forest Stewardship Council (FSC) National Forest Stewardship Standards (NFSS) with Tanzania Bureau of Standards (TBS) compulsory standards with a detailed focus on the charcoal value chain (institutions, processes); b) To investigate and present options for a TBS standard on charcoal kilns, production, quality and species for sustainable charcoal production; c) To assess the feasibility and profitability of applying of TBS Standard TZS1312:2010 to sustainable charcoal produced in the Conserving Forests through sustainable, forest-based Enterprise Support in Tanzania (CoForEST) project area; and d) To recommend measures that could be taken by the CoForEST project partners and other stakeholders to promote progress on charcoal certification to support socially inclusive and ecologically sustainable charcoal value chains. Document review, stakeholders' consultation and field surveys, as well as PESTEL-SWOC analyses were deployed for this assessment. Data and information were analysed using qualitative methods and A'WOT quantitative analysis, which is a combination of Analytic Hierarchy Process (AHP) and Strengths, Weaknesses, Opportunities and Challenges (SWOC) analyses.

Linkage between FSC NFSS voluntary standards and TBS standards provides strength to the implementation of certification. When the NFSS is gazetted by TBS, it will be linked to other TBS standards such as TZS473:2019 & TZS1312:2010 to improve the charcoal value chain performance. The TBS standard on charcoal kilns, production, quality and species is inevitable to enable charcoal producers to produce charcoal that meets the minimum requirements for household use for both domestic and export markets. It is important that the standards are developed to provide incentives for sustainable charcoal production (SCP).

The lump charcoal tested did not meet the required qualities as per TBS Standard (TZS 1312:2010), and hence unsuitable for household use. One of the possible reasons for low quality is inadequate carbonization. For the charcoal producer groups to qualify for FSC and TBS certification, quality parameters should be met. However, the implementation of charcoal certification in CBFM areas in Tanzania can proceed with FSC - NFSS and TBS (TZS1312:2010) standards as per prescribed fundamental measures presented in the action plan. It was revealed that there are more opportunities than challenges to the implementation of charcoal certification. This justifies why certification of charcoal and other forest produce should proceed.

The sector can capitalize on the prevailing opportunities to mitigate the challenges, and using the current strengths to lift up the weaknesses and hence strengthen the implementation of charcoal certification on the ground in Tanzania. It is recommended that three charcoal producer groups Village Land Forest Reserves (VLFRs) in Kilosa district i.e., Ulaya Mbuyuni, Chabima and Kitunduweta villages be considered for certification as a pilot project for capacity building in supporting socially inclusive and ecologically sustainable charcoal value chains. During the implementation of charcoal certification, these standards (FSC and TBS) should be linked to leverage each other's merits and hence maximize environmental, social and economic benefits to producers, contributing to sustainable development to local community and the national at large.

1. Introduction

With financial support from the Swiss Agency for Development and Cooperation (SDC), the Tanzania Forest Conservation Group (TFCG) in partnership with the Tanzanian Community Forest Conservation Network (MJUMITA) is implementing the CoForEST project. The project's goal is to achieve a sustainable, pro-poor community natural forest management that transforms the economics and governance of the forest products value chains, including charcoal. Research to generate new knowledge about charcoal enterprise-oriented CBFM through FC is one of the expected outcomes of the project.

Charcoal is an odorless, tasteless, fine black powder, or black porous solid consisting of carbon, and any remaining ash¹. It can be produced from wood and other biomass types in a process called carbonization, which is the method of burning wood or other biomass in the absence of air after which it breaks down into liquids, gases and charcoal². Charcoal and other traditional fuels are the main energy sources in Tanzania³, ⁴ (Figure 1), mainly in urban areas⁵.

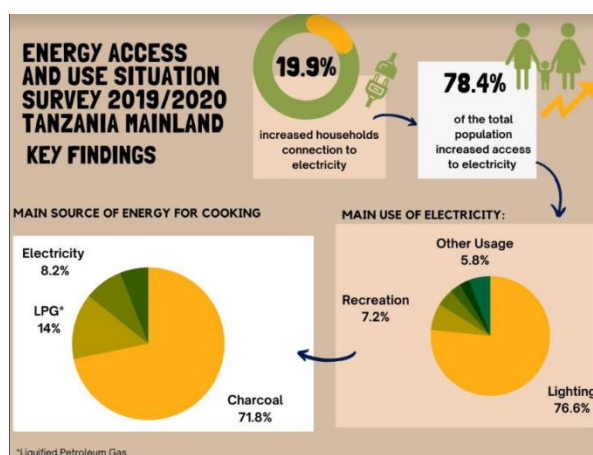


Figure 1: Some highlights from the energy access survey 2019/20⁴

As Tanzania's population is rapidly growing and urbanizing, total demand for charcoal is expected to double by 2030 from the 2010 demand estimates⁶. Despite the presence of a policy promoting alternative sources of cleaning cooking energy, there has been little change in the proportion of urban households using charcoal, over the last 30 years⁷.

Charcoal trade is a lucrative business with many beneficiaries along the value chain⁸. In Tanzania, the charcoal sector is a major employer and contributes over US\$ 650 mn annually to the national economy⁹. However; the majority of the actors in the sector are informal and

¹ UN Food and Agriculture Organization, 2015. *Industrial Charcoal Making* [Online].

Available: <http://www.fao.org/docrep/x5555e/x5555e03.htm>

² John Vos, Martijn Vis. 2010. Making charcoal production in Sub Sahara Africa sustainable. BTG Biomass Technology Group BV, Netherlands.

³ NBS.2017a. Energy Access Situation Report, 2016. Dar es Salaam, Tanzania: National Bureau of Statistics

⁴ NBS, 2020. Energy Access and Use situation in Tanzania Mainland 2019/2020. REA

⁵ MEM, 2014. Ministry of Energy - Biomass Energy Strategy (BEST) Tanzania: Tanzania Biomass Energy Strategy and Action Plan. CAMCO Clean Energy (Tanzania) Limited. Final Report

⁶ FAO, 2011. Review of food and agricultural policies in the United Republic of Tanzania

⁷ Doggart, N., etal, 2020. The influence of energy policy on charcoal consumption in urban households in Tanzania. *Energy for Sustainable Development* 57, 200–213. <https://doi.org/10.1016/j.esd.2020.06.002>

⁸ Babatunde, T., etal, 2019. Profitability of Charcoal Production and Marketing in Ibarapa Zone of Oyo State Nigeria. *Asian Journal of Agricultural Extension Economics & Sociology*, 35(3): 1-7. DOI:10.9734/ajaees/2019/v35i330226

⁹ World Bank, 2010. Enabling Reforms: A Stakeholder-Based Analysis of the Political Economy of Tanzania's Charcoal Sector and the Poverty and Social Impacts of Proposed Reforms

unregulated¹⁰, and is associated with a number of problems including unsustainable biomass production (forest degradation), air pollution and widespread evasion of forest royalties¹¹. Due to its informal nature, over US\$ 100 mn in tax revenues are lost¹².

1.1. CBFM: Ideal Approach for Sustainable Charcoal Production

The SCP in CBFM areas in Tanzania has demonstrated a remarkable success¹³. Moreover, CBFM has been considered most effective because it provides sufficient incentives for communities to participate in long-term forest management¹⁴. The CBFM has improved management of unreserved forests because villagers own the land and retain full rights to benefit from natural resources¹⁵. The CBFM demonstrates to meet all the set of key characteristics for the operationalization of community-based natural resources management - CBNRM (Figure 2).

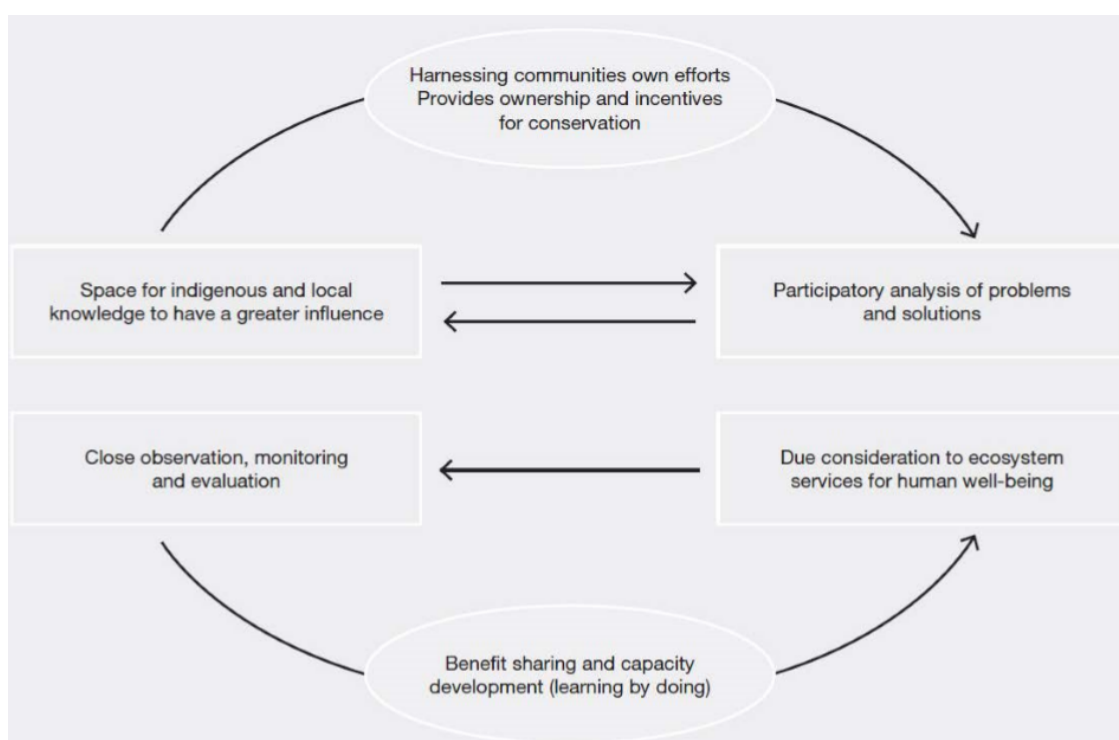


Figure 2: Characteristics of community-based natural resource management¹⁶

Despite that CBFM in Tanzania has been qualified successful, value addition to improve the value chain (VC) of forest produce has not been optimal in addressing the sustainable development goals (SDGs)¹⁷ (Figure 3).

¹⁰ MNRT, 2018. Assessing Potential and Identifying Optimal Strategies for National Charcoal Sub-Sector Development in Tanzania. Draft report.

¹¹ Zorrilla-Mirasa, etal, 2018. Environmental Conservation and Social Benefits of Charcoal Production in Mozambique. *Ecological Economics* 144:100-111.

¹² Doggart, N., etal, 2020. The influence of energy policy on charcoal consumption in urban households in Tanzania. *Energy for Sustainable Development* 57, 200–213. <https://doi.org/10.1016/j.esd.2020.06.002>

¹³ Doggart, N. 2016. A review of policy instruments relevant to the integration of sustainable charcoal production in community based forest management in Tanzania. Tanzania Forest Conservation Group Technical Paper 51. Dar es Salaam. P. 56

¹⁴ Blomley, etal, 2009). Participatory forest management in Tanzania: 1993– 2009: Lessons learned and experiences to date

¹⁵ Stringer, etal.2018. Chapter 6: Options for governance and decision-making across scales and sectors. In IPBES (2018): The IPBES regional assessment report on biodiversity and ecosystem services for Africa. pp. 480–587.

¹⁶ Stringer, etal.2018. Chapter 6: Options for governance and decision-making across scales and sectors. In IPBES (2018): The IPBES regional assessment report on biodiversity and ecosystem services for Africa. pp. 480–587.

¹⁷ Camco 2013. Market research for sustainably produced charcoal. TTCS Technical Report 1. 1- 146

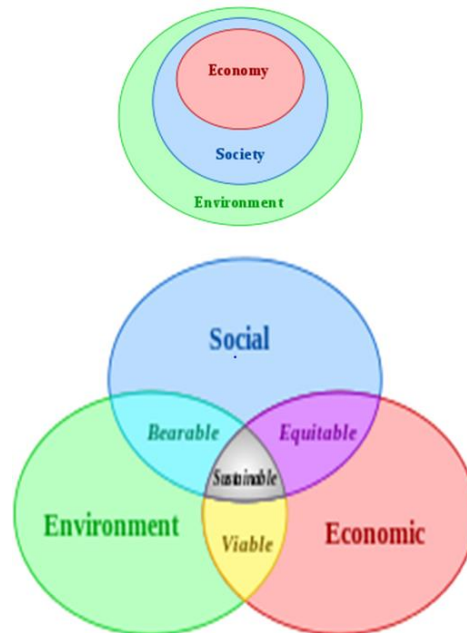


Figure 3: 'Mainstreaming' sustainable development (SD)¹⁸

Mainstreaming SD typically urges the maintenance of ecological integrity; the integration of environmental care and development; the satisfaction of, at least basic, human needs for all; Utilitarian conservation; concern for inter-generational, inter-group and inter-species equity; the application of science, technology and environmental knowledge to world development; the acceptance of some economic growth (somehow without exceeding environmental limits); and the adoption of a long-term view¹⁹.

1.2. CBFM: Agriculture-Forest development Nexus to achieve SDGs

Recent research findings have established scientific facts that agriculture development is the main cause of deforestation (see e.g., ^{20, 21, 22}). Agricultural expansion drives almost 90 % of global deforestation²³, compromising the attainment of SDGs in all fronts. In Tanzania agricultural contributes to about 89 % of deforestation²⁴. To achieve the prime goal of SDGs holistically, the interventions should aim at balancing nature and people needs, while meeting the desired profits ecologically, socially and economically at scale (Figure 4). These fundamental goals should be delivered concurrently with those aiming at environmental protection (climate change, life on land, life in water), and those dealing with human development deficits, especially where they relate to forests, forest margins and rural areas²⁵.

¹⁸ <https://rashidfaridi.com/2017/11/23/four-pillars-of-city-sustainability>

¹⁹ Dunphy, et al, 2000, Sustainability: The corporate challenge of the 21st century, Allen & Unwin, New South Wales, Australia, p. 23

²⁰ Duggart et al. 2020. Agriculture is the main driver of deforestation in Tanzania. Environ. Res. Lett. 15: 034028

²¹ FAO, 2020. FAO Remote Sensing Survey: <https://www.fao.org/forest-resources-assessment/remote-sensing/fra-2020-remote-sensing-survey/en/>

²² van Noordwijk et al, 2021. Introduction: Ten Years of Forests, Trees and Agroforestry Research in Partnership for Sustainable Development. Highlight No. 1. Bogor, Indonesia: The CGIAR Research Program on Forests, Trees and Agroforestry (FTA).

²³ FAO, 2020. FAO Remote Sensing Survey: <https://www.fao.org/forest-resources-assessment/remote-sensing/fra-2020-remote-sensing-survey/en/>

²⁴ Duggart et al. 2020. Agriculture is the main driver of deforestation in Tanzania. Environ. Res. Lett. 15: 034028

²⁵ Katila P, Colfer CJP, De Jong W, Galloway G, Pacheco P and Winkel G. eds. 2019. Sustainable development goals. Cambridge, UK: Cambridge University Press

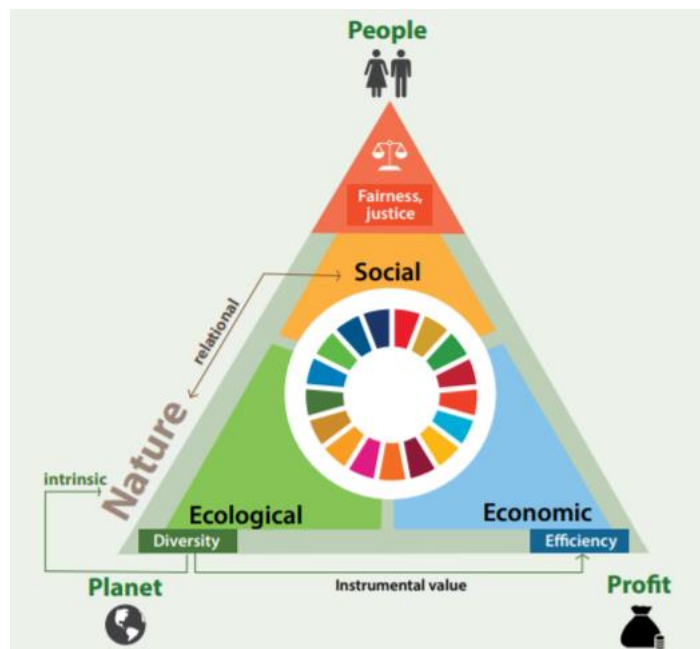


Figure 4: The triple bottom line of planet, people and profit as reflected in the SDGs and in the instrumental, relational and intrinsic values of nature to people²⁶

At community level, the heart of this balance of goals is anchored in CBFM. The CBFM approach can be seen both from the perspective of agriculture and from that of forestry through effective implementation of land use plans. Additionally, from the perspective of forestry, CBFM offers people the opportunity to leverage the extremely wide diversity of tree and non-tree genetic resources originally found in forests in order to shape diverse, productive systems that can co-exist in harmony with forests, within landscapes²⁷.

In terms of policy and legal framework, one of several differences between *agriculture* and *forestry* in most institutional traditions is the separate roles of associated ministries. For forestry, the challenge comes from a confrontation of competing social and economic agendas. The sector is on the one hand a *landlord* of a social agenda (dealing with the *rich forest, poor people* syndrome, and the critical issue of local communities), but forests on the other hand play a critical role as income earners for the state's development agenda, through logging concessions and other ways to extract forest rents.

The environmental agenda seen by ministries as externally imposed and a threat, but it can help in finding a new rationale for maintaining forests under public and community control as providers of water, conservers of biodiversity and resources for mitigating climate change. Since the Rio conference in 1992, new contexts and objectives led to the sustainable development agenda, and in many ways called for more integrated responses, not siloed, to halt deforestation, among others. One of the approaches emerged since then was the FSC forest certification standards.

²⁶ van Noordwijk et al, 2021. Introduction: Ten Years of Forests, Trees and Agroforestry Research in Partnership for Sustainable Development. Highlight No. 1. Bogor, Indonesia: The CGIAR Research Program on Forests, Trees and Agroforestry (FTA).

²⁷ van Noordwijk et al, 2021. Introduction: Ten Years of Forests, Trees and Agroforestry Research in Partnership for Sustainable Development. Highlight No. 1. Bogor, Indonesia: The CGIAR Research Program on Forests, Trees and Agroforestry (FTA).

1.3. Certification and Standards

Certification is a process of controlling particular aspects of a system to provide some guarantee to outsiders that the system complies with an agreed set of rules²⁸. The FSC certification system, among other roles, is a tool to implement the SDGs²⁹. It has been globally accepted as a means to achieve SDGs (Figure 5).

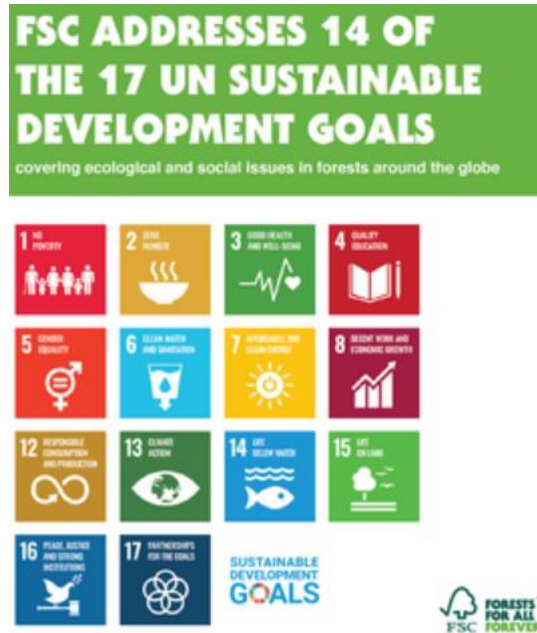


Figure 5: The role of FSC to achieving SDGs³⁰

According to the FSC strategy (2021-2026)³¹, as a community for co-creation (Figure 6), it brings together diverse stakeholders from economic, environmental and social perspectives (i.e., three pillars of SD) in a balanced organizational structure to define standards for forest stewardship. The standards are expressed in Principles and Criteria, from which forest solutions are derived attracting markets and diverse organizations and actors to adopt them. FC, based on policies and standards and the verification and integrity mechanisms created, has been the leading solution derived from the Principles and Criteria. It enables market recognition of the value and benefits encapsulated in wood from responsible forestry. Recently, FSC has added other dimensions by enabling claims for the provision of ecosystem services.

²⁸ Nussbaum and Simula, 2005. The Forest Certification Handbook 2nd Edition, Earthscan, London - Sterling, VA

²⁹ FSC, 2019. FSC: A tool to implement the sustainable development goals

³⁰ FSC, 2019. FSC: A tool to implement the sustainable development goals

³¹ FSC, 2021. Forest Stewardship Council Global Strategy 2021–2026: Demonstrating the value and benefits of forest stewardship

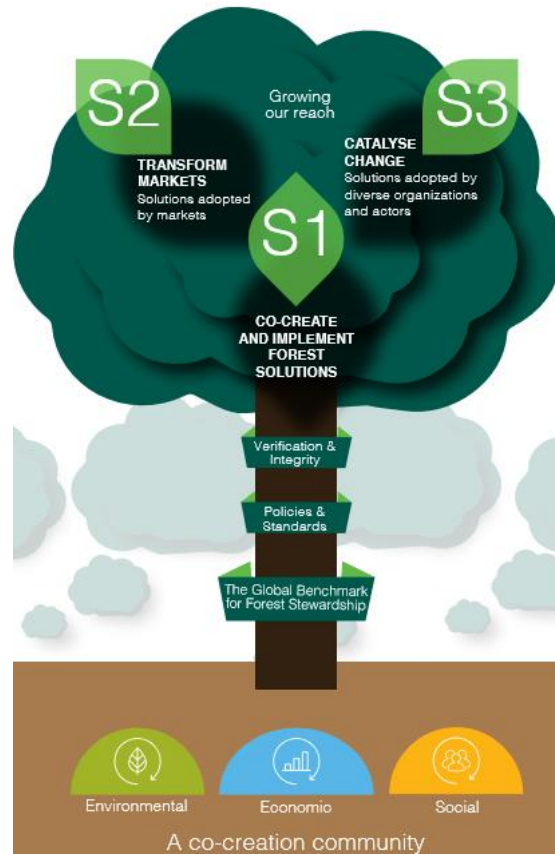


Figure 6: The true value of forests is recognized and fully incorporated into society worldwide³²

Implementing charcoal certification in Tanzania, including that of CBFM, is a way to improve the environmental, economic and social outcomes of the charcoal trade³³, ³⁴ through FC standards³⁵. The FC, as a tool for ‘*Responsible Forest Management and Sustainable Forest Product Supply Chains*’ contribute efficiently to managing the range of multiple products and services to maintain or enhance long term economic viability and the range of environmental and social benefits³⁶, e.g., complying with relevant legislation, biomass recovery, in miombo woodlands³⁷ for the case of Tanzania. Charcoal certification could positively transform the sector and shift it towards formal and regulated charcoal trade for the benefits of both people and nature.

2. Objectives and Background to the study

2.1. Background

This study builds on the conclusions and recommendations of the 2020 CoForEST study on charcoal certification³⁸. The study recommended that the FSC - NFSS be complemented with

³² FSC, 2021. Forest Stewardship Council® Global Strategy 2021–2026: Demonstrating the value and benefits of forest stewardship

³³ Malimbwi, R.E. and Zahabu, E. 2008. Analysis of sustainable charcoal production systems in Tanzania. In S. Rose, E. Remedio & M.A. Trossero, eds. Criteria and indicators for sustainable woodfuels: case studies from Brazil, Guyana, Nepal, Philippines and Tanzania.

³⁴ Kyriakopoulos et al, 2015. Environmental Viewpoint of Fuelwood Management, Proceedings of the 7th International Conference on Information Communication and Technologies in Agriculture, Food and Environment (HAICTA, 2015), Kavala, Greece.

³⁵ Sutherland, et al 2021. What Works in Conservation. Cambridge, UK: Open Book Publishers

³⁶ Kalonga, K; Midtgaard, F and Klanderud, K. 2016. Forest certification as a policy option in conserving biodiversity: Empirical study of forest management in Tanzania. Forest Ecology and Management 361:1-12

³⁷ Chidumayo, E.N. and Gumbo, D., 2012. The environmental impacts of charcoal production in tropical ecosystems of the world: A synthesis. Energy for Sustainable Development

³⁸ <http://www.tfcg.org/wp-content/uploads/2021/02/TFCG-Technical-Paper-46Charcoal-Certification-in-Tanzania-2020-FINAL.pdf>

TBS compulsory standards and that TBS develop specific standards for charcoal kilns, to include charcoal production process and quality. This study also builds on previous research by the CoForEST project and on work by the Mpingo Conservation and Development Initiative (MCDI), Forest and Beekeeping Division (FBD), TBS, World Wide Fund for Nature (WWF) and other non-governmental organizations (NGOs) and private sector companies relating to the NFSS and TBS standards. The study noted that the TBS Wood Charcoal and Briquettes Standards TZS1312:2010 were under review.

The FSC, through standards development group (SDG) at national level is responsible for developing NFSS that accommodate local contexts and perspectives without compromising the requirements of the principles and criteria of FSC international standards³⁹. The NFSS for Tanzania was approved by FSC International - Policy and Standards Unit in 2018⁴⁰.

The TBS, according to the Standards Act No. 2 of 2009 is mandated to deliver quality products that include standards and quality assurance services by meeting and even exceeding customers' requirements⁴¹. The standard is a set of technical definitions and guidelines, 'how to' instructions for designers, manufacturers, and users, aiming at promoting safety, reliability, productivity and efficiency in almost every industry. A Tanzania Standard is a document approved by the TBS Board of Directors that provides, for common and repeated use, rules, guidelines or characteristics for products and services and related processes or production methods, aimed at the achievement of the optimum degree of order in a given context. It may also include or deal exclusively with packaging, marking or labelling requirements, among others (e.g., terminology, symbols) as they apply to a product, process or production method. TBS standards, in this perspective, help to make sure that products and services are fit for their purpose and are comparable and compatible.

2.2. Objectives

The main objective of this study is generating knowledge to inform the implementation of charcoal certification in CBFM areas in Tanzania. The analytical objective of this study is to assess the implementation of charcoal certification on the ground. Specifically, this study addresses four objectives:

- I. To assess the feasibility of linking FSC - NFSS with TBS compulsory standards with a detailed focus on the charcoal value chain (institutions, processes).
- II. To investigate and present options for a TBS standard on charcoal kilns, production, quality and species for sustainable charcoal production.
- III. To assess the feasibility and profitability of applying of TBS Standard TZS 1312:2010⁴² to sustainable charcoal produced in the CoForEST project area.
- IV. To recommend measures that could be taken by the CoForEST project partners and other stakeholders to promote progress on charcoal certification to support socially inclusive and ecologically sustainable charcoal value chains.

³⁹ FSC, 2020. Guidance for Standard Development Groups: Developing National High Conservation Value Frameworks (FSC-GUI-60-009 V1-0)

⁴⁰ <https://fsc.org/en/newsfeed/tanzania-launches-fsc-national-forest-stewardship-standard>

⁴¹ The Tanzania Bureau of Standards: Handbook, 2019

⁴² Specifications for wood charcoal and charcoal briquette as fuels for household use

3. Methods and Results

3.1. Methods

Primary and secondary data and information were gathered through relevant documents review and fieldwork. Tools/techniques that were used for stakeholders' consultation included interviews (face to face - f2f, telephone, emails, Momentive), key informants and focus group discussions (FGDs). Data and information such as internal/external forces that impact charcoal production and market in the context of certification were gathered. They were analysed using qualitative and quantitative methods, including PESTEL⁴³ -SWOC⁴⁴ analyses. The PESTEL analysis, among others, helps an organisation to identify the external forces that could impact their market and analyse how they could directly impact their business⁴⁵. It's important when undertaking such an analysis that the factors affecting the organisation are not just identified but are also assessed - for example, what impact might they have on the organisation.

Both stakeholders' consultation and fieldwork were undertaken with a primary emphasis on understanding the qualitative aspects of implementation of charcoal certification rather than pursuing statistically representative sampling⁴⁶. The study was carried out in Kilosa, Morogoro and Mvomero districts (Figure 7). However, for logistical purposes, one district (Kilosa) was sampled for on ground field survey and stakeholders consultations. In the other districts (Morogoro and Mvomero), only stakeholders' consultations were undertaken. In Kilosa district, three villages (Ulaya Mbuyuni, Chabima and Kitunduweta) with history of SCP for five or more years were purposively sampled, whereby randomly sampling was used to recruit key respondents (e.g., charcoal producer groups) who were involved in in-depth interviews and FGDs.

The selection of respondents based on their previous or current participation in charcoal production and/or forest resource management, economic planning, community development, environment and local governance. The sample also included respondents from organisations and institutions who are directly or indirectly involved in charcoal production and trade (e.g., District Forest Officer/District Forest Manager - DFO/DFM, Tanzania Forest Services/Forest and Beekeeping Division - TFS/FBD, Regional Secretariat).

The consultation process also included relevant government ministries, departments and agencies - MDAs (TBS, Small Industries Development Organisation - SIDO, Ministry of Natural Resources and Tourism - MNRT:TFS/FBD, President's Office, Regional Administration and Local Government - PO-RALG, Tanzania Industrial Research and Development Organization - TIRDO, Sokoine University of Agriculture - SUA, Vice President's Office, Division of Environment: VPO-DoE), private sector (e.g., TBS TZS1312:2010 subscribers, FSC certificate holders, etc) and NGOs/Civil Society Organisations - CSOs (MCDI, WWF) and other key stakeholders interested and/or affected with implementation of charcoal certification (e.g., Africa Forest Forum - AFF, FSC Africa). A checklist of questions was developed and used for information and data collection, and key issues discussed are summarised and presented in Annex 1.

⁴³ Political, Economic, Social, Technological, Environmental and Legal

⁴⁴ Strengths, weaknesses, opportunities and challenges

⁴⁵ <https://blog.oxfordcollegeofmarketing.com/2016/06/30/pestel-analysis/>

⁴⁶ Kothari, C. R. (2008). Research Methodology, Methods and Techniques (Second ed.). New Delhi: New Age International (P) Limited

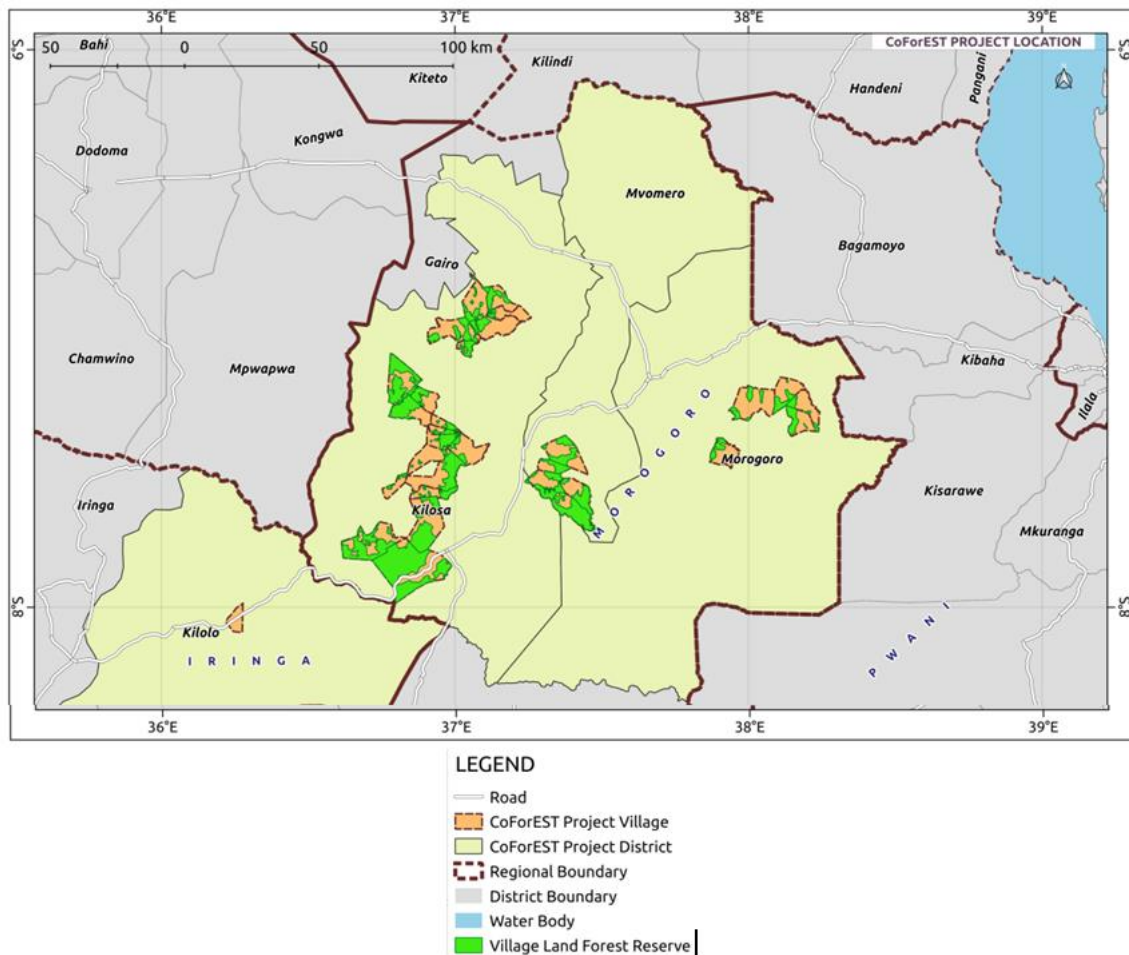


Figure 7: Project map showing selected sites (Kilosa, Morogoro and Mvomero districts) for the study

The deployment of several approaches allowed collection of qualitative and quantitative data, but also for the purposes of triangulation⁴⁷ of findings about feasibility and profitability of the implementation of charcoal certification in the context of FSC certification and TBS standards. The systematic document review was synchronized and hence collated all information and data to respond to the study objectives through the use of PESTEL-SWOC analyses, followed up with A'WOT quantitative analysis.

The A'WOT approach is a combination of Analytic Hierarchy Process (AHP) and SWOC analysis to quantify the SWOC groups and factors by weighting them^{48, 49, 50, 51}. The A'WOT approach uses experts' experience and knowledge, and proceeds as follows: 1) SWOC analysis is carried out - the relevant factors of the external and internal environment are identified and included in the SWOC analysis; 2) The mutual importance of the SWOC factors are determined separately within each SWOC group - the importance of the SWOC factors is defined as follows: 100 points are allocated for SWOC factors according to their importance separately in each SWOC group; 3) The mutual importance of the SWOC groups are determined - 100 points are allocated to the four SWOC groups. Finally the individual SWOC

⁴⁷ Mwanje, J. (2001). Issues in Social Science Research: Social Science Research Methodology Series Module 1. Addis Ababa: OSSREA

⁴⁸ Kurttila, et al. 2000. Utilizing the analytic hierarchy process (AHP) in SWOT analysis - a hybrid method and its application to a forest-certification case. Forest Policy and Economics 1(1): 41-52

⁴⁹ Kajanus, et al. 2012. Making use of MCDS methods in SWOT analysis, Lessons learnt in strategic natural resources management. Forest Policy and Economics 20 (C): 1-9.

⁵⁰ Kalonga et al. 2019. Status of forest certification in eastern and southern Africa sub-regions. African Journal of Rural Development, Vol. 4 (1):109-123

⁵¹ Genta, et al. 2019. Sustainable Strategy of Charcoal (Panglong Arang) Management in the Bengkalis Regency. J Environ Anal Toxicol 9: 602.

factors within each SWOC group are weighted and scaled according to these priority values. The weightings' scale range from 0.00-1.00, whereby 0.00 is lowest score and 1.00 is highest score.

3.2. Results

Data and information gathered through literature review and stakeholders' consultation were analysed descriptively to respond to the study's objectives. Specifically, the PESTEL-SWOC analyses informed the understanding of the feasibility and profitability of charcoal certification, including risks and aspects such as socio-economic, institutional, legal, environment and governance. The outcomes of the PESTEL-SWOC analyses were used to assess the SWOC factors in a SWOC analysis, and quantifying the same using A'WOT approach (see Section 3.1) to understand the status quo of charcoal certification implementation in Tanzania.

This section covers results of each of the four objectives, providing detailed description and discussion on how the results address the objectives.

3.2.1. The feasibility of linking FSC National Forest Stewardship Standards with TBS compulsory standards with a detailed focus on the charcoal value chain (institutions, processes).

Through stakeholders' consultation process and relevant documents review, the study assessed the feasibility of this linkage between FSC-NFSS and TBS compulsory standards, with a detailed focus on the charcoal value chain, reflecting on institutions, processes.

The FC is one type of many voluntary environmental standards that use market processes to provide incentives for private firms, as well as some public land management agencies, to adopt environmentally and socially sustainable business practices⁵². The standards may not be able to fully replace regulation, taxation or incentives to provide environmental protection, and they are most likely to be adopted when the threat of some other instruments is substantial⁵³. To be successful, standards must have sufficient rules to protect the environment, correct social problems and contribute to the economy. They must promote sustainability to the public (external) and improve sustainability within a forest manager/owner (internal). The standards must provide a balance between credible, rigorous process and rules that improve practices, yet be possible to implement well and be affordable⁵⁴.

The FC is one of the best-known standards designed to demonstrate corporate social responsibility (CSR), and has been termed a non-state market-driven governance mechanism⁵⁵, indicating its market-based orientation, rather than government intervention. Lister, 2011⁵⁶ extends this view, terming FC as co-governance, noting that while the private sector serves as the programme administration body, governments are also involved in educating and promoting certification, actually being certified, or requiring use of certified forest products. Notably, while FC is typically not a state system, and does rely on forest product markets, the state is involved in many elements, ranging from helping formulate certification systems or at least standards, and enacting the environmental and social laws

⁵² Vogel, D. 2007. Private global business regulation. *Annual Review of Political Science* 11:261–282.

⁵³ Coria, J. and Sterner, T.. 2011. Natural resource management: challenges and policy options. *Annual Review of Resource Economics* 3:203–230

⁵⁴ Cabbage, etal. 2017. *Natural Resource Policy*. Long Grove, IL: Waveland Press

⁵⁵ Cashore, etal. 2004. *Governing Through Markets: Forest Certification and the Emergence of Non-State Authority*. New Haven, CT: Yale University Press

⁵⁶ Lister, J. 2011. *Corporate Social Responsibility and the State: International Approaches to Forest Co-regulation*. Vancouver, BC: UBC Press

that must be followed in certified forests, to issuing government mandates that require use of certified forest products. Certification can also influence state systems, e.g. governments may incorporate elements of certification into forestry regulation⁵⁷.

What matters for those seeking sustainable management of forests is which system has the biggest impact on trade in forest products and services, while providing a guarantee that the guidelines for sustainable management of forests and their services have been followed⁵⁸. For this, a certification system needs to be accepted by forest owners/managers and producers, as well as members of society who are concerned about sustainable forest management, with wholesale, retail and end-user markets willing to pay for the certified goods (Figure 8).

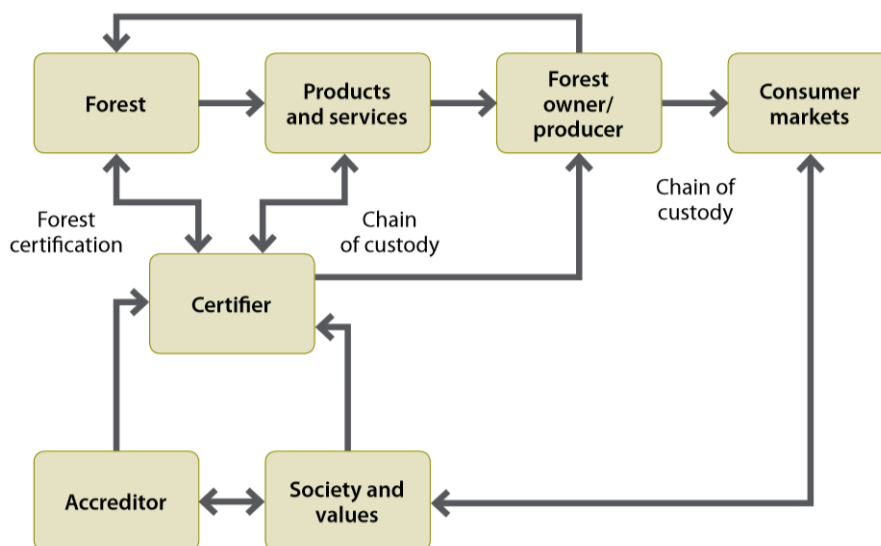


Figure 8: Components - Implementation of certification⁵⁹

The three most important market benefits of FC are potential market access, improved public image and price premiums⁶⁰. Governments strongly influence the components in this Figure 8. As certification is a private sector, market-based tool it is important to assess the role of markets in the certification of forest produce in collaboration with the government.

It has been argued that FC is leading to the privatisation of forest governance, which traditionally has been in the hands of centralised state governments^{61,62}. For the successful FC, it will be important to know where along the spectrum from centralised state governance to localised private governance the various forest produce will be managed along the value chain⁶³. The role of privatised vs state governance will likely also be determined by the scale of projects, with more extensive projects at landscape level requiring determination and enforcement of land tenure and management rights by the state. Such systems would go against the voluntary nature of certification standards, necessitating standards to be compulsory, and hence the need for establishing the linkages between FSC standards and TBS compulsory standards.

⁵⁷ Cabbage et al. 2020. Forest Certification and Forest Use A Comprehensive Analysis.

In The Wicked Problem of Forest Policy: A Multidisciplinary Approach to Sustainability in Forest Landscapes.

⁵⁸ Meijaard, et al. 2011 Ecosystem services certification: opportunities and constraints. Occasional Paper 66. CIFOR, Bogor, Indonesia.

⁵⁹ Meijaard, et al. 2011 Ecosystem services certification: opportunities and constraints. Occasional Paper 66. CIFOR, Bogor, Indonesia.

⁶⁰ Kalonga, et al. 2015. Equity in Distribution of Proceeds from Forest Products from Certified Community-Based Forest Management in Kilwa District, Tanzania. Small-scale Forestry 14:73–89

⁶¹ Agrawal, et al. 2008 Changing governance of the world's forests. Science 320: 1460-1462

⁶² Guéneau, S. and Tozzi, P. 2008 Towards the privatization of global forest governance? International Forestry Review 10: 550-562

⁶³ Meijaard, et al. 2011 Ecosystem services certification: opportunities and constraints. Occasional Paper 66. CIFOR, Bogor, Indonesia

The FSC - NFSS⁶⁴ covers Forest Management (FM) and Chain of Custody (CoC) for Tanzanian Natural and Plantation Forests and Small and Low-intensity Managed Forests (SLIMF). The standards signify environmental issues that determine the environmental perspective of an emerging and contemporary charcoal market that demands certified charcoal.

The general goal of the FSC standards is to achieve ‘environmentally appropriate’, ‘socially beneficial’, and ‘economically viable’ forest sector⁶⁵. In addition to providing incentives to companies to incorporate the social costs of forest produce production, the FSC certification criteria emphasize compliance with law and international agreements; tenure security and conflict resolution among stakeholders; recognition of local communities’ land rights; community relations and workers’ rights; investments to maintain biodiversity; the ecological productivity of the area; minimized waste and damage to other resources like soil and water due to road construction; enhanced forest regeneration, monitoring and assessments of impacts of activities; and maintenance of high conservation value forests⁶⁶ (Figure 9).

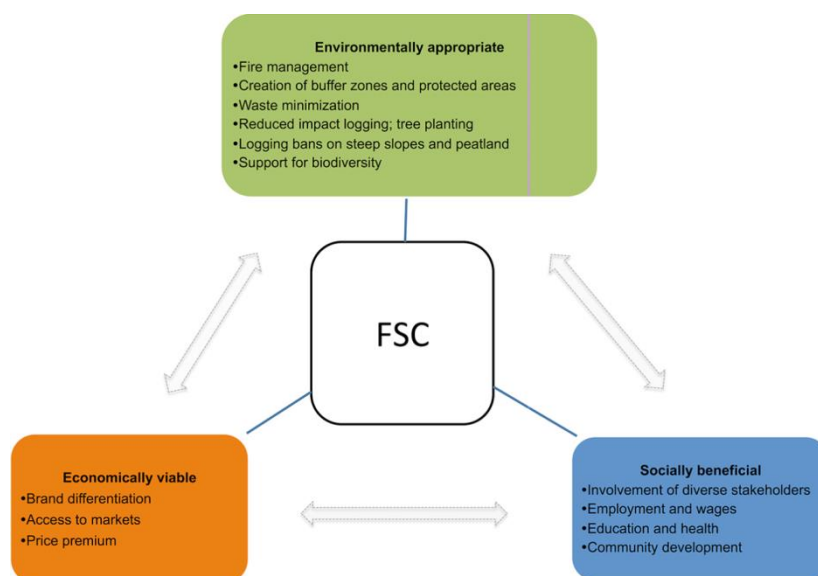


Figure 9: FSC impacts – The arrows indicate linkages between the three pillars of sustainable development⁶⁷

The voluntary nature of FSC standards is a challenge, posing low uptake and implementation of certification standards on the ground^{68, 69}. Scholars (see e.g.^{45, 55, 70, 71}) recommend making these voluntary standards (non-state actors instruments), compulsory or legal at national and regional level as a possible solution for the long-run effective forest governance (Figure 10). This will enhance high adoption and ensure implementation on the ground for sustainable

⁶⁴ <https://fsc.org/en/newsfeed/tanzania-launches-fsc-national-forest-stewardship-standard>

⁶⁵ FSC, 2015. FSC Principles and Criteria for Forest Stewardship

⁶⁶ FSC, 2021. Forest Stewardship Council® Global Strategy 2021–2026: Demonstrating the value and benefits of forest stewardship

⁶⁷ Miteva, et al. 2015. Social and Environmental Impacts of Forest Management Certification in Indonesia. *PLoS ONE* 10(7): e0129675

⁶⁸ Kalonga et al. 2019. Status of forest certification in eastern and southern Africa sub-regions. *African Journal of Rural Development*, Vol. 4 (1):109-123

⁶⁹ Purbawiyatna, A. and Simula, M. 2008 Developing forest certification. Towards increasing the comparability and acceptance of forest certification systems. ITTO Technical Series No 29: 1-128. International Tropical Timber Organization, Yokohama, Japan.

⁷⁰ Agrawal et al. 2008. Changing Governance of the World's Forests. *Science* 320: 1460

⁷¹ Pambudi, A.S. 2021. A reflection on the management of natural resources and the environment in Indonesia. *Academia Letters*, Article1789

forest resources management⁷², because they will serve as a tool for managing changes in forest governance and their social, economic, and political drivers.

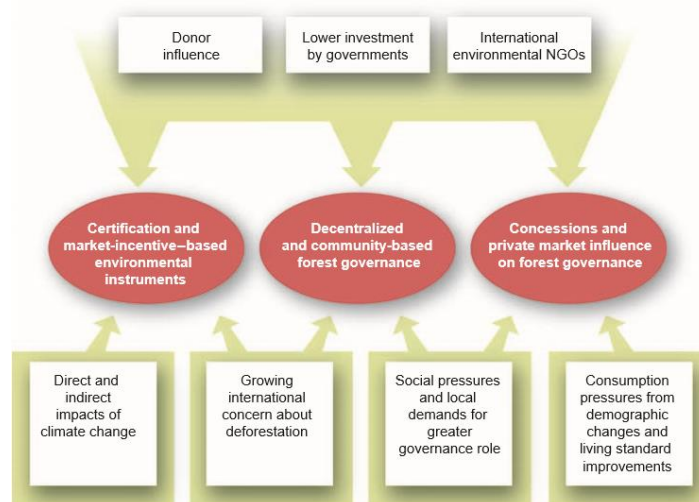


Figure 10: Changes in forest governance and their social, economic, and political drivers

Decentralization, concession, and certification related trends in forest governance are the result of important social, economic, and political drivers (see Figure 10). Forest governance for SFM requires an FC system for the country to transition from a traditional forest management system to sustainable forestry (see e.g.,⁷³). The change from voluntary to compulsory status will provide an opportunity for the strict enforcement of the implementation of a national forest certification system to steer the forestry sector into a formal sector, i.e., sustainable path⁷⁴.

The TBS being mandated to develop standards has an established national standardization system through which standards are formulated. This system is based on the ‘consensus principle’ which works through the use of technical committees. The latter are supervisory committees commonly known as Divisional Standards Committees. These committees draw members from all stakeholder groups including industries, government MDAs, academic/research institutions, business organizations and consumers. The standards cover various sectors of the economy including food and agriculture, chemicals and medical devices, textiles and leather, electro-technical, mechanical and metallurgy engineering, civil engineering and construction, environment, mining and minerals and general standards. The standards formulated are voluntary, however; if a standard covers a product that can affect health, safety, the environment or can have significant impact to the national economy, such standard is published as a compulsory standard.

During the time of this study, the process for the NFSS adoption was initiated by submitting a formal application form (Annex 2a) to the TBS - Forestry/environment standards development ‘Technical Committee’ and proposed the FSC - NFSS be adopted and declared as compulsory standard for guidance in decision making, i.e., enforcement during implementation of certification standards. The application was accepted and TBS listed NFSS to be adopted in 2021/2022 as a government standard for application in forest management in Tanzania.

⁷² Faure, etal, 2019. Communities at the heart of forest management: How can the law make a difference? Sharing lessons from Nepal, the Philippines and Tanzania, Client Earth/IIED.

⁷³ Tolentino etal, 2021. Awareness and Knowledge on Forest Certification in the Philippines: Foresters’ Perspectives, Philippine Journal of Science 150 (3): 1029-1039

⁷⁴ Tolentino etal, 2021. Awareness and Knowledge on Forest Certification in the Philippines: Foresters’ Perspectives, Philippine Journal of Science 150 (3): 1029-1039

During the development process, the NFSS will be linked to other TBS standards such as e.g., Wood Charcoal and briquettes standard TZS1312:2010 and Biomass Cook stoves standard TZS473:2019.

It should be noted that the gazetted NFSS might remain voluntary in nature as per TBS, but when government documents such as regulations, strategies, guidelines, etc refer to this gazetted standard, they make it mandatory during the implementation of that particular regulation, strategy and guideline. It was observed during this study that the charcoal strategy is under development by the MNRT. It is emphasized that the strategy should consider accommodating the NFSS and other TBS environment management certification standards in it for its effective execution.

The TBS provides certification of management systems based on the requirements of international standards to public and private companies, manufacturers and other service providers. The TBS Management systems certification building on International Organization for Standardization (ISO) develops international standards reflecting local contexts. The Management Systems Certification offers the following benefits: a) Ability to maintain consistency; b) Increase in customer's confidence; c) Enhance customer's satisfaction; d) Identify and address the risks and opportunities associated with organization; e) Ability to demonstrate conformity to the specified product or service requirements; f) Increase in productivity, efficiency and reduction of wastes; g) Compliance with necessary statutory and regulatory requirements; h) Increase in competitive advantage; i) Improved top management's commitment and decision-making; j) Improved working conditions and motivation for employees; k) Improved image and reputation of the organization; and l) Continual improvement. These systems certification include: a) ISO 9001:2015 (Quality Management Systems); b) HACCP (Hazard Analysis and Critical Control Points); c) ISO 14001:2015 (Environmental Management Systems); and d) ISO 45001:2018 (Occupational Health and Safety Management Systems).

There is no standard for wood-based products in Tanzania under ISO. A formal application form (Annex 2b) was submitted to the TBS - Forestry/environment standards development 'Technical Committee' and proposed the development of this standard with reference to ISO 38200:2018. Linkage was created with focus on 'management systems certification', specifically, for the charcoal value chain TBS standard development. The standard ISO 38200:2018 - Chain of custody of wood and wood-based products standard for Tanzania that is under development, to accommodate not only charcoal in the standard, but also establish complementarity with FSC-NFSS: FM/CoC standards. These linkages would enhance the adoption and implementation of the NFSS on the ground for sustainability practices, specifically, enhancing sustainable solid biomass production for charcoal value chain. The time when the NFSS will be approved and Gazetted by TBS, the standard will have number/standard quality mark. Such act, depending on the application of the standard in government documents, might make the NFSS have legal recognition in Tanzania. There are quite few countries in Eastern and Southern Africa which have made FSC standards legal in their countries - these include Uganda, Namibia and South Africa⁷⁵.

The final stage in the standard development process, after the Gazettment, is publication. The MNRT/FBD and TBS in collaboration with partners (e.g., TFCG, MCDI, WWF, FSC Africa, Certificate Holders - CHs in Tanzania) will make use of this opportunity, i.e., the publication

⁷⁵ AFF, 2019. The State of Forestry in Africa: Opportunities and Challenges. African Forest Forum, Nairobi Kenya. 186 pp.

stage, to have national launch and disseminate the NFSS for implementation at national level. Thereafter, other government MDAs can refer to it in their policy and legal frameworks, including legislations, regulations, etc.

To have an understanding of the '*status quo*' of the implementation of certification in Tanzania's context, a brief analysis of the policy and legal framework related to forest resources management is here presented. The analysis provides an overview of the status of the policy implementation and interventions employed in the adoption of certification standards in Tanzania.

The MNRT strategic plan (2021-2026)⁷⁶ identifies a number of critical issues to be dealt with during its implementation. Over dependence on woodfuel (charcoal and firewood) as a source of energy is one of these critical issues. An objective to address this issue is 'enhancing conservation, management and sustainable utilization of natural forests'. Limited engagement of both state and non-state actors to promote Sustainable Forest Management (SFM) practices, e.g., certification and standards has led to low adherence to sustainability practices due to lack of third party checks and balances (independent third party audits). The MNRT forest policy implementation strategy (2021-2031)⁷⁷, recognizes forest certification as a tool for achieving SFM practices, and henceforth, it does set a target that 'wood and non-wood product (including charcoal) quality assurance and certification standards are developed and implemented by June, 2022'. Moreover, the forest policy (1998) recognizes community-managed forests in Policy statement (6): Village land forest reserves will be managed by village government or any other entities designated by the village government. The forests will be managed based on sustainable management objectives defined in management plans for each forest.

The MNRT Strategic Plan and forest policy implementation strategy acknowledge certification and standards. To ensure that all the charcoal produced comply with TBS standards, there is a need of making sure that the Charcoal strategy emphasizes the use of such certification and standards for sustainability of the resources and the health of producers and consumers. This will ensure that all charcoal produced subscribe to FSC certification and TBS standard, i.e., all charcoal bags would need to comply with FSC certification and TBS standards, in order to be traded domestically and internationally.

Therefore, this study, among other things of relevance at national, regional and global level is an implementation of the MNRT Strategic plan and Forest policy implementation plan.

3.2.2. Options for a TBS standard on charcoal kilns, production, quality and species for sustainable charcoal production.

Through literature review, stakeholders' consultation process and fieldwork in the selected sites, the study investigated the options for a TBS standard on charcoal kilns, production, quality and species for SCP.

Charcoal is produced using a number of methods that involve heating wood in airtight ovens or retorts, in chambers with various gases, or in kilns supplied with limited and controlled amounts of air⁷⁸. High-temperature heating by all methods breaks down the wood into gases,

⁷⁶ URT, 2021a. Ministry of Natural Resources and Tourism Strategic Plan: 2021- 2025

⁷⁷ URT, 2021b. Ministry of Natural Resources and Tourism - National Forest Policy Implementation Strategy: 2021 - 2031

⁷⁸ Forest Products Laboratory, 1961. Charcoal Production, Marketing, and Use, Report No. 2213

a watery tar mixture, and the familiar solid carbon material commonly known as charcoal⁷⁹. The World Bank 2010⁸⁰ reported that the conversion of wood to charcoal plays a small but crucial role in the charcoal value chain. Charcoal is produced following several processes, artisanal and industrial (Figure 11), but without coherent policies and regulations, the charcoal value chain remains informal and unregulated leading to inefficient and risky production methods⁸¹, compromising the environment, quality and health of producers and consumers.





Characteristics	Traditional Kilns (a)	Improved Kilns (b)	Semi-industrial Kilns (c)	Industrial Kilns (d)
Conversion Technology				
Efficiency	8-12%	12-18%	18-24%	25-33%
Production of 1 kg of charcoal from	8- 12 kg wood	6 – 8 kg wood	5 – 7 kg wood	3 – 4 Kg wood

Figure 11: Efficiencies of various types of kilns^{82, 83, 84}

According to Mugo and Ong, 2006⁸⁵, the best known industrial charcoal production processes are slow pyrolysis and supra-carbonization. During combustion, the wood undergoes 2 to 3 different chemical reactions: 2 for pyrolysis with endothermic and exothermic; the 3rd is supra-carbonization, that is, endothermic again. As a result of this process, charcoal gains higher fixed carbon content (> 82%). **Parameters such as the humidity of the wood used, kiln size, and process control, play an important role in the process.** Charcoal production in Tanzania, like other countries in Africa, over the years, has been using traditional methods with low efficiency. In most instances, charcoal production takes place using traditional earth mound or pit kilns. This is a highly inefficient process with low conversion efficiency. High efficiency in the process can be gained from improved technology.

The GIZ⁸⁶ HERA Cooking Energy Compendium provides a detailed analysis of charcoal production methods and processes.

Traditional Kilns:

a) Earth Pit Kiln

Earth pit kiln represents the simplest technology for charcoal production, and it is the traditional way of making charcoal in Tanzania. The process of using an earth pit kiln begins by stacking wood in a pit, sealing it with a layer of grass and soil and starting carbonization by igniting the wood at one end. The earth pit kiln is labor intensive since a pit must be dug into the ground. Ventilation may also be difficult to control and often carbonization is incomplete, producing only low quality charcoal.

b) Earth Mound Kiln

⁷⁹ Kajina et al, 2019. Charcoal production processes: an overview, Journal of Sustainable Energy & Environment 10:19-25

⁸⁰ WB, 2010. Environmental crisis or sustainable development opportunity? Transforming the charcoal sector in Tanzania

⁸¹ Mugo, F. and Ong, C. 2006. Lessons of eastern Africa's unsustainable charcoal business.

⁸² FAO, 1985. Industrial charcoal making

⁸³ GIZ, 2011. Charcoal Production (https://energypedia.info/wiki/Charcoal_Production)

⁸⁴ WB, 2010. Environmental crisis or sustainable development opportunity? Transforming the charcoal sector in Tanzania

⁸⁵ Mugo, F. and Ong, C. 2006. Lessons of eastern Africa's unsustainable charcoal business.

⁸⁶ GIZ, 2011. Charcoal Production (https://energypedia.info/wiki/Charcoal_Production)

This is also a common kiln used for charcoal production (see Figure 11a). It can be constructed from locally available material. The wood is collected and stacked in the polygonal shape of kiln. The wood is then covered with a layer of grass and the construction is sealed with soil. A small opening allows the control and monitoring of the process. When the kiln has been lit, it requires continuous attention for 3-15 days depending on the size. After the kiln has cooled down charcoal can be harvested. The main advantage of this type of kiln is that it can be constructed easily without cost at the harvest site. Disadvantages are that carbonization takes rather long and the process requires continuous attention. In addition, charcoal quality is rather low.

Therefore, charcoal production using traditional kilns is associated with high consumption of wood. Generally, earth mound kilns are typically more efficient than earth pit kilns.

Improved Kilns:

a) Earth Mound Kiln with Chimney

This is also known as Casamance Kiln. It is an improved earth mound kiln equipped with a chimney (see Figure 11b). The chimney, which can be made of oil drums, allows a better control of air flow. In addition, the hot flues do not escape completely but are partly redirected into the kiln, which enhances pyrolysis. Due to this reverse draft carbonization is faster than traditional earth kilns and more uniform, giving a higher quality of charcoal and efficiency. The improved earth mound kiln has shorter carbonization times due to the enhanced hot flue circulation. Disadvantages of this kiln type are that it requires some capital investment for the chimney and it is more difficult to construct than traditional earth kilns.

b) Brick Kiln

Contrary to the earth mound or traditional kilns, the brick kiln is stationary (see Figure 11c). It is suitable for semi-industrial production of charcoal. The most notable type is the half orange Kiln. It is made entirely out of brick and mud as mortar. Loading and unloading is performed through two opposite doors, which are sealed before the kiln is ignited. The carbonisation cycle is much quicker and allows harvesting of charcoal after 13-14 days. Since brick kiln is stationary, it can only be used in areas with an easy supply of wood. Moreover, the wood has to be cut with some precision and water supply is required for preparation of mortar, and the construction is very intensive and costly.

c) Steel Kiln

Many different types of steel kilns have been developed which are considered as one basis of modern charcoal production (Figure 12).



Figure 12: Steel Kiln

They are capable to carbonize even poor quality wood and can easily be transported when necessary. However, as the annual output of a typical demountable steel kiln is about 100 - 150 t, they are not suitable for high-volume production. Furthermore, the investment costs may be as high as \$1,000, which limits the use of steel kilns considerably. Nevertheless, since efficiency is high (27-35 %) and carbonization is quick (16-24 hours after ignition), steel kilns have been promoted as community kilns in Kenya.

Industrial Process:

a) *The supra-carbonization technology*

The innovative character of the supra-carbonization process is based on the use of vertical cylindrical metal furnaces (see Figure 11d), intended for the carbonization of wood at temperatures of around 800°C, to reach a fixed carbon content in charcoal between 82 and 84 %. The technology makes it possible to control the carbonization temperature at the heart of the furnace. The technology requires 30 % less wood than traditional methods to obtain the same amount of charcoal, and kilns make it possible to recover industrial and forest wood waste. This technology, unlike pyrolysis for example, does not need external energy input to cook the wood.

The furnace is filled with pre-cut woods chips in 10x5x5 cm, which avoids breaking the pieces of charcoal after charring, increasing productivity by +30 %. The wood is inflamed from the top and it will ignite to the bottom. The air vents located under the furnace are then closed once all the wood is on fire. A complete carbonization cycle lasts between 20 and 24 hours, depending on the moisture content of the wood. The production process does not contaminate soil or air. The fixed carbon quality obtained in this process preserves the health of consumers (colorectal cancer).

Charcoal is first of all characterized by its density which can vary between 0.2 and 0.6 t/m³ depending on the density of wood used as raw material. Charcoal produced from hardwood is heavy and strong, whereas produced from softwood is soft and light. The bulk density of charcoal does not only depend on the apparent density but also on the size distribution, and is in the range of 180-220 kg/m³. Charcoal has a relatively low moisture content of around 3-10 %. The gross calorific value of charcoal is linked to the amount of fixed carbon and depends strongly on the carbonization temperature varying from 27-33 MJ/kg. Low carbonization temperatures give a higher yield of charcoal but this charcoal is low grade, is corrosive due to its content of acidic tars, and does not burn with a clean smoke-free flame. Good commercial charcoal should have a fixed carbon content of about 75 % and a final carbonization temperature of around 500°C.

According to Kimaryo and Ngereza, 1989⁸⁷ low carbonizing temperatures give a higher yield of charcoal but lower content of fixed carbon in the charcoal (Table 1).

Table 1: Effects of Carbonization Temperature on Charcoal Yield and Composition

Carbonization Temperature	Chemical Analysis of Charcoal		Charcoal Yield based on oven-dry weight (%)
	Fixed Carbon (%)	Volatile Matter (%)	
300	68	31	42
500	86	13	33
700	92	7	30

A temperature of 450°C to 500°C gives an optimum balance between a high fixed carbon content and friability of the charcoal. Another important observation is that slow carbonization at low temperature tends to produce greater yields of charcoal than fast carbonization at high

⁸⁷ Kimaryo and Ngereza, 1989. Charcoal production in Tanzania using improved traditional earth kiln. IDRC-MR216e.

temperature. This is particularly true for earth kilns. **The carbonization process may be decisive in charcoal production systems.** Unless it is carried out as efficiently as possible, it can put the whole charcoal production operation at risk since low yields in carbonization are reflected in quality throughout the whole charcoal value chain. The deployment of TBS charcoal production kiln standards could be an option to mitigate challenges related to quality.

The quality labeling of wood products and CoC certification are important market strategies for demonstrating sustainable forest management and the legal origin of wood products⁸⁸. These labels link supply of and demand for sustainably produced wood products: they help assure consumers of the legal and sustainable source of wood products, may help command a premium price or retain market share in environmentally demanding markets, and allow consumers to exercise market demand for legal and sustainable wood products⁶⁵.

The TBS, among other key functions, works to improve the quality of products both for export and local consumption through various certification schemes by deploying agreed key principles (Figure 13)⁸⁹.



Figure 13: TBS Quality Management principles

The TBS has two operational standards related to charcoal (i.e., TZS473:2019⁹⁰ & TZS 1312:2010). These are on the demand side of the charcoal value chain. In the absence of TBS standards on charcoal kilns, production, quality and species for sustainable charcoal production, the supply-side of charcoal value chain will be unsustainable. Adaptive environmental management is the optimal means for ensuring a balance in management and use of natural resources, especially in the context of 'integrated natural resource management'⁹¹.

Adaptively, to achieve SCP, a set of specifications to guide the process for charcoal production (supply-side) in the value chain is inevitable. TBS could consider complementing these demand-side standards by developing standards for kiln specifications for charcoal production so as to attract domestic and international market, but also as a tool for governance of the

⁸⁸ Kok et al, 2014. How Sectors can contribute to Sustainable Use and Conservation of Biodiversity, CBD Technical Series No 79. PBL Netherlands Environmental Assessment Agency.

⁸⁹ TBS, 2020. Management Systems Catalogue

⁹⁰ Biomass Cook stoves – Requirements providing for qualities of the cook stoves to users

⁹¹ Allan and Stankey, 2009. Adaptive Environmental Management: A Practitioner's. Springer Science, The Netherlands and CSIRO Publishing, Collingwood, Australia

sector, contributing socio-economic benefits to local communities and nation at large, while benefiting nature.

The study investigated the current process used for charcoal production in sampled sites to identify actors' need for TBS standards. There was inadequate knowledge about TBS standards related to charcoal. It was further established that the SCP model is informative and comprehensive, but best practices for sustainable production are inadequately practiced by the charcoal producers. This inconsistency in complying with SCP process was due to limited skills among charcoal producers and village natural resources committee (VNRCs). The need for the standards for charcoal kilns, production, quality and species was acknowledged and emphasized by the charcoal producer groups, so that the standard can serve as a yard stick to measure performance. In recognition of this, it was agreed that a new standard be developed by TBS to provide for specifications for kilns, production and species for sustainable charcoal production to meet the minimum quality specification.

Stakeholders presented that an efficient kiln is the one which captures the smoke, cleans it and uses the gas for self-heating. The most suitable kiln for high volume low cost efficient carbonisation is the industrial kiln (see Figure 11d). Advantages are long life, big capacity and no corrosion. However, this is not recommended option for communities, but still TBS can develop industrial kiln and steel kiln specifications for industrial investors in favour and promotion of industrial sustainable charcoal production with national recognition, that is TBS label.

Since TFCG has piloted the improved earth mound kiln with efficiency of 15-25 % (Figure 14) and the CoForEST project is scaling up the same method, this is the recommended kiln for community charcoal producers. TBS should, in consultation with community charcoal producer groups, develop specifications for this type of kiln addressing effective carbonisation parameters so that the charcoal produced from this kiln meets the minimum quality required, e.g., fixed carbon content (>75%).



Figure 14: Charcoal production - improved earth mound kiln in Kilosa

In the process of standard development, the TBS technical committee will have to visit charcoal production sites to identify the whole procedure deployed for SCP (and gaps if any) so as to inform the committee of the specifications required for the standard. This new TBS standard (supply-side) should be declared compulsory to complement TZS473:2019 and TZS1312:2010 (demand-side), and will be linked with the CoC standard (ISO 38200:2018) that is under development.

The specifications will enable the producers to be accountable and comply with existing legislation on sustainable forest management. Additionally, it will stop perpetrators and hence

control criminal damage to the environment and illegal employment of undocumented labour. At the same time, it will give assurance and confidence to the consumers that they are consuming a product coming responsibly managed forests. A paradox still exists about the cost per kg of charcoal to repair the damage done to the environment; it is a lot more than any consumer is likely to pay...! The deployment of certification and standards, together with supportive policy and legal framework are going to be the 'Game Change'.

A TBS approved kiln would imply a manufactured product made by the formal sector that comes as a certified product. In order to protect forests and produce a quality product there has to be a move towards improved quality of charcoal through a certified production process. The adoption of improved kilns should be directly linked to sale of product from certified sources subject to a quality standard. It is important to legislate that charcoal is sold in marked bags with proof of source of approved origin and a TBS mark.

To ensure clean cooking energy from charcoal, it requires a full pyrolysis with minimum loss of wood to ash and maximum removal of volatiles. To achieve this, there is a need for kiln specifications to meet the required pyrolysis and quality. Improved kilns alone without compliance with TBS standards will not address issues of yield and profit for producers who make a lot of money selling horrified and toxic wood as charcoal - very low fixed carbon and very high emissions of toxic wood smoke. One major intervention will break the cycle, this is an organized quality certified product pre-packed with a TBS mark into the retail market at a price point that changes the current status quo.

Government's intervention on quality standards and an outright ban on un-labelled and undocumented product are going to take the industry to a new place where kiln standards and product quality standards from certified producer become the norm. The national discussion has to focus on a road map that delivers a quality product that complies with a national standard on clean cooking energy, a price point that is affordable, and a production policy that offers inclusion to communities and private sector players engaged in the sector.

3.2.3. The feasibility and profitability of applying of TBS Standard TZS 1312:2010 to sustainable charcoal produced in the CoForEST project area.

The study, through literature review, interviews, field surveys and lump charcoal sample testing, assessed the feasibility and profitability of TBS Standard TZS 1312:2010 to sustainable charcoal produced in the CoForEST project area. The TBS Standard TZS 1312:2010 provides for specifications for wood charcoal and charcoal briquettes for household use⁹². This standard (under review) aims at addressing the safety related characteristics for wood charcoal used for heating during cooking.

Sustainability management requires an integration of environmental, social and economic management and thus covers all the links between non-market and economic issues in forestry for sustainable development (Figure 15)⁹³. In addition, the issue of support for sustainability through certification can be derived from the reasons for the introduction of

⁹² TBS, 2010. TZS 1312: 2010 - Specifications for wood charcoal and charcoal briquettes for household use

⁹³ Schaltegger and Wagner. 2006. Managing and measuring the business case for sustainability. In: Managing the Business Case for Sustainability. The Integration of Social, Environmental and Economic Performance. 1st Ed. Sheffield, Greenleaf Publishing Ltd: 4.

certification (environment and social management) and particularly its economic results⁹⁴ (see Figure 15).

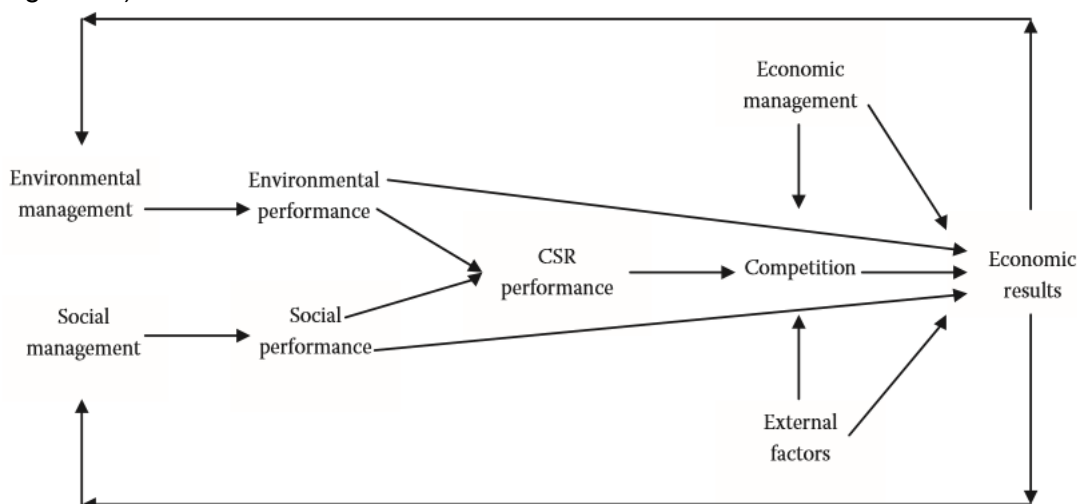


Figure 15: Relationship between Business management in accordance with the concept of sustainable development and competitiveness.

Subscribing to the TBS TZS 1312:2010 is feasible and profitable to the charcoal producer groups. It was revealed by charcoal producers that the procedures laid down for charcoal production in the project area are promoting sustainable charcoal production as per the SCP model, benefiting nature and people. To realize the economic benefits (profit) of certification, the community charcoal producer groups will have to be registered as business entities to demonstrate responsible charcoal production and hence profit from market benefits. The standard will enable them comply with the Environmental Corporate Social Responsibility Management - ECSRM (Figure 16), and enjoy benefits offered by the standard.

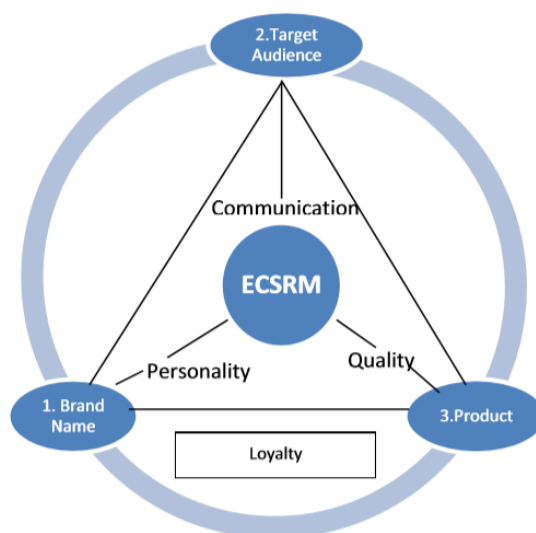


Figure 16: Relationship among Brand Name, Target Audience and Product⁹⁵

Specific details of practical examples of benefits derived from standards include e.g., SIDO support offered to registered small business entities (capacity building, products marketing via exhibition, grants); TBS benefits offered by the quality standards mark/number, such as being

⁹⁴ Frey et al, 2021. Economic Viability of CBFM for certified timber production in southern Tanzania. World development 144 (2021)105491

⁹⁵ Lim and Arumugam 2019. Environmental Corporate Social Responsibility Management and Strategy to Reshaping Consumer Behaviour. IOP Conf. Ser.: Earth Environ. Sci. 268 012122

a powerful tool for supporting innovation and increasing productivity, are a powerful marketing tool; and standards are a respected badge of quality (brand).

Lim and Arumugam, 2019⁹⁶, report that the '*Brand Name*' is needed to make or communicate the quality. The '*Target Audience*' - tapping the right target audience which place as the highest priority in the area of marketing comes after brand name because brand name play a more important role to the success for product at the initiation. The '*Product*' - the right brand name with the right target audience is essential to create the awareness on this product in the market (see Figure 16). Both SIDO and TBS benefit charcoal producer groups by creating enabling environment to them to penetrate the certified products market by harnessing and embracing the relationship among Brand Name, Target Audience and Product.

Nonetheless, stakeholders revealed that implementing TBS Standard TZS 1312:2010 to sustainable charcoal produced in the CoForEST project area is feasible but is currently challenged with inadequate market making its profitability questionable. One of the challenges reported was inadequate awareness and limited market for certified forest products compared to uncertified forest products. To ensure that certified charcoal is profitable, a strategy to reshape the market and consumer behaviour is inevitable. The strategy, as recommended by Lim and Arumugam, 2019 should include:

Government-Producer-Consumer Relationship: The Government is the first and most important level to initiate and enforce all the producers and small medium enterprises (SMEs) to comply with the policies and create awareness at society level through campaign to achieve, for instance, the Sustainable Development Goals (SDGs) in all interventions. At the government level, the strategy is to implement policy to encourage charcoal producers be organized in groups, and be formally/legally registered, and adopt certification standards. Introduce and establish designated market centres for certified charcoal. Introduce a ban on unsustainably produced charcoal, i.e., no non-certified charcoal to enter the market. Introduce a policy/procedure that requires government institutions, e.g., Academia, military, prison, etc to use certified charcoal as provided in the PPRA procedure.

Producer-Customer Relationship: At this level, producer should abstain from unsustainable charcoal production and certify their operations. Suppliers also should play their role well in increasing the awareness where they should provide more promotion to the producers by offering good price to the certified charcoal and stopping buying uncertified charcoal. In relation to '*push strategy*', government is creating necessary enabling conditions pushing the producer to produce more charcoal sustainably. This is a way to create more awareness amongst their customers. Campaign and advertisements in any digital platform that create the awareness are in fact creating the '*pull strategy*'. All these generating the pull effect where consumers are aware of the existence of certified charcoal and able to support producers by procuring their charcoal.

Charcoal is a lucrative business⁹⁷; however, as long as charcoal is not sold at a real market price, investments in improved wood-to-charcoal production/conversion are economically not attractive⁹⁸. This is the case for sustainably produced charcoal (SCP) in the study area that

⁹⁶ Lim and Arumugam 2019. Environmental Corporate Social Responsibility Management and Strategy to Reshaping Consumer Behaviour. IOP Conf. Ser.: Earth Environ. Sci. **268** 012122

⁹⁷ Oluwasola et al, 2021. Profitability of Charcoal Production and Marketing in Ibarapa Zone of Oyo State Nigeria. Asian Journal of Agricultural Extension, Economics & Sociology, 35(3): 1-7

⁹⁸ Mugo, F. and Ong, C. 2006. Lessons of eastern Africa's unsustainable charcoal business.

cannot compete in the market with unsustainably produced charcoal leaving charcoal producers with limited profit along the value chain.

While there is growing evidence about the environmental effectiveness of SCP⁹⁹ making the adoption of standards feasible; stakeholders revealed that there is little information on how SCP influences producers' opportunity to access sustainable markets and related livelihood outcomes. Lack of brand and packaging of SCP that promote the product to the market are some of the reasons for these; but also the design and implementation of choices that influence trade-offs or potential synergies between effectiveness and equity in access¹⁰⁰, i.e., agriculture-forest development nexus. To enhance community-based forest conservation while avoiding harm to the most vulnerable local communities, it is necessary to combine stringent rules (i.e., certification and standards) with widespread capacity building, greater involvement of affected actors in the value chain, and support for alternative rural development pathways.

The application of the TZS 1312:2010 to community managed forests for charcoal production in the project area will provide an opportunity for communities in the project area to explore and capitalize on the inherent merits the standard comprise of, and hence promote charcoal quality and market linkages. Annual payment to TBS for TZS 1312:2010 costs about TZS1.7mn, i.e., the costs of annual subscription and sample testing fee. Despite the challenges associated with the market accessibility for SCP, the average income for six months of the year 2021 to charcoal producer groups in Chabima village was estimated to about TZS 12,000,000¹⁰¹. This implies that the groups can make more return on their businesses if they subscribe to TBS standards and capitalize on the benefits the standard is offering. Compared to the benefits that the charcoal producers will get when certified with TBS, the charcoal producer groups indicated their willingness to subscribe to the standard and meeting the costs associated with it.

The lump charcoal sample collected was subjected to testing to identify gaps between the current product quality vs the minimum requirement of the standards (Table 2).

Table 2: TBS TZS1312:2010 - Test results vs specifications

DESCRIPTION	ON AIR DRIED BASIS (AD)				Gross Calorific Value (Kcal/Kg)
	PROXIMATE ANALYSIS (%)				
Parameters	Ash	Moisture Content	Volatile Matter	Fixed Carbon	
Standards specifications	< 5	< 10	< 20	> 75	
Sample results	5.52	2.69	63.9	28.19	6346

The results of the sample tested showed that the volatile matter and fixed carbon are not meeting the minimum requirements of the standard. The findings could be attributed to inadequate carbonization. The standard does not provide for gross caloric value specification, but the tested sample showed a high gross calorific value, which is good, but it comes from gas or smoke, not from the carbon because the fixed carbon is very low hence very dirty and unsuited for household cooking.

Additionally, the study attempted to identify number of TBS standard Certificate Holders (CHs) subscribing to these existing standards (TZS473:2019 & TZS1312:2010). At national level,

⁹⁹ TTCS 2017. What makes sustainable charcoal, sustainable? Information Note

¹⁰⁰ Grabs et al. 2021. Designing effective and equitable zero-deforestation supply chain policies, Global Environmental Change 70: 102357

¹⁰¹ CoForEST, 2021. Biannual Progress Report

one Certificate Holder only was identified subscribing to TZS1312:2010 for briquettes production (<https://www.mkaaendelevu.co.tz/about-us/>). The CH was consulted to assess the effectiveness, challenges, opportunities, weaknesses, strengths of these standards to inform options to be recommended for implementation of charcoal certification. It was revealed that the standards' specifications are very good to meet the required quality of charcoal for households' use for domestic and export market. However, it was observed that the standard has not been communicated to the public well enough, but also annual fee is expensive. The low number of CHs is mainly due to the limited awareness of the standards to the public. Some clients, in particular those who depend on local markets cannot afford the annual subscription, including testing (TZS1312:2010). The interviewed CH emphasized the need and importance of having kiln's specification standards, and reduction of annual fee.

The assessment discovered that the charcoal producer groups were aware of TBS, but not about the specific standard under discussion. The technical staff from TBS and MNRT had an opportunity to make a short presentation about the standard for awareness. Eventually, the groups were excited with the benefits the standards bring, and agreed to be TBS certified with this standard. While the development of the kiln's specifications by TBS standards is in progress, the charcoal producer groups in Kilosa which will pass the test (TZS1312:2010) should be considered for certification as pilot while building capacity to them. The application is done online via TBS website (<https://oas.tbs.go.tz/>). The groups should be affiliated to SIDO so that they enjoy facilitation (testing costs, annual subscription) from the organisation. SIDO can as well help them to be registered as business entities so that they can qualify to be supported by SIDO, e.g., capacity building on business skills, exhibition and markets. For the application, they should seek SIDO's letter of recommendation.

3.2.4. Measures to be taken by the CoForEST project partners and other stakeholders to promote progress on charcoal certification to support socially inclusive and ecologically sustainable charcoal value chains.

From the discussions of issues in the three objectives, the study through relevant document review and PESTEL-SWOC Analyses draws and recommends measures for implementation of charcoal certification. These measures will be implemented by the CoForEST project partners and other stakeholders to promote progress on charcoal certification to support socially inclusive and ecologically sustainable charcoal value chains. The SWOC qualitative analysis was followed up with A'WOT quantitative analysis. The weightings' scale ranged from 0.00-1.00, whereby 0.00 was lowest score and 1.00 was highest score.

3.2.4.1. PESTEL-SWOC Analyses

The outcomes of a PESTEL analysis (Annex 3a) was used to populate the opportunities and challenges in a SWOC analysis (Annex 3b), and quantified using A'WOT approach. Stakeholders' expertise, experience and knowledge about certification implementation in Tanzania were used to quantify the SWOC factors and groups in this approach. The SWOC analysis extracted from the PESTEL analysis summarizes the outcome of the analysis of the SWOC factors in the respective SWOC groups (Figure 17). It identifies the 'status quo' of the implementation of charcoal certification in Tanzania. The weightings of the SWOC factors (see Figure 17) by A'WOT application revealed the highest weight for a) Development Partners (DPs)'s willingness to support the development and adoption of certification and standards; b) Employment opportunities (job creation) with good working conditions; c) Global pressure on

adoption of certification/standards, including charcoal; and d) Transparency & Accountability: Engagement of all interested and affected stakeholders as *opportunities* for the implementation of charcoal certification in Tanzania. In terms of *challenges*, inadequate awareness of the public about forest certification/standards and lack of price differentiation for certified products in the market had highest weight.

The internal SWOC factors, *weaknesses* showed that insufficient awareness among resource managers/owners and consumers on forest certification/standards had highest weight. The *strengths* showed that Charcoal is a lucrative business; Presence of forest resources and the products to be certified; Existence of NGOs/CSOs, interested in SCP; and improvement on conservation had highest weight; whereas TBS charcoal standard scoring the least weight among all the SWOC factor groups, implying that it is quite unpopular to stakeholders. This necessitates the need for FSC and TBS standards awareness raising to build capacity to the public for the adoption and implementation of certification and standards.

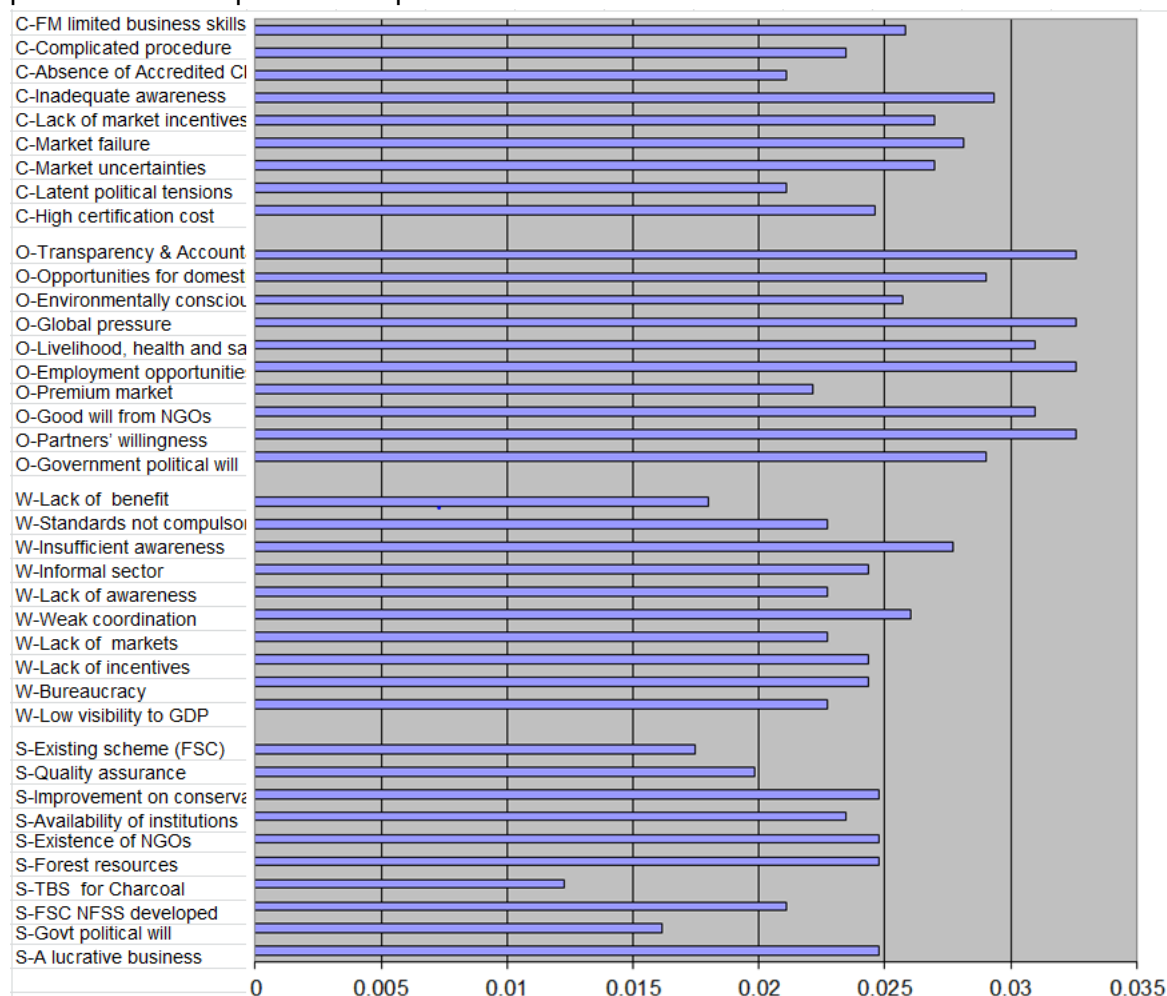


Figure 17: Graphical interpretation of the results of pairwise comparisons of SWOC groups and factors for SWOC analyses of the implementation of charcoal certification in Tanzania (NB: the higher the value means the higher weight given to the SWOC factor and vice versa)

On the other hand, the weightings of the SWOC groups summarize the relevant contribution of each group to the implementation of charcoal certification in Tanzania. It reveals that *opportunities* group has highest weight followed by *challenges*, *weaknesses* and *strengths* were the least (Figure 18). The sector can capitalize on the prevailing opportunities to mitigate the challenges, and using the current strengths to lift up the weaknesses and hence strengthen the implementation of charcoal certification on the ground in Tanzania.

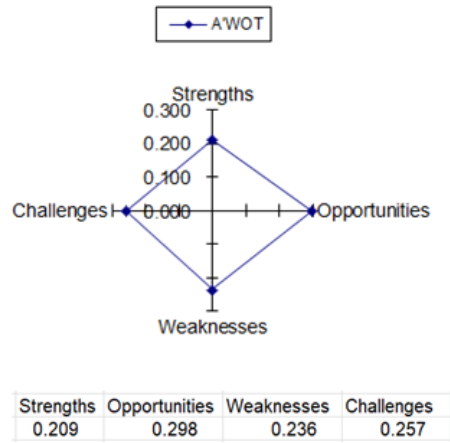


Figure 18: Relative importance of SWOC groups in an A'WOT application to SWOC analyses of implementation of charcoal certification in Tanzania

Although certification is voluntary, one of the key issues that it is strict on is compliance with existing legal framework¹⁰². Based on the PESTEL analysis (see Annex 3a) of the implementation of charcoal certification in CBFM areas in Tanzania, ten key elements (building blocks, Figure 19) as suggested by Faure et al 2019¹⁰³ should be considered in building an enabling legal framework on charcoal certification implementation.



Figure 19: Community forestry legal building blocks for certification implementation - How these thematic areas interact and inform each other

These elements discussed and presented in relation to each theme are not intended to be exhaustive but rather highlighting certain options for how to build a legal enabling environment for effective implementation of charcoal certification in Tanzania. The charcoal sub-sector is informal in Tanzania, and the charcoal producers are not organized in groups and not registered. This was confirmed by stakeholders (Figure 20).

¹⁰² FSC, 2015. FSC Principles and Criteria for Forest Stewardship

¹⁰³ Faure, et al, 2019. Communities at the heart of forest management: How can the law make a difference? Sharing lessons from Nepal, the Philippines and Tanzania, Client Earth/IIED.

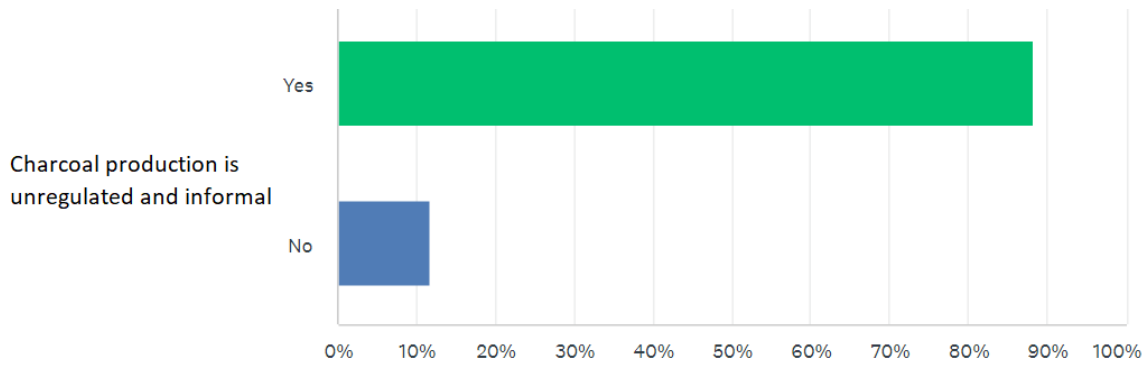


Figure 20: The informal charcoal sub-sector in Tanzania. Source: Own field data, Oct/2021

These ten building blocks (see Figure 19) will ensure, in this process, charcoal producers are organized in groups and legally registered as business entities. These building blocks provide guiding information about what legal frameworks can be considered to enable implementation of charcoal certification in CBFM areas in Tanzania.

In Tanzania, FSC certification has been promoted as a tool for maintaining or enhancing forest values (i.e. biophysical, social, economic, and policy) for about 15 years. Tapping into this experience to learn about the contribution of FC to the maintenance and improvement of a range of forest values e.g., charcoal value, is necessary. This can be established through a very transparent and participatory evaluation or 'Gap Analysis'. There are two components of evaluation (Figure 21)¹⁰⁴.

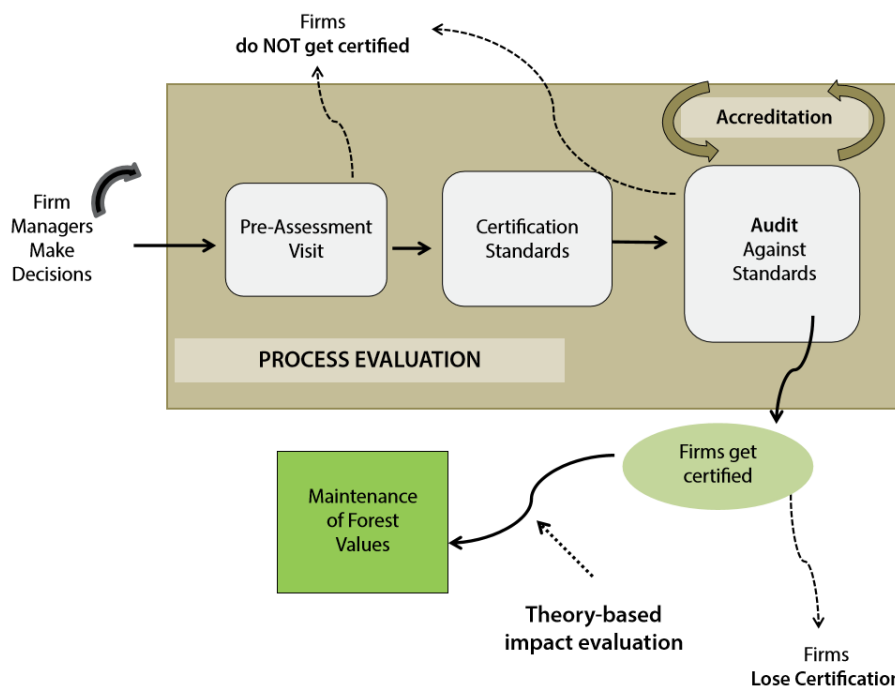


Figure 21: Key steps and decisions related with FSC certification process

The first component is the process evaluation (light brown shaded box), that aims at determining if the FSC certification interventions were implemented by managers of forest management units (FMUs) according to how it was designed. Key components of this evaluation are the activities of auditing, which provides an independent verification that

¹⁰⁴ Romero et al, 2015. The context of natural forest management and FSC certification in Indonesia. Occasional Paper 126. Bogor, Indonesia: CIFOR

operations in an FMU comply with FSC standards, and accreditation, which offers independent quality assurance of the auditing process. The process requires that evaluators bring the participation and engagement of parties involved in the implementation of the interventions.

The second component of the evaluation is a theory-based, empirical impact evaluation that aims to assess if the FSC interventions as designed and implemented, to achieve its goals. For this evaluation the field-based evaluator needs to draw on the expertise, and secure the participation of, a somewhat overlapping group of partners (e.g., NGOs, FMU managers and workers, local communities neighboring the forests, governments at more local levels; buyers).

An active learning community referred to as a Multi-Stakeholder Learning Platform - MSLP (Figure 22) should be deployed in this process. The initial outcome of this platform is an Evaluation Information System (EIS), which consists of the set of institutions (e.g., interested, participating, and affected parties), arrangements (e.g., confidentiality and other non-disclosure agreements), and processes (e.g., workshops, questionnaires) through which information should be collected, discussed, and will be shared, published, and routed back into the decision-making processes that encompasses forest management. Both the MSLP and the Evaluation Information System (EIS) will continue to be consolidated as the evaluation work progresses. Other partners also become members of the MSLP as the evaluation moves forward.

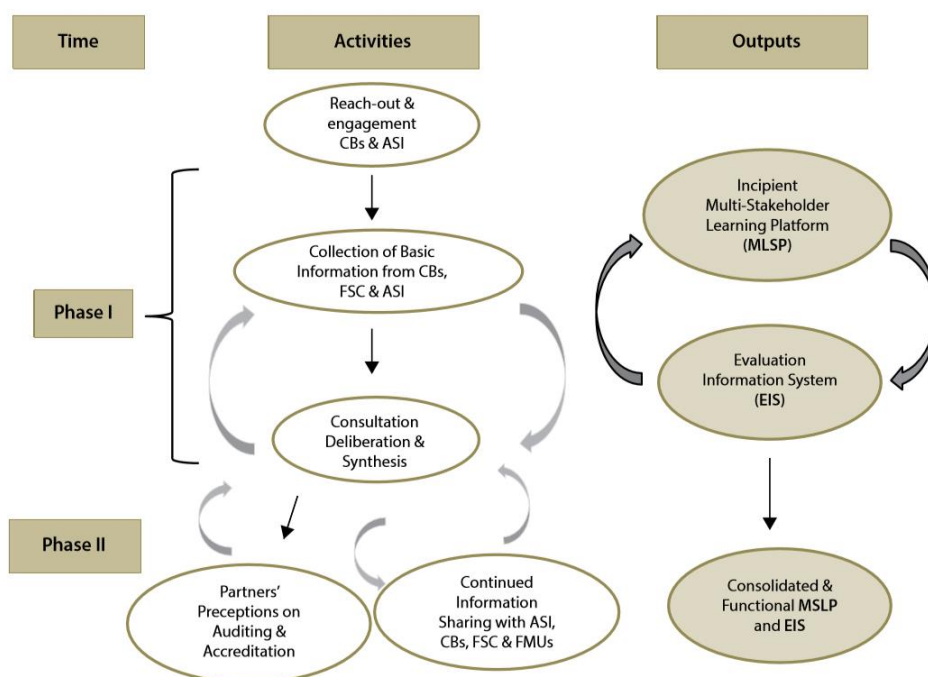


Figure 22: Operational process throughout the different stages of FSC standards evaluation¹⁰⁵

Romero et al, 2015¹⁰⁶ reveals that, members of the MSLP include representatives of organizations that have helped forest operations to become and remain certified; certifying bodies; active participants in audits; managers/selected workers of the forest operations;

¹⁰⁵ Romero et al, 2015. The context of natural forest management and FSC certification in Indonesia. Occasional Paper 126. Bogor, Indonesia: CIFOR

¹⁰⁶ Romero et al, 2015. The context of natural forest management and FSC certification in Indonesia. Occasional Paper 126. Bogor, Indonesia: CIFOR

NGOs/CSOs interested in forest resources and their management; consumer groups; and members of the evaluation team.

The maintenance of forest values (see Figure 21), can be at different stages along the process of becoming certified, which is generally reflected in different forest management practices (Figure 23). Thus, understanding where FMUs are on the certification continuum and the influence of different factors on self-selection into certification are fundamental for the design of appropriate evaluations. Once an FMU loses certification, its location on the management axis will depend on management practices employed, e.g., TANWAT Company in Njombe lost their certificate in 2012; they have not recertified their operations to date.

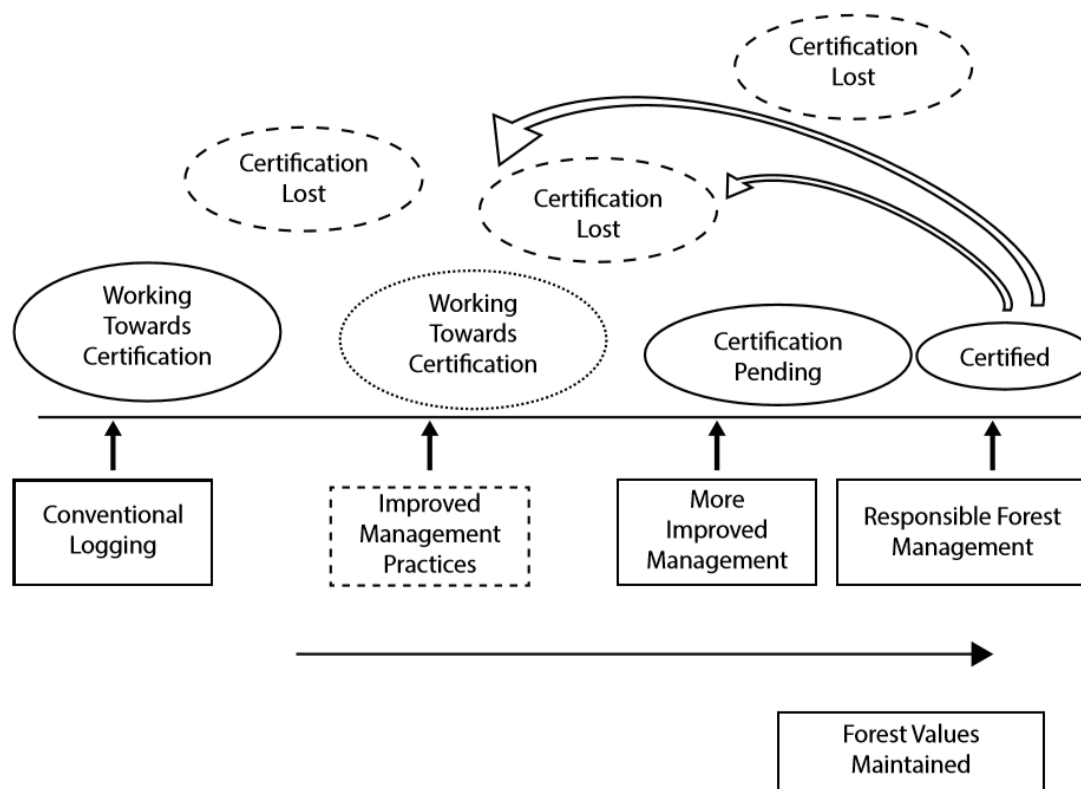


Figure 23: Certification continuum depicted as a stylized series of states superimposed on an axis that represents increasing responsibility of forest management and progression towards certification (ovals)¹⁰⁷.

Obtaining FC typically involves gradual adoption of a number of improvements in forest management¹⁰⁸. It is acknowledged that political and economic developments are both perceived and responded differently by various stakeholders at also different points in time. The cause-effect relationships proposed between certification and national and international political and economic events therefore need to be considered.

3.2.4.2. Action Plan: Fundamental measures

Despite their critical importance, forest resources have been faced with various problems, which prevented them from realizing their potential contribution to economic and social development as well as environmental conservation. The most significant include problems

¹⁰⁷ Romero et al, 2015. The context of natural forest management and FSC certification in Indonesia. Occasional Paper 126. Bogor, Indonesia: CIFOR

¹⁰⁸ Ruslandi, et al, 2014. Forest Stewardship Council Certification of Natural Forest Management in Indonesia: Required Improvements, Costs, Incentives, and Barriers. In: IUFRO-WFSE book "Forests under pressure: Local responses to global issues".

reduction of forest area and quality, environmental degradation of forest areas, loss of biodiversity, and loss of livelihoods of forest-dependent communities. These forest problems triggered global concern; thereafter non-state actors initiated the FC schemes, including FSC¹⁰⁹. FC has evolved as a promising market-based tool to promote SFM and involves assessing the quality of forest management and products in relation to a set of predetermined principles and criteria. The rationale for implementing FC include: meeting sustainable forest management goals improve quality of forest products (value addition), meeting customers' demand, accessing new international markets and improve the income of actors along the value chain, but also attaining social and environmental objectives of forest management.

Since the inception of FC in Tanzania in 2007, todate there are 3 Forest Management (FM) certificates with 227,688 ha certified and 3 Chain of Custody (CoC) Certificates (Figure 24).

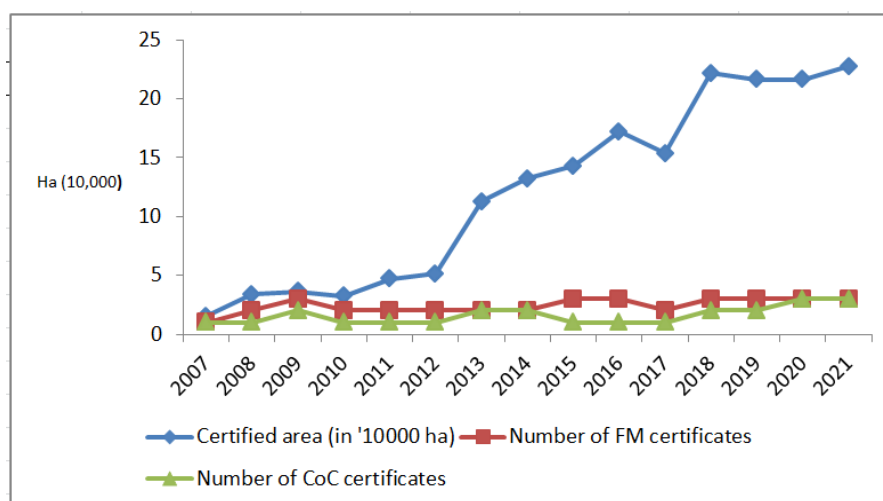


Figure 24: FSC Certification Status in Tanzania (2007-2021)¹¹⁰

Although the certified area shows increasing trend, the rate is relatively low compared to the certifiable forest resources available in the country. This is attributed to low awareness to the public, in particular forest owners/managers about certification and lack of premium price. A SWOC analysis identified inadequate public awareness as one of the factors contributing to charcoal certification implementation challenges in Tanzania (see Figure 17). This implies that concerted efforts and energy are needed for raising public awareness and hence promotion of FC in Tanzania. Public awareness is important to ensure effective and efficient implementation of charcoal certification. The stakeholders engaged along the value chain in the forest sector in Tanzania are going to benefit from the successful promotion and implementation of SFM because charcoal is a lucrative business, and significant contributor to the national economy accounting about 44.2% of the forest sector¹¹¹.

It has been observed that the efficient and effective promotion of FC in Tanzania requires exploiting the strengths and opportunities as well as addressing the weaknesses and challenges identified. This will be achieved through putting in place the necessary capacity, i.e., human, financial and physical resources, technical capability, an enabling

¹⁰⁹ AFF, 2019. The State of Forestry in Africa: Opportunities and Challenges. African Forest Forum, Nairobi Kenya. 186 pp.

¹¹⁰ FSC, 2021. FSC: Facts and Figure

¹¹¹ MNRT, 2021. The Contribution of Forest Sector to the National Economy

policy/legislation environment, appropriate institutional arrangements as well as marketing structures and information systems for certified forest products/services, including charcoal.

Deliberate measures should be considered such as capacity building for implementation of FC in Tanzania, and a training programme, specifically to local communities and government staff is recommended. The training is meant to create awareness and build the technical capacity and capability of the relevant stakeholders for FC implementation.

There is need to strengthen government institutions and law enforcement mechanisms to create an enabling environment for the FC process. Removing barriers to the market entry of forest products (charcoal export ban), e.g., lump charcoal produced sustainably from natural forests can strengthen Tanzania's participation in international trade of exports through enforcement of key regulations, e.g., certification and standards.

Criteria and indicators for SFM are an efficient framework to help Tanzania collect, store and disseminate reliable and scientifically-based information on forests in order to monitor and assess the state of forests. Approaches like the Modular Approach (for Group Certification Scheme) to FC can facilitate the implementation of charcoal certification in CBFM areas in Tanzania, i.e., adopting FSC standards for SFM within their own local context, and certify VLFRs under Group Certification scheme for multiple products. The forest management plan should provide clear management objectives, e.g., products to be produced such as timber, charcoal, fuelwood, nature-based tourism, NTFPs/NWFPs and ecosystem services.

Specific fundamental measures recommended include: Training in FC (FSC and TBS Standards); Tenure for land, trees and forest; Involve governments and other stakeholders in the process of FC (Political will and commitment); Clearly defined incentives - social, economic and environmental; Policy documents in place with clauses that support the process of certification; Incorporate aspects of certification within our policies on forestry, i.e. provisions on FC; Interested parties should be willing to allocate resources; human, financial and time; Proper documentation; Market access - Market and market structure for certified products; Sustainability; and Technology¹¹² and Value addition (Lump Charcoal to Briquettes). The detailed specific fundamental measures and the associated interventions are presented in the action plan (Annex 4). The plan acts as a road map detailing all the necessary interventions to be undertaken by the CoForEST project partners and other stakeholders to promote progress on charcoal certification to support socially inclusive and ecologically sustainable charcoal value chains.

4. Conclusion

The analytical objective of this study was to assess certification and standards for generating knowledge to inform the implementation of charcoal certification in CBFM areas in Tanzania. Document review, stakeholders' consultation and field surveys, as well as PESTEL-SWOC analyses were deployed for this assessment. Data and information gathered through PESTEL-SWOC analyses were analysed using qualitative methods and A'WOT quantitative analysis, which is a combination of Analytic Hierarchy Process (AHP) and SWOC analyses. It is concluded that:

¹¹² Zahabu, E. & L. Madadi 2020. Assessment of the Potentials for Sustainable Charcoal Production from Wood Waste Using Efficient Technologies in Village Land Forest Reserves in Tanzania. TFCG Technical Paper 47. p. 28

- Since FSC NFSS are voluntary in nature, to ensure effective implementation of charcoal certification in CBFM areas in Tanzania, they should be made compulsory. It is feasible to make it happen through the institution mandated (TBS) according to the laid down processes and procedures. The on-going process to adopt the NFSS by TBS is one of the ways to make it compulsory. When it is gazetted, it will be linked to other TBS standards such as TZS473:2019 & TZS1312:2010 to improve the charcoal value chain.
- The TBS standard on charcoal kilns, production, quality and species aims at improving production efficiency (e.g., carbonization) and quality of charcoal. This standard is inevitable to enable charcoal producers to produce charcoal that meets the minimum requirements for household use for both domestic and export markets. It is important that the standards are developed to provide incentives for sustainable charcoal production.
- The lump charcoal tested revealed that Kitunduweta Village charcoal did not have the required qualities as per TBS Standard (TZS 1312:2010), and hence unsuitable for household use. One of the possible reasons for low quality is inadequate carbonization. For the charcoal producer groups to qualify for FSC and TBS certification, quality parameters should be met. This implies that Kilns specs are required to ensuring feasible and profitable SCP in the project area.
- Despite the interests of stakeholders in certification, there is limited awareness and capacity for implementation of charcoal certification in Tanzania. The study shows that the implementation of charcoal certification in CBFM areas in Tanzania can proceed with FSC - NFSS and TBS (TZS1312:2010) standards as per prescribed fundamental measures presented in the action plan. The adoption of SFM practices employing FC implementation provides more opportunities to the sector's development compared to challenges. FC acts as a market-driven management and conservation tool. Its adoption and promotion would contribute to the wise use of forest resources, which would in turn, promote conservation values at the same time enhancing restoration of degraded forests and the socio-economic wellbeing of people who depend on forests. Tanzania has a fairly good enabling policies and legal frameworks for the implementation of certification. This is an opportunity that justifies why certification of charcoal and other forest produce should proceed.

5. Recommendation

The study findings reveal that there is an interest for certification among stakeholders, particularly on its contribution towards economics and market, socio-economic improvement, and policy. Despite this positive attitude; there exist some gaps between practice and the certification standards, especially for local communities that need to be addressed. Recommendations include the development of training programs for sensitization and capacity building, as well as curricular offerings on FC. The Sokoine University of Agriculture (SUA) has started a course on forest products certification for BSc students. However, lower cadres' academic institutions, e.g., Olmotonyi Forestry Training Institute should consider delivering certification and standards courses.

The FSC - NFSS should be linked to TBS standards to give it legal force during its implementation on the ground. Linking it to other TBS standards such as TZS473:2019 & TZS1312:2010 will widen its application scope and hence enhance its efficiency and adoption in improving responsible forest management and products value chain. The latter will be feasible and profitable if the TBS standard on charcoal kilns, production, quality and species is in place, complemented by TBS Standard TZS 1312:2010 to meet quality parameters for household use.

The NFSS covers forest management and forest products value chain, including charcoal production and trade. And TBS TZS1312:2010 provide for Wood Charcoal and briquettes standard. Given that these standards have not been applied in the project area, it is recommended that three charcoal producer groups VLFRs in Kilosa district i.e., Ulaya Mbuyuni, Chabima and Kitunduweta villages which were visited during this study be considered for certification as a pilot project for capacity building as per the action plan.

5.1. Implementation of charcoal certification with NFSS

The certification will be based on NFSS for FM and CoC certification of VLFRs for achieving multiple benefits (e.g., timber, charcoal, fuelwood, nature-based tourism, ecosystem services, NTFPs/NWFPs) through FSC group certification scheme. All the VLFRs in the three villages will have one certificate under the group scheme. Due to limited capacity of local communities, it is recommended to consider a possibility of hiring a technical service provider to develop and manage the system including gap analysis, first party audit (internal), documents' control, connect with market, etc on behalf of the communities. As part of capacity building to local communities, it is recommended charcoal producers to visit Namibia FSC-certified charcoal producers to learn about implementation of charcoal certification system.

5.2. Implementation of charcoal certification with TBS standards

The results for quality testing of lump charcoal from Kitunduweta Village showed that the charcoal did not meet the minimum requirements of the TZS1312:2010. This implies that the charcoal can't be certified by TBS for household use. Recommend samples be collected from the remaining two villages that were visited for testing as well. The villages that will meet the minimum requirement of the standard will have to apply for TBS certification using TZS1312:2010. As part of the application for the registration of the product (charcoal), the groups should be legal business entities registered and submit the application to TBS online (<https://oas.tbs.go.tz/>). The preparation on the ground includes, establish charcoal warehouses for grading, packaging, dispatch, etc. TBS will visit the sites for inspection and verification against the standard and then approve the charcoal to be TBS certified, should it meet the minimum requirements.

One of the possible reasons why the charcoal tested did not meet the minimum requirements of the standard is inadequate carbonization process. It is recommended that the development of standard on charcoal kilns, production, quality and species for SCP be prioritized.

Finally, during the implementation of charcoal certification, these standards (FSC and TBS) should be linked to leverage each other's merits and hence maximize environmental, social and economic benefits to producers, contributing to sustainable development to local community and the national at large.

6. Annexes

Annex 1: Notes - stakeholders' consultation meetings

Stakeholder Organisation	Persons met/contacted	Place/platform used for the meeting	Date
LGAs	DED Kilosa - Kisena Mabuba	F2F	6/10/2021
	DNRLO-Kilosa: Chewe	F2F	6/10/2021
	Env Officer-Kilosa: Amali Shebe	F2F	4-6/10/2021
	DFO-Kilosa: Josephin Lyimo	TEL	25/10/2021
	DNRLO/DFO-Morogoro Rural: Wahida Beleko	TEL	1/10/2021
	DFO-Mvomero: Kimweri	TEL	25/10/2021
	DFO-Mvomero: Avelina Maclaud	F2F	30/09/2021
	DFO – Kilwa: Njabha Lyatura	Momentive	17/10/2021
	Env Officer – Mafinga Town Council: Tuyi Charles	Momentive	19/10/2021
Issues discussed	<ul style="list-style-type: none"> • Understanding of the concept of SCP and it process • The SWOCs of SCP? • General of understanding of Certification and standards (FSC & TBS) 		
Summary of discussions:	<ul style="list-style-type: none"> • All the consulted staff indicated to have clear understanding of SCP and it process. However, acknowledge the existing challenge related to competition between sustainably charcoal and the illegally produced. 		

	<ul style="list-style-type: none"> • There was a limited knowledge and understanding of forest certification and standards amongst the LGAs staff. Emphasised a need for capacity building as part of the implementation of charcoal certification 			
Recommendations:	<p>A number of issues to be considered with regards to charcoal certification implementation:</p> <ul style="list-style-type: none"> • Training/capacity building to LGAs (districts, local communities) on forest/charcoal certification and standards • Establish market centres for sustainably produced charcoal 			
Stakeholder Organisation:	Persons met/contacted:	Place/platform used for the meeting	Date	
Government MDAs	Dr. Ezekiel Mwakalukwa	MNRT	Momentive	17/10/2021
	James Nshare	MNRT	F2F	9/10/2021
	Dr. John Richard	TAFORI	Momentive	17/10/2021
	Dr. Elisha Elifuraha	TAFORI	Momentive	17/10/2021
	Emmanuel Msoffe	MNRT	Momentive	17/10/2021
	Wanjala John	MNRT	Momentive	17/10/2021
	Dr. Deo Shirima	SUA	Momentive	17/10/2021
	Dr. Beatus Temu	SUA	Momentive	17/10/2021
	Prof. Zahabu Eliakimu	SUA	Momentive	17/10/2021
	Dr. Charles Kilawe	SUA	F2F	1/10/2021
	Prof. R. Malimbwi	SUA	Momentive	17/10/2021
	Anthony Sangeda	SUA	Momentive	17/10/2021
	Prof. Jumanne Abdallah	SUA	Momentive	17/10/2021
	Prof. Salimu Maliondo	SUA	Momentive	17/10/2021
	Someni Mteleka	TFS	Momentive	17/10/2021
	Miza Khamis Suleiman	DFNR/ZNZ	Momentive	17/10/2021

Dr. Abel Masota	TFS	Momentive	17/10/2021
Young Zeni	TFS	Momentive	17/10/2021
Prof. Dos Santos Silayo	TFS	Momentive	17/10/2021
Mr. Mohamed Kilongo	TAFORI	Momentive	17/10/2021
Dr. Samora Macrice	SUA	Momentive	17/10/2021
Dr. Celestine Balama	TAFORI	Momentive	17/10/2021
Prof. Reuben Mwamaki	SUA	Momentive	17/10/2021
Dr. Suzana Augustino	SUA	Momentive	17/10/2021
Prof. Felister Mombo	SUA	Momentive	17/10/2021
Prof. Shabani Chams	SUA	Momentive	17/10/2021
Prof. Ishengoma	SUA	Momentive	17/10/2021
Dr. Nancy Pima	TAFORI	Momentive	17/10/2021
DFC-Kilosa: Samwel Ny	TFS	Momentive	17/10/2021
DFC-Mvomero: Castory Chelela	TFS	Momentive	17/10/2021
DFC-Mvomero: Mbarouk Sinari	TFS	F2F	30/9/2021
DFC-Moro Rural: Mr. Msokwa	TFS	F2F	30/9/2021
Prof. Josiah Katani	SUA-Katavi	F2F	29/9/2021
Almasi Kashindy	Olmotonyi	Momentive	17/10/2021
SIDO: Ms Joan	SIDO-Moro	Momentive	17/10/2021
SIDO: Haika Shayo	SIDO-Moro	F2F	29/9/2021
Dr. Paul Deogratias	VPO-DoE	F2F	29/9/2021
Ms Martha Ngayowela	VPO-DoE	Momentive	17/10/2021
Dr. Emma Liwenga	VPO	F2F	8/10/2021
Joyce Msangi Ministry of Energy	DODOMA	Momentive	17/10/2021
Juhani	FORVAC	F2F	8/10/2021
Eric Mabewa	FORVAC	Momentive	17/10/2021
Alex Njahani	FORVAC	Momentive	17/10/2021
Leons Mshasha	FORVAC	Momentive	17/10/2021
Deusdedit Bwoyo	MNRT	Momentive	17/10/2021
Seleboni John	MNRT	Momentive	17/10/2021

	Philip Makaro Eng. Prosper Msasalaga - DQA Alfred Mapunda Margreth Fahima Chamani Elia Mtupile Michael H Nyachia Roberts	TBS TBS TBS Trade & Industry Trade & Industry PFPII PFPII PFPII PFPII	F2F Momentive F2F TEL TEL TEL Momentive Momentive Momentive Momentive	6/10/2021 17/10/2021 6/10/2021 6/10/2021 8/10/2021 8/10/2021 17/10/2021 17/10/2021 17/10/2021 17/10/2021
Issues discussed	<ul style="list-style-type: none"> • General understanding of SCP and its process. • Relevant policies and legislation supporting/recognising SCP in the country • Understanding of the SWOCs of SCP • Understanding of forest/charcoal certification and standards (FSC & TBS) • The advantages and disadvantages of certification and standards 			
Summary of discussions:	<ul style="list-style-type: none"> • The SCP concept is popular to all and the process is clear, although noted that while the model is well documented, the implementation on the ground is contrary to the document. This is due to limited capacity of the actors on the ground. • The government recognises forest certification, but does not provide clear guidelines on how to achieve it. • It was clear that charcoal is a very attractive business. However, it is operating informally and not coordinated, but also the lump charcoal export ban would act as stumbling block for certified charcoal to get into international markets. 			

Recommendations:	<p>A number of issues to be considered with regards to charcoal certification implementation:</p> <ul style="list-style-type: none"> • Charcoal Certification and standards recommended as a remedy to unsustainable production and consumption, • Charcoal business be formalized (producer groups be identified, registered and certified (FSC, TBS), • A very robust and inclusive training program on certification and standards be developed and delivered to all interested and affected parties.
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Stakeholder Organisation:	Persons met/contacted:	Place/platform used for the meeting:	Date:	
Private Sector:	Omary Ally Komba and General Supplies, Morogoro	OAK Workshop	F2F	29/9/2021
	ARTI Energy	ARTI Energy	Momentive	17/10/2021
	Donath R.Olomi	IMED	Momentive	17/10/2021
	Erneus Kaijage	Consultant	Momentive	17/10/2021
	Prof. Demel Teketay	Consultant	Momentive	17/10/2021
	TradeMark-EA			
	Severinus Jembe	Soil Association (SA)	Momentive	17/10/2021
	Hampers - GRL?	GRL	Momentive	17/10/2021
	Victor Kimey	GRL	Momentive	17/10/2021
	Isaac Malugu	Consultant	Momentive	17/10/2021
	Nsita Steve	Consultant	Momentive	17/10/2021
	Michal Brink	CMO	Momentive	17/10/2021
	Christian Potgieter	Consultant	Momentive	17/10/2021
	Kahana Lukumbuzya	Consultant	Momentive	17/10/2021
Jonathan Lane	Tractors Ltd	Momentive	17/10/2021	
Amar Shanghavi	Tanganyika Plywood			

	Andy Norman Benja Lane Ely Tractors Ltd Peter Tractors Ltd Immanuel Lobwite Antery Kiwale Francisco Shejamabu Berty - Wildhorus	Tanganyika Plywood Tractors Ltd Tractors Ltd Tractors Ltd Tractors Ltd Tanwat Tanwat UK	Momentive Momentive Momentive Momentive Momentive Momentive	17/10/2021 17/10/2021 17/10/2021 17/10/2021 17/10/2021
Issues discussed	<ul style="list-style-type: none"> • Understanding of their involvement in charcoal value chain, • Understanding of SCP and its process, • Any relevant policies and legislation supporting/recognising SCP in the country, • The SWOCs of SCP, • Understanding and their involvement in forest/charcoal certification and standards (FSC & TBS), <ul style="list-style-type: none"> ○ Are you certified with TBS/FSC standards? Which certification scheme, standards? ○ What are the advantages and disadvantages of it? 			
Summary of discussions:	<ul style="list-style-type: none"> • The sector is pro-successful business; hence aim at deploying all the tools that add value to their businesses including certification and standards. • One firm was subscribing to both FSC and TBS standards for charcoal, • Admitted of the limited general awareness/knowledge about certification and standards by the market, leading to no recognition of the quality certified materials in the market, • Government MDAs are not supportive enough to forest certification and standards initiatives, 			
Recommendations:	A number of issues to be considered with regards to charcoal certification implementation: <ul style="list-style-type: none"> • Forest/Charcoal certification is the way to go to promote sustainable charcoal business, 			

	<ul style="list-style-type: none"> • Capacity building to government MDAs and other private sector actors on certification and standards issues so that to enhance the adoption of the same on the ground; also this knowledge enable MDAs to create enabling and supporting environment to private sector, • Government make provision within the PPRA to acknowledge and accommodate procurement of certified products for government use.
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Stakeholder Organisation:	Persons met/contacted:	Place/platform used for the meeting:	Date:	
NGOs/CSOs/DPs:	Doyi M Lucy Magembe Jasper Makala Allen Mgaza Mary Swai Dr. Doris Mutta Alexander Mwalyoyo Azaria Kilimba Martin Asiiimwe Annah Agasha Steve Ball Paul Opanga AF - Kikolo Raphael Kastory Timbula Dr. Mathew Mpanda	IUCN TNC MCDI TRAFFIC TATEDO AFF TAREA WWF Tanzania WWF Uganda FSC Africa FSC Africa FSC Africa AF TTGAU EU	Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive Momentive	17/10/2021

Key Issues discussed	<ul style="list-style-type: none"> • Understanding of SCP and their involvement in the country and the region • Any relevant policies and legislation supporting/recognising SCP in the country • The SWOCs of SCP • Understanding of and engagement in forest/charcoal certification and standards (FSC & TBS)
Summary of discussions:	<ul style="list-style-type: none"> • Among the actors, some of them are proponents of the concept of SCP in Tanzania and the region. • WWF Tanzania had a pilot project in Dar and Kilwa late 2000s, and initiated scale-up of the TFCG Kilosa model to Ruvuma Landscape in 2016. • Certification and standards are voluntary in nature. However, the actors acknowledge the presence of statements about certification in the MNRT strategic plan and Forest Policy Implementation strategy, but there is no mention of the same in the forest legislation and policy recognising certification as a tool for SFM, • Technical and financial resources are available to facilitate the implementation of charcoal certification, • It was noted that there is sectoral conflicts among government MDAs, leading to lack of strategic guidance on how the charcoal sub-sector can be coordinated and developed.
Recommendations:	<p>A number of issues to be considered with regards to charcoal certification implementation:</p> <ul style="list-style-type: none"> • Capacity building to other NGOs/CSOs to advocate for certification and standards • Government MDAs be coordinated and agree who should take lead in the process of charcoal sub-sector development, • Forest legislation and policy should recognise certification and standards as tools for SFM, • Certification and standards (FSC, TBS) are recommended in the Tanzania as an approach to promote SFM.

Stakeholder Organisation:	Persons met/contacted:	Place/platform used for	Date:
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		the meeting:	
Local Communities – Charcoal producers (SCP):	Ulaya-Mbuyuni Village - Kilosa Chabima Village - Kilosa Kitunduweta Village - Kilosa	F2F F2F F2F	4/10/2021 5/10/2021 5/10/2021
Key Issues discussed	<ul style="list-style-type: none"> • Understanding of the rules governing SCP, • Understanding of the rules governing charcoal producers groups • Understanding of forest/charcoal certification and standards (FSC & TBS) • The need for forest/charcoal certification and standards 		
Summary of discussions:	<ul style="list-style-type: none"> • There was a very good grasp of the concept of SCP, and the rules governing the process, i.e., procedures and requirements. However, acknowledged the challenges associated with paper work (documentation and record keeping), • SCP products competition with illegally produced charcoal discouraged the groups to go mass production due to limited market for their produce, • All the groups had drafted constitution as part of the registration process. It was noted that no single charcoal producer group was registered, • The local communities admitted that they were not aware of forest/charcoal certification and standards with respect to SCP, and wanted to be trained on the same, • After the brief introduction of what certification and standards are, they all acknowledged the benefits the certification and standards could bring to their SCP process. Together, they agreed and did welcome the idea of certifying their operations to add value to the charcoal they produce 		
Recommendations:	A number of issues to be considered with regards to charcoal certification implementation:		

	<ul style="list-style-type: none"> • Communities/groups' interests to certify their SCP operations, as an opportunity, • Training: Awareness raising to communities/groups about certification and standards, including basic skills on document control/record keeping - this is very important for the implementation of certification and standards, • Facilitating the groups registration process as formal business entities – this will attract the illegal charcoal producers to join these groups, • Designating SCP products market centres
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Stakeholder Organisation:	Persons met/contacted:	Place/platform used for the meeting:	Date:
PO-RALG:	Joseph Chuwa Nanjiva G. Nzunda Salome John Abela Daniel Sanford Kway	RS-Morogoro RS-Morogoro RS-Morogoro RS-Morogoro PO-RALG, Dodoma	Momentive F2F F2F F2F Momentive 17/10/2021 30/9/2021 30/9/2021 30/9/2021 17/10/2021
Key Issues discussed	<ul style="list-style-type: none"> • The understanding of SCP and its process • The SWOCs of SCP • Understanding of forest/charcoal certification (FSC & TBS) <ul style="list-style-type: none"> ○ What are the advantages and disadvantages of it? ○ Would you like charcoal producer groups to be certified (FSC, TBS)? Why? 		
Summary of discussions:	<ul style="list-style-type: none"> • The PO-RALG sector cording unit and the RS - Morogoro are very aware of SCP in the country, and they are very supporting of TFCG's model and related initiatives, • The SCP model is a promising tool for SFM, 		


	<ul style="list-style-type: none"> • Illegally produced still rampant in the market competing with the SCP products, • Certification and standards, although not widely spread and adopted in Tanzania, experience from the region, e.g., charcoal certification in Namibia presents more benefits (social, environmental, economic) than disadvantages. • The charcoal producer groups subscribing to certification and standards is ideal in rescuing forest resources but also promoting local livelihoods and national economy at large.
Recommendations:	<p>A number of issues to be considered with regards to charcoal certification implementation:</p> <ul style="list-style-type: none"> • Strongly recommend and advocate for charcoal certification implementation • PO-RALG is the custodian of all LGAs, pursuing charcoal with local communities, fully engagement of PO-RALG for every step to be made is inevitable

Annex 2: Application for standard development

Annex 2a			
TANZANIA BUREAU OF STANDARDS			
PROCEDURE NO:	TITLE:	Approved by: Signed by DSD :	
DOC. TYPE:	Prepared by: Signed by SM:	Rev. No:	Effective date:
CONTROLLED			

Annex 2b			
TANZANIA BUREAU OF STANDARDS			
PROCEDURE NO:	TITLE:	Approved by: Signed by DSD :	
DOC. TYPE:	Prepared by: Signed by SM:	Rev. No:	Effective date:
CONTROLLED			

Proposer's Particulars	
Name:	Dr. SEVERIN KALONGA
Organization/Institution:	Environment and Forest Certification (EFC)
Postal address:	P.O BOX 6986, DAR ES SALAAM
E-mail:	severinkalonga@gmail.com
Telephone:	
Mobile:	+255 715 432 375
Proposal details	
Title of Standard	The FSC National Forest Stewardship Standard (NFSS) of Tanzania Mainland
Scope	To provide for standardisation applicable to all forest operations seeking FSC certification within Tanzania Mainland. The standard applies to Natural forests and Plantations, including Non-Timber-Forest Products (NTFP) and ecosystem services.
Standard/Company Specification/Manual (if any)	Standard
Remarks	Propose the adoption of NFSS
Proposers Signature:	Date: 17 th Sept 2021
	

Proposer's Particulars	
Name:	Dr. SEVERIN KALONGA
Organization/Institution:	Environment and Forest Certification (EFC) Ltd
Postal address:	P.O BOX 6986, DAR ES SALAAM
E-mail:	severinkalonga@gmail.com
Telephone:	
Mobile:	+255 715 432 375
Proposal details	
Title of Standard	ISO 38200:2018 - Chain of custody of wood and wood-based products
Scope	To provide for requirements for a chain of custody (CoC) of wood and wood-based products, cork and lignified materials other than wood, such as bamboo, and their products. The standard is intended to enable tracking of material from different categories of source to finished products, and also specify minimum requirements for input material. This standard is not applicable to forest management.
Standard/Company Specification/Manual (if any)	Standard
Remarks	Propose the development of the standard
Proposers Signature:	Date: 17 th September 2021
	

Annex 3a: Assessment of the Implementation of Charcoal certification operating environment using PESTEL-SWOC Analyses

Operating Environment	Internal Environment		External Environment	
	Strengths	Weaknesses	Opportunities	Challenges
Political	<ul style="list-style-type: none"> - National and international political will - High level commitment and leadership for SCP, e.g., MNRT-SP and Forest Policy Implementation Plan, i.e., Government policies and legal instruments in recognize FC - National FSC Forest Standards developed - Presence of TBS Standards for Charcoal - Existing guideline for SFM - The policies and legislation are in place and have provisions for SFM 	<ul style="list-style-type: none"> - Low visibility of SCP as national GDP contributor - Political interventions that are not supportive to forest management for charcoal production - Bureaucracy and red tape limits the development of charcoal VC, e.g., Charcoal export Ban - Poor policy enforcement - Inadequate Operationalization and enforcement of policies and legislation related to forest resources management and use 	<ul style="list-style-type: none"> - Development Partners' willingness to support the development of SCP through the adoption of certification standards. - Good will from NGOs/CSOs for supporting forest and eco-system related activities. - Country's commitment to the Paris agreement within the UNFCCC and Bonn Challenge which promote forest restoration and establishment - Increasing awareness on processes in forest certification standards - Objectives of forest certification and standards are in line with government policies on sustainable development - Presence of multi-stakeholder engagement focus on certification and standards (FSC, TBS) 	<ul style="list-style-type: none"> - Latent political tensions among government MDAs affecting the development of SCP - Changes in national priorities from supporting forestry (for biomass production) to other sectors - Corruption in the forest sector - Contestable land tenure - Political patronage
Economic	<ul style="list-style-type: none"> - Charcoal is a lucrative business. - Forest products, including charcoal on high demand at local, national, 	<ul style="list-style-type: none"> - Limited business planning skills - Low human and infrastructure capacity of responsible government agencies to implement their mandates 	<ul style="list-style-type: none"> - Premium market - Improved revenue/income - Diversified sources of income - Public Private Partnerships (PPP). - Local, National, Regional and 	<ul style="list-style-type: none"> - Market uncertainties - Competition between certified and uncertified products - Cost of maintaining

	<p>regional and global scale.</p> <ul style="list-style-type: none"> - Respected National forest agencies, attracting private investment and promoting a vibrant Public Private Partnerships (PPP) - Presence of good fiscal policies that can attract more foreign direct investment in the forestry sector, including charcoal sub-sector - Presence of forest resources and the products to be certified 	<ul style="list-style-type: none"> - Failure to enhance the role of charcoal as an economic engine to raise the value at the national level and among the people - Inadequate involvement of the private sector - Limited capacity to respond to the diverse emerging needs and demands of the charcoal sub-sector - Lack of financial incentives for individuals or the private for sustainable charcoal production/development - Non-differentiated markets between certified and non-certified charcoal - Lack of appropriate markets for certified charcoal, i.e., no existing markets and market structures for certifiable charcoal 	<p>global demand for certified forest products and services (including charcoal)</p> <ul style="list-style-type: none"> - There is a market link to the international market for certified charcoal 	<p>the certificate</p> <ul style="list-style-type: none"> - The increasing prices of energy (fuel and hydro-power) will translate into higher demand for alternatives from forests, e.g., charcoal, because forest loss is not incurred in the prices - Certified charcoal is competing with non-certified (i.e., illegally produced leading to Over-exploitation of forest resources - Lack of market incentives and motivation for certification
Social	<ul style="list-style-type: none"> - Existence of NGOs/CSOs, Environment and natural resources networks interested in good forest governance, including SCP - Competent staff with multiple skills and professional 	<ul style="list-style-type: none"> - Inadequate technical staff innovation to effectively cope with emerging Management protocols and development challenges in the charcoal sub-sector. - Ineffective partnership management leading to low 	<ul style="list-style-type: none"> - Job creation with good working conditions - Enhanced livelihood, Health and safety - Availability of strong networks and institutions e.g. Local Communities, Youth, Women, Religious groups, to exploit their forest resources sustainably where 	<ul style="list-style-type: none"> - Unemployment forcing people to utilize forests for charcoal unsustainable production - Inadequate awareness of the public about forest certification, e.g., charcoal certification

	<p>experience in the charcoal sub-sector</p> <ul style="list-style-type: none"> - Universities/ colleges training on forest certification - Adequate data and information to support certification activities - Availability of institutions and linkages that support forest certification 	<p>development of the charcoal sub-sector</p> <ul style="list-style-type: none"> - Limited involvement of social institutions in forest management - Limited legitimacy of agencies managing forest reserves - Weak coordination among institutions on SCP - Lack of awareness on procedures and requirement for SCP - There is no enough skilled personnel 	<p>they have power and influence over the same</p> <ul style="list-style-type: none"> - Availability of forest land managed by local communities - Increased engagement of the media in raising awareness and building action for sustainable charcoal production/development - Global pressure on certification standards adoption and avoidance of illegal forest products, including charcoal - Potential to develop certification skills at country level 	<ul style="list-style-type: none"> - Media not finding SCP as breaking news for their audiences - Low prioritization of certification and standards within many institutional strategies, e.g., PPRA - Absence of Accredited CBs and Auditors in the country
Technological	<ul style="list-style-type: none"> - Presence of SCP platform in place? to lead in the promotion and co-ordination of the development of the sub-sector for SCP technologically 	<ul style="list-style-type: none"> - Research and teaching curriculum in forestry institutions not practical enough to address emerging challenges, e.g., charcoal certification - Inadequate forestry research and development on SCP, e.g., Kilns efficiency, etc - Low levels of production and processing technologies especially in SCP, both within public and the private sector. - Inadequate forestry management information systems 	<ul style="list-style-type: none"> - Availability of advanced forestry mapping and monitoring technology options. - Use of technology to enhance forest management and monitoring of the whole charcoal VC. - Research, innovation and investment in SCP. 	<ul style="list-style-type: none"> - Unskilled personnel (technical and management). - Low IT capacity among stakeholders. - Rapidly changing technologies leading to costly emerging technological advances. - Low adoption of certification standards

		<p>within forest agencies.</p> <ul style="list-style-type: none"> - Limited and up-to-date data and information on SCP at national level. 		<ul style="list-style-type: none"> - Limited trained forestry professionals and technical cadre available from local institutions - Limited availability of technology and tools for supporting SCP
Environmental	<ul style="list-style-type: none"> - Improve on conservation - SCP enhances environmental Sustainability. - Certifiable forest resources are available and - identifiable - Availability of agencies facilitating certification such as WWF and AFF - Availability of various type of forests and products - Myriad of environmental stakeholders subscribing to 	<ul style="list-style-type: none"> - Unregulated sub-sector - Most of forest resources owners are not interested in certification - Market for certification is not well developed - Local consumers are indifferent to certified forest resources - Insufficient awareness among resource owners and consumers on forest certification 	<ul style="list-style-type: none"> - Environmentally conscious charcoal consumers are increasingly showing preference for charcoal from responsibly managed forests (certified), i.e., Forest manager direct forest management towards standards that are nationally, internationally accepted in order to cash in on this emerging niche market. - Growing interest for certification. - Existing unexplored markets for certified forest products - Increased interest in investing in certified charcoal 	<ul style="list-style-type: none"> - Increasing pressure on unsustainably produced charcoal likely to cause further biodiversity loss through countrywide over dependence on the same as a source of energy. - Existence of illegally produced charcoal in the market - High cost of certification and sustaining the certification - Lack of price differentiation in the market. Certification, therefore, is seen to have

	<p>certification standards</p> <ul style="list-style-type: none"> - Reduced pressure for natural forests as source of materials through CoC - Increased vegetation cover from increased forests under certification 			<p>no added value</p> <ul style="list-style-type: none"> - Land tenure: ownership of resources with no clear land tenure - Demand for agricultural land
Legal	<ul style="list-style-type: none"> - Presence of National Policies, legal and Institutional Frameworks that can promote sustainable charcoal production? - Presence of areas gazetted (with title deeds) for forest management 	<ul style="list-style-type: none"> - Compliance with certification is not compulsory - Lack of clear benefit sharing mechanisms with local communities for revenues accrued from SCP - Lack of clear laws regulating conversion of forests into other land uses such as farmland - Process of land acquisition - too much bureaucracy 	<ul style="list-style-type: none"> - Sustainable Development Goals. - Favourable constitutional dispensation, legislation and Regulations. 	<ul style="list-style-type: none"> - Not backed by rigorous Government policy and legislation - Lack of strategic guidelines on how to implement certification the ground at country level

<p>Governance</p>	<ul style="list-style-type: none"> - Quality assurance - Clear, structured processes in place for consultation, policy and decision-making in the forest sector - Availability of active certification schemes in the country (such as FSC) and TBS - Availability of technical capacity to implement certification schemes - Existing scheme (FSC) has successful case studies to demonstrate applicability in the country - Market availability 	<ul style="list-style-type: none"> - Lack of formal mechanism to ensure cross-sectoral linkages - Limited incentives for public-private partnerships for forest related initiatives - Forestry has not received due recognition as a sector, hence charcoal. - Inadequate capacity within implementing bodies to monitor and enforce relevant forestry policies and guidelines - Poor M&E Systems resulting in failure to improve the performance of the sub-sector - Complicated and cumbersome process for local resource owners - High transaction costs - FSC scheme seen as rigid 	<ul style="list-style-type: none"> - Capacity building (forest management planning skills, business and financial management) - Existence of a supportive legal framework across sectors - The country has ratified several international conventions and agreements that support sustainable forest management, hence SCP - Opportunities for domesticating standards for local application - Transparency & Accountability: Engagement of all interested and affected stakeholders - Adherence to policies and legislations 	<ul style="list-style-type: none"> - Difficult logistical arrangements, especially documentation - Weak institutional collaborations in the sector weakens law enforcement and harnessing from existing synergies - Competing interests among different sectors which often threatens sustainable forest management, SCP - FSC - rigidity
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Annex 3b: Assessment of the Implementation of Charcoal certification: SWOC Analysis (Key factors)

Internal Environment		External Environment	
Strengths	Weaknesses	Opportunities	Challenges
<ul style="list-style-type: none"> - Charcoal is a lucrative business - High level government political will and commitment and leadership for SCP certification, e.g., MNRT and VPO-DoE - National FSC Forest Standards developed - TBS Standards for Charcoal - Presence of forest resources and the products to be certified - Existence of NGOs/CSOs, Environment and natural resources networks interested in good forest governance, including SCP - Availability of institutions and linkages that support forest certification 	<ul style="list-style-type: none"> - Low visibility of SCP as national GDP contributor - Bureaucracy and red tape limits the development of charcoal VC, e.g., Charcoal export Ban - Lack of financial incentives for individuals or the private for sustainable charcoal production/development - Lack of appropriate markets for certified charcoal, i.e., no existing markets and market structures for certifiable charcoal - Weak coordination among institutions on SCP - Lack of awareness on procedures and requirement for SCP - Unregulated sub-sector - Market for certification is not well developed - Insufficient awareness among resource managers/owners and consumers on forest certification - Compliance with certification is not compulsory - Lack of clear benefit sharing mechanisms with local communities for revenues accrued from SCP 	<ul style="list-style-type: none"> - Government political will towards forest certification and standards (FSC, TBS) - Development Partners' willingness to support the development of SCP through the adoption of certification standards. - Good will from NGOs/CSOs for supporting forest and eco-system related activities. - Premium market, hence improved revenue/income - Job creation with good working conditions - Enhanced livelihood, health and safety - Global pressure on certification standards adoption and avoidance of illegal forest products, including charcoal - Environmentally conscious 	<ul style="list-style-type: none"> - High cost of certification and sustaining the certification - Latent political tensions among government MDAs affecting the development of SCP - Market uncertainties for certified forest products locally - Certified charcoal is competing with non-certified (i.e., illegally produced leading to over-exploitation of forest resources - Lack of market incentives and motivation for certification - Inadequate awareness of the public about forest certification,

<ul style="list-style-type: none"> - Improve on conservation - Quality assurance - Existing scheme (FSC) has successful case studies to demonstrate applicability in the country and the region 		<p>charcoal consumers are increasingly showing preference for charcoal from responsibly managed forests (certified)</p> <ul style="list-style-type: none"> - Opportunities for domesticating FSC standards for local application - Transparency & Accountability: Engagement of all interested and affected stakeholders 	<p>e.g., charcoal certification</p> <ul style="list-style-type: none"> - Absence of Accredited CBs and Auditors in the country - Lack of price differentiation in the market. Certification, therefore, is seen to have no added value - Complicated and cumbersome process for local resource owners, e.g., local communities - Limited business planning skills
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Annex 4: Action Plan

Fundamental Measures	Interventions needed	Responsible	Collaborating stakeholders	Timeframe
Awareness creation among stakeholders on FC (FSC and TBS standards)	Sensitization to government officials, charcoal producer groups and community at large through various media on certification and standards and their requirements	NGOs/CSOs (e.g., TFCG, MDCI, WWF, AFF, FSC Africa, etc), Development Partners	Government MDAs (FBD/TFS, TBS, Academic Institutions, etc)	2022-2025
	Promote SFM activities to make it easier for communities, companies, later to adopt certification and standards, in order to accelerate FC	NGOs/CSOs (e.g., TFCG, MDCI, WWF, AFF, FSC Africa, etc), Development Partners	Government MDAs (FBD/TFS, TBS, Academic Institutions, etc)	2022-2025
	TBS technical committee to visit charcoal production sites to identify the whole procedure deployed for SCP (and gaps if any) so as to inform the process for developing standards for charcoal kilns specifications	TBS	Government MDAs (FBD), LGAs, Private sector, NGOs/CSOs (TFCG, MDCI, WWF)	2022
	Inform authorities of the existence and importance of certification and standards	MNRT (FBD)	NGOs/CSOs (e.g., TFCG, MDCI, WWF, AFF, FSC Africa),	2022

	in the forest sector (including launch of NFSS)		Development Partners, private sector	
	Sustainability: Demonstrate the benefits of FC for SFM to stakeholders; Propose arrangements for learning excursions to areas with certified forests, e.g., Namibia, Mkaa Endelevu - Mafinga	TFCG	Certificate holders (private sector), NGOs/CSOs (e.g., MDCI, WWF, AFF, FSC Africa, etc), Development Partners	2022
	Encourage participants to build awareness on FC in their areas, and Sensitise stakeholders on the demand for certified products in the local and international markets, e.g., Value addition (Lump Charcoal to Briquettes)	NGOs/CSOs (e.g., TFCG, MDCI, WWF, AFF, FSC Africa, etc), Development Partners	Government MDAs (FBD/TFS, TBS, Academic Institutions, etc), Private sector	2022-2025
	Engage key players in the policy and legislative operationalization processes to understand how FC helps and benefits the local communities and national economy, and hence include certification among the potential interventions in forest management	TFCG	NGOs/CSOs (e.g., MDCI, WWF, AFF, FSC Africa, etc), Private sector, Government MDAs (FBD/TFS, TBS, PPRA)	2022-2025
	Formalization or registration (by the government) of	Producer groups	LGAs, SIDO	2022

	charcoal producer groups as business entities with support from SIDO, coach them on proper document control, planning and business skills			
	Develop and establish certified charcoal 'Market centres'	TFCG	Community Producer groups, Private sector, LGAs, Government MDAs (TFS/FBD, PPRA, PFPII, FORVAC)	2022-2025
Capacity building in FC	Promote the inclusion of FC in forestry curricula (FC in the existing forestry syllabus) in all relevant academic institutions, and emphasize it to make students appreciate its importance	MNRT (FBD)	Academic Institutions, NGOs/CSOs (e.g., MDCI, WWF, AFF, FSC Africa, etc), Private sector, Government MDAs (TBS, PPRA)	2022-2025
	Initiation of FSC Group Certification Scheme for VLFRs - FM/CoC - Certification process: Gap analysis against the FSC Standards (FM/CoC), and address all the gaps identified before applying for certification	TFCG	NGOs/CSOs (e.g., MDCI, WWF, FSC Africa), LGAs, Producer groups, Development Partners	2022
Mobilise forest resource owners and/or managers to participate in FC	Mobilizing local communities and CBOs into groups for FC, i.e., partnering with groups that	TFCG	NGOs/CSOs (e.g., MDCI, WWF, AFF, FSC Africa, etc),	2022-2025

	are interested in promoting FC among forest owners, managers, users (Design projects aimed at helping local communities to be organized and apply for certification)		Private sector, LGAs and Regional Secretariats, Government MDAs (TBS, FBD/TFS)	
	Training and capacity building to ensure sustainable funding for the FSC scheme (business skills, planning, etc)	TFCG	Obuntu Hub (https://obuntuhub.co.tz)	2022
	Interested parties, willingly allocate resources, human, financial and time; and ensure they adhere to the FSC principles and criteria, once certified	Formal Groups	FSC Group Certification Manager, Technical service provider	2022-2023
Highlight the role of research in FC	Promote research studies in FC, such as cost-benefit analyses of FC	TFCG	Research institutions, Consulting firms	2022
	Identify scientists as key players to collaborate in driving forward the certification process	TFCG	NGOs/CSOs (e.g., MCDI, WWF, AFF, FSC Africa, etc), Private sector, Government MDAs (TBS, FBD/TFS)	2022
	Further analyses of various certification schemes and standards to make future informed decision	TFCG	NGOs/CSOs (e.g., MCDI, WWF, AFF, FSC Africa, etc), Private sector, Government MDAs (TBS, FBD/TFS)	2022

Integrate FC into national forest policies	Incorporate certification requirements in policies ensuring SFM, i.e., influence inclusion of FC clauses in national forest policies, and prepare guidelines and standards to certify potential forests and products	MNRT (FBD)	NGOs/CSOs (e.g., TFCG, MCDI, WWF), LGAs, Producer groups, Government MDAs (TBS, TFS) Development Partners	2022-2025
	'Export Ban' for Lump charcoal - advocate for certified lump charcoal from natural forests be exported (Charcoal Strategy should state ' <i>sustainably produced charcoal from Natural Forests can be exported</i> ').	NGOs/CSOs (e.g., TFCG, MCDI, WWF), LGAs, Producer groups, Private sector, Development Partners	Government MDAs (TBS, PPRA, TFS/FBD, Industry & Trade)	2022
	Technology and innovation - Kiln standards to be developed, Pilot mobile kilns in collaboration with Mkaa Endelevu and PFPII.	TFCG	Community Producer groups, Private sector (Mkaa Endelevu), LGAs, Government MDAs (TFS/FBD, TIRDO/TBS, PFPII, FORVAC), NGOs/CSOs (e.g., AFF, MCDI, WWF)	2022
	Tenure for land, trees and forests	Government MDAs (TFS/FBD, Agriculture, Lands),	NGOs/CSOs (e.g., AFF, MCDI, WWF), Private sector, Development Partners	2022-2025

	Involve governments and other stakeholders in the process of FC (Political will and commitment)	NGOs/CSOs (e.g., TFCG, MCDI, WWF),	Government MDAs (FBD/TFS, TBS, PPRA), LGAs, Private sector, Development Partners	2022-2025
	Clearly defined certification incentives - social, economic and environmental	TFCG	Government MDAs (FBD/TFS, PPRA, Industry and Trade)	2022-2025
	Policy documents in place with clauses that support the process of certification, i.e., Incorporate aspects of certification within our policies on forestry, i.e. provisions on FC	MNRT (FBD)	NGOs/CSOs (e.g., AFF, MCDI, WWF), Private sector, Development Partners,	2022-2025
	Market access: Market and market structure for certified products.	PPRA	Private sector, NGOs/CSOs, Development Partners	2021-2025

