



Sustainable Development Verified Impact Standard

INSTALLATION OF HIGH EFFICIENCY WOOD BURNING COOKSTOVES IN KENYA



Document Prepared by

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Project Title	Installation of high-efficiency wood-burning cookstoves in Kenya
Version	1.7
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Project Location	Republic of Kenya
Project Proponent(s)	<u>C-Quest Capital SGS Stoves Private Limited</u> Ken Newcombe, CQC-Operations@cquestcapital.com; 1 (240) 491 - 2650
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Project Lifetime	06 October 2020 to 05 October 2030; 10-year lifetime
History of SD VISTa Status	No previous attempts at SD VISTa certification made to date
Other Certification Programs	VERRA Verified Carbon Standard (2349)
Expected Future Assessment Schedule	Initial validation/verification anticipated in 2024

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1 SUMMARY OF SDG CONTRIBUTIONS

Table 1: Summary of Project SDG Contributions

Row number	Estimated Project Contribution by the End of Project Lifetime	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Section Reference	Claim, Asset or Label
1	The project activity by replacing 500,000 traditional cookstoves with energy-efficient project cookstoves will contribute to improved health and well-being brought about by reduced levels of fine particulate matter (PM _{2.5}) emissions within households by approximately 47% ¹ below baseline emission level of 3.9 g/kg ² fuel.	3.9 ³	Project-specific indicator: Proportion of individuals reporting improved health status after adoption of project stoves (attributable to reduced exposure to air pollution during cooking)	Implemented activities to increase	3.2#1	SD VISta labelled VCUs
2	Contribute to increasing vocational and relevant skills of local individuals by providing non-formal education and training on issues related to	4.3 ⁴	Project-specific indicator: Number of individuals who received any informal training to enable their	Increase	3.2#4	SD VISta labelled VCUs

¹ Executive Summary: Impact Analysis of Malawi Rural Wood Stove and Jet Flame Kit Program

² PM2.5 emissions from three stone fire. Source: Clean Cooking Catalog

³ <https://unstats.un.org/sdgs/metadata/>

⁴ <https://unstats.un.org/sdgs/metadata/>

	<p>climate change, with specific skill-building in operations and surveying activities related to stove distribution and its monitoring under VCS.</p> <p>The project program will lead to producing 50 trained professionals in Kenya.</p>		<p>employment in project activity or elsewhere.</p>			
3	<p>Contribute to reducing drudgery and reducing gender inequality, especially for women and children by saving time spent in collecting fuel wood and cooking, considered at an average of 2 hour/day, per household, for rural areas using an open fire or similar traditional cook stove. The project will lead to time savings by approximately one hour every day⁵ and associated reduction in drudgery in 0.25 million households translating to benefiting an equal number of women as they are primary cooks and fuelwood collectors in most of the households⁶. The women can use the time saved for doing more productive activities or personal care.</p>	5.4	<p>Project specific indicator: Time spent on unpaid domestic and care work, by sex, age, and location.</p>	Decrease	3.2#2	SD VISta labelled VCUs

⁵ [Berkeley Air Monitoring Group: Effects on gender-related outcomes after the introduction of improved cookstoves in rural Zambia](#)

⁶ [What's in a stove? A review of the user preferences in improved stove designs - ScienceDirect](#)

4	Contribute to increasing access to clean cooking technology with 0.5 million TLCRS installations in Kenyan households that have been using traditional three-stone fire, over the project lifetime.	7.1	Project Specific Indicator: Number of improved cookstoves distributed in the project area.	Increase	3.2#5	SD VISta labelled VCUs
5	Contribute to the generation of employment in the informal sector (total economy, agriculture, and non-agriculture) by contracting locals with target employment of 50 employees for varying lengths of time over the project lifetime with a focus on hiring females. Employment comprises all persons of working age who, during a short reference period (minimum one week), or full time (more than 6 months) will be engaged in any activity to produce goods or provide services for pay or profit.	8.3	Project Specific Indicator: Number of local individuals employed during the project lifetime.	Increase	3.2#3	SD VISta labelled VCUs

6	Contribute to GHG emission reduction through an estimated reduction of ~73.83 tCO _{2e} per stove due to replacement of baseline stoves with TLCRS over 10 years of crediting period.	13.0	Tonnes of greenhouse gas emissions avoided or removed.	Increase	VCS validation report	SD VISta labelled VCUs
7	Contribute an estimated reduction in removal of non-renewable woody biomass to the tune of ~36.04 tons per stove over the 10 years of crediting period, from forests surrounding the communities thereby leading to an increase in above ground biomass in these forests.	15.2	15.2.1 Progress towards sustainable forest management by increasing above-ground biomass in forests	Implemented activities to increase	4.2#1	SD VISta labelled VCUs

2 PROJECT DESIGN

2.1 Project Objectives, Context and Long-term Viability

2.1.1 Summary of Project Sustainable Development Objective(s)

C-Quest Capital LLC’s (CQC) Improved Cookstove (ICS) project – “Installation of high efficiency wood burning cookstoves in Kenya” will enable household level access to clean and modern energy in the community of Kenya by, distributing, installing, and maintaining fuel-efficient ICSs in Kenya, and contribute to overall sustainable development and improving the well-being of the community. The project aligns with and will contribute to sustainable development objectives, as outlined in Table 1: Summary of SDG Contributions. Through the distribution and implementation of TLCRS, this grouped project aims at (1) reducing demand for wood fuel, (2) curbing local deforestation, (3) reducing the drudgery of collecting wood fuel– performed mainly by women and children, (4) reducing time spent on cooking over open fires, which results in extended exposure to toxic smoke, (5) increasing time spent on improving quality of life i.e., through economic endeavors and knowledge dissemination and, (6) improving the health status through reduced exposure to household air pollutants (HAPs).

The project can be defined in several thematic buckets that reflect the key pillars of sustainable development namely- (a) Economic well-being, (b) Social Well-being, and (c) Environmental well-being.

	SDG Goal Addressed	Target beneficiary	Impact envisaged through the project's lifetime
Economic Well Being	SDG 8	Employees hired during various stages of project implementation & operation	50
Social well being	SDG 3	End-user households with a focus on women who are primary cooks	0.25 million households are expected to experience reduced indoor air pollution.
	SDG 4	Staff receiving non-formal education & training	50

	SDG 5	Women and girls	0.25 million women who are primary cooks in the 0.25 million households
	SDG 7	End-user households	0.25 million project beneficiary households will have access to clean technology which they would not have been able to afford.
Environmental well being	SDG 13	Natural Capital	Avoided emissions to the tune of ~73.83 tCO ₂ e per stove over the 10-year crediting period
	SDG 15	Natural Capital	Avoided removal of approximately ~36.04 tons of non-renewable woody biomass per stove over the 10-year crediting period, from forests surrounding the communities.

Each of the SDGs achieved through the present project activity is discussed in detail in the following paragraphs-

1. Economic Wellbeing

The project will provide access to a basic service, i.e., modern energy in the form of clean cooking alternative to the rural and peri-urban communities of Kenya. The project will lead to a distribution of 0.5 million energy-efficient ICS throughout its lifetime. Thus, the project will achieve:

- **SDG 8:** Contracting of individuals on full-time and part-time basis with a focus on hiring local people and women (8.3)⁷. The employment will be generated for project implementation (including stove distribution and installations, spot checks and periodic surveys for ensuring streamlined operations of the project). In the short term, teams of local men and women will be employed and trained to make bricks and build stoves.

2. Social Wellbeing

The project is envisaged to improve the overall social well-being within the project implementation area by yielding human health benefits, increasing awareness levels, reducing gender inequality, and providing access to clean cooking technology to economically weaker sections of the society

⁷ Applies to employment of staff at full and productive levels with decent work for all, specifically in non-agriculture employment with equal pay for work of equal value across sexes – the ethos of SDG 8.

that does not have affordability and access to this technology. Each of the benefit aligned with respective SDG has been explained in the following points:

The projects will address SDG 3, SDG 4, SDG 5, and SDG 7 in the following ways:

- **SDG 3:** Reduced emission of fine particulate matter (PM_{2.5}) resulting in lowering of household air pollution due to use of the TLCRS, improving well-being for women and children (3.9)⁸.

Apart from improving the health of women, the stoves also reduce accidental burns in infants and children due to its design comprising of a closed combustion chamber and stable base.

- **SDG 4:** Contribute to increasing vocational and relevant skills of local individuals by introducing them to issues related to climate change, and bring awareness about importance of sustainable development, health, nutrition, and well-being, through formal and informal training which will enhance their avenues for getting decent jobs and employment opportunities (4.3).

The employed individuals will be provided with regular trainings and capacity building sessions to enhance their vocational skills related to various aspects of project implementation and monitoring which would increase their employability and chances of getting long-term employment even after the completion of the project. Field staff, also known as “health promoters” (HPs) will be specifically trained in stove construction. Some of the HPs will be trained to work as ‘enumerators’ and carry out stove registrations, captured through a mobile phone application that sends captured information to an online cloud database.

- **SDG 5:** Reduce women and children’s drudgery by in reducing time spent cutting, collecting, and carrying firewood from trees far removed from households and reduce time spent cooking over toxic smoky open fires. These tasks are a major cause of gender inequality in rural communities of Kenya which will be addressed by the project activities by providing the women folk and children with opportunities to involve in more productive activities (5.4)⁹.

By switching the fuel to small, twig-sized pieces of woody biomass, women, and girls save upon the time required for cutting, collecting, and carrying heavy wood over long distances. Also, as the CQC TLCRS burns at a higher temperature, with less fuel, due to combustion chamber and stove design, cooking the day’s meal takes approximately an hour less than it would take to cook the same meal over the TSF. Research by Berkeley Air Monitoring Group¹⁰, showed approximate time saving of 2 hours/day by switching to two stoves per household from the TSF. Furthermore, a meta-analysis of all research

⁸ [Amegah A. K., 2020.](#)

⁹ [K.Das et al., 2019.](#)

¹⁰ [Berkeley Air Monitoring Group, 2020.](#)

into time savings from ICS showed the average time savings across sub-Saharan Africa to be about one hour per day.

Children, particularly girls, are frequently kept at home to support household chores, like cooking and collecting firewood, estimated on average to be 10 hours per week, by switching to TLCRS more time can be dedicated to education – attending school and studying^{11, 12}

- **SDG 7:** The primary activity under the project is distribution of clean cooking project stoves to sections of the Kenya population that are predominantly reliant on wood fuel for meeting their cooking need and are unable to afford improved cookstoves. As clean cooking technology are an essential tool for addressing energy poverty and ensuring sustainable energy security in approximately 0.25 million households in Kenya during the project lifecycle, the project will generate an overall positive impact on the community.

3. Environmental Wellbeing

The distribution of efficient cookstoves is expected to reduce fuelwood consumption for cooking purpose which not only will reduce the amount of emissions being released in the atmosphere but also will reduce the burden on forest ecosystems in and around the project area. Thus, the project will contribute to SDG 13 and SDG 15 in the following ways:

- **SDG 13:** Reduce carbon emissions by approximately 73.83 tCO_{2e} per stove from the reduction in burning solid fuels for cooking in the household, this does not include black and brown carbon (13.0)
- **SDG 15:** Increase in non-renewable woody biomass by ~36.04 tons, per stove, in the project lifetime (15.2)

Forest, being a common pool resource, is used for collection of fuelwoods, which significantly contributes to forest deforestation and degradation. The distribution of TLCRS will reduce fuelwood consumption, thereby reducing the pressure on forests.

2.1.2 Description of the Project Activity

Installation of High-Efficiency Wood Burning Cookstoves in Kenya, a low-emission climate-resilient initiative by a CQC, was developed in response to the need to reduce greenhouse gas emissions (GHG) to address the rising climate catastrophe that largely impacts the most vulnerable populations that reside in Sub-Saharan Africa. The project focuses on the underprivileged in rural and peri-urban areas who cook over open flames ('three-stone fires cookstoves' (TSFs)). The project activity is designed to facilitate household level improvements in cooking amenities and improved health and well-being for women, girls, and children with benefits to all the members of the household^{13,14}.

¹¹ [Clean Cooking Alliance, n.d.](#)

¹² [Makonese et al., 2017.](#)

¹³ [Mortimer, K., et al., 2017.](#)

¹⁴ [Sharma & Jain, 2019.](#)

The primary activity under this grouped project, is installation of ICSs

Improved Cookstoves (TLCRS): The primary project activity is the distribution and installation of the TLC Rocket Stove (TLCRS), a high-efficiency, long-life metal and (made from local material) brick stove that transitions households away from traditional open fire cooking to cleaner, more efficient cooking solutions with renewable biomass fuels. The TLCRS is offered in exchange for in-kind contributions of materials and labor only, as the rural population's disposable cash is limited, and employment, where possible, is often informal and operates external to the cash economy.

In contrast to the traditional TSF, ICS strengthens the combustion efficiency and thermal transfer to the vessel by incorporating a number of cutting-edge elements, including one or more of a 'rocket elbow'; a highly insulated combustion chamber that provides a conducive environment for clean and efficient combustion of wood. This significantly increases the efficiency of the stove and hence reduces the fuelwood consumption in comparison to the baseline stoves.

TLCRS includes a total of 15 bricks, which will be handcrafted by families using locally available clay, the block is 22.5cm x 11cm x 6.5cm on average. A mixture of 5 liters of clay, sand, manure/cow dung, and water will be used to bind the bricks together. To improve combustion and heat transport, metal components have been incorporated into the design. This results in less heat loss and better insulation. Figure below represents a TLCRS stove that is being provided in Kenya households.



Figure 1: TLC Rocket stove (TLCRS)

The stove includes a metal top that allows the pot to sit higher, boosting airflow into the combustion chamber and out the top. An adjustable aluminum pot skirt ensures more efficient heat transfer from the fire to the pot while also helping to deflect wind.

It also uses a metal stick support that lies in front of and slightly within the stove opening and serves as a firewood feeding station. This maintains sufficient airflow while feeding the fuel into the combustion chamber, resulting in complete wood burning. The overall design of the stove ensures an average thermal efficiency of 34.5% as estimated through the water boiling test (WBT) conducted by the Aprovecho Research Centre.

The following table represents the technical specifications of the TLCRS being installed under the project activity.

Table 2: Technical Specification of TLC Rocket Stove

Parameter	Technical Specifications
Stove Size	Depth: 35 cm
	Width: 35 cm
	Height: 28 cm
Combustion Chamber Size	Depth: 12 cm
	Width: 12 cm
	Height: 28 cm
Efficiency	34.5%
Average Life	10 years

Furthermore, CQC uses an innovative digital platform to track and manage the ICS project. Education and training of field staff is an important component of project implementation. Using smartphones, CQC and its implementing partners administer various surveys and questionnaires to track project objectives, beneficiary information, and to monitor and evaluate implementation performance.

The following figure represents the TLCRS distribution and project cycle:

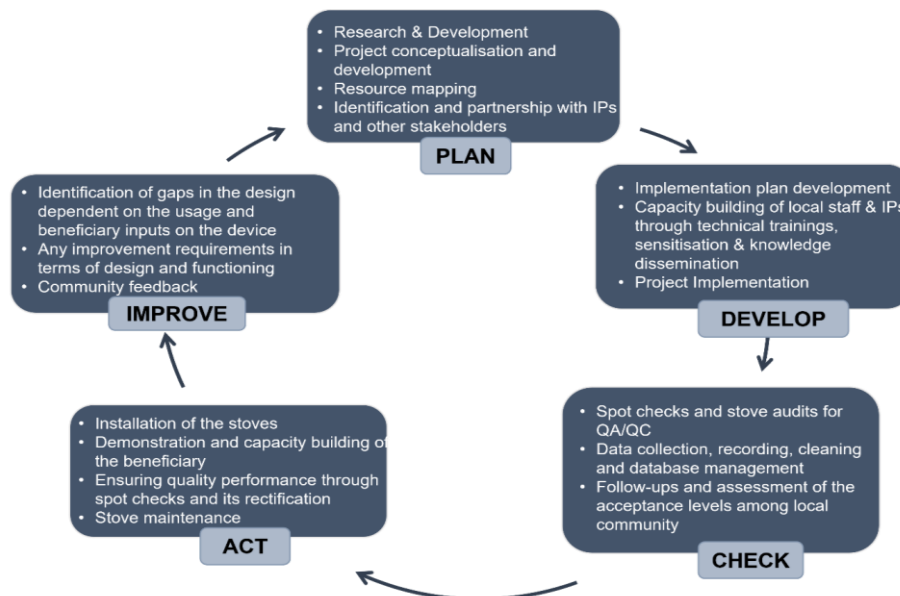


Figure 2: Project Cycle

The associated benefits of this primary activity on the local community and ecosystem have been detailed in the section above. Apart from the primary activity, the secondary activities under the Grouped project and their impacts are as follows:

Stove Champions Program. The Stove Champion (SC) program is a unique program under which the most successful health promoters are selected and trained to service 500-1000 households and be in direct communication with their female clients. SC's undertake a minimum of one annual visit post-wet season to each household receiving a stove and ensure repairs are made following storm damage and users follow best practices in stove management upkeep and repair. The key objectives of the SC program are to address any communication deficiencies and reiterate stove benefits and good practice in stove use and maintenance and maximize the benefits of improved stove use and ventilation to women, children, and the environment. SCs are paid on a monthly basis and performance incentives are also considered based on stove built and registered.

Trainings: Training is an integral part of any project implemented by CQC. While training its staff, CQC undertakes an introductory course on climate change including impacts of household pollution on health and well-being, which builds a background on the importance of efficient cookstove intervention. Apart from course, throughout the process of implementation of the project, be it during stove registrations, monitoring surveys, maintenance schedules etc., the staff is provided with numerous opportunities to upgrade their skills, which help them not only to undertake activities in the said project but also improve their future employability prospects. These training help generate positive impacts on community groups by enabling community members to build alternative skills and build capacity. These interventions are expected to advance socio-economic status, generate greater community capacity for sustainable livelihoods, and increase climate resilience.

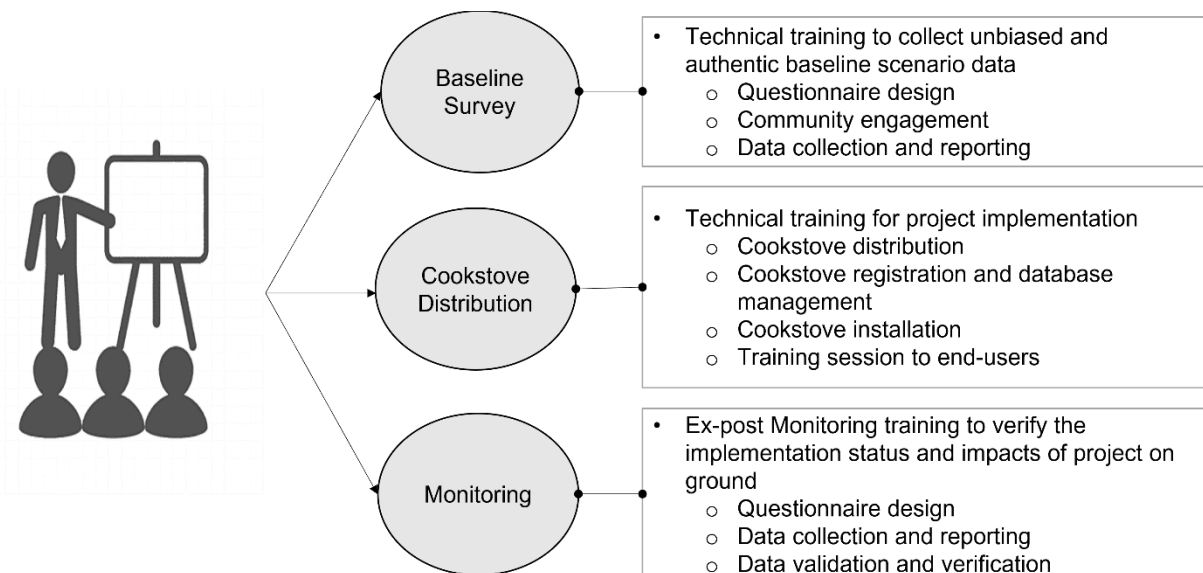


Figure 3: Trainings conducted during various stages of the project cycle

2.1.3 Implementation Schedule

Date	Milestone(s) in the Project's Development and Implementation
06-October-2020	Project Start date: Project Activities commence with TLCRS installations
28-October-2020	Listing of VCS PD on VERRA
13-May-2022	Registration of project under VCS
25- May-2022	CQC submits the projects documents to VERRA for listing under SD VISTA Program
20 September 2022	Listing of SD VISTA PD
20 November 2021 to 13 December 2021	Monitoring for MP 06-October-2020 to 31-August-2021
23 May 2022 to 17 June 2022	Monitoring for MP 1-September-2021 to 28-February -2022
28 November 2022 to 14 December 2022	Monitoring for MP 1-March-2022 to 15-September -2022
26 May 2023	Issuance for the third Monitoring Period
October 2020 – October 2030	Concurrent monitoring and evaluation
05-October-2030	The 10-year project validation period concludes with a projected 0.5 million additional stoves installed.

2.1.4 Project Proponent

Organization Name	C-Quest Capital SGS Stoves Private Limited
Role in the Project	Project Proponent
Contact Person	Ken Newcombe
Title	Director

Address	38 Beach Road #29-11, South Beach Tower, Singapore
Telephone	+1-202 247-7976
Email	cqc-operations@cquestcapital.com

2.1.5 Other Entities Involved in the Project

No other entity is involved with the CQC-TLCRS Project.

2.1.6 Project Type

This is a non-AFOLU (agriculture, forestry, and other land use) grouped project with general sector contributions identified in the chart below, primarily energy efficiency.

SD VISta Sectoral Scopes	U.N. Sustainable Development Goals
Sectoral Scope 2 - Climate Change Adaptation	Climate Action 13.0 Life on Land 15.2
Sectoral Scope 3 - Education	Vocational Training for Implementation Partners 4.3
Sectoral Scope 4 - Energy	Affordable energy 7.1
Sectoral Scope 7 - Health	Good Health and Wellbeing 3.9
Sectoral Scope 10 - Livelihoods	Decent Work and Economic Growth 8.3
Sectoral Scope 14 - Women's Empowerment	Gender Equality 5.4

2.1.7 Project Location

The project location will be the geographical boundary of Republic of Kenya with coordinates 0°1'24.8" S latitude and 37°54.372' E longitude.¹⁵

¹⁵ <https://www.geodatos.net/en/coordinates/kenya>

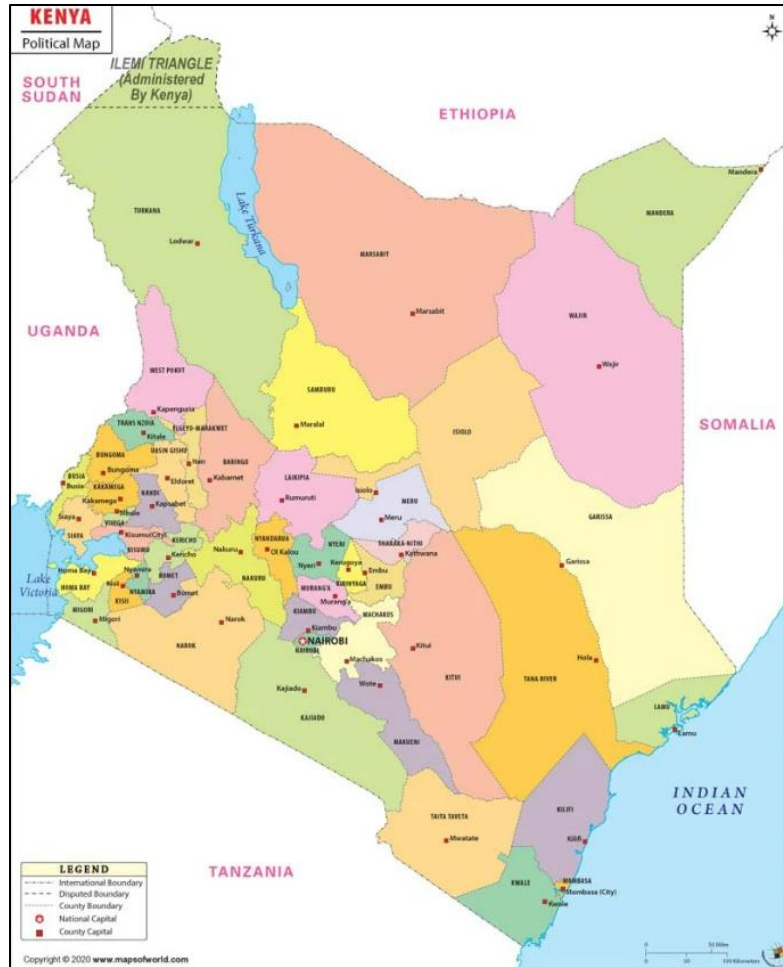


Figure 4: Kenya Map¹⁶

Republic of Kenya is divided into 8 provinces. To facilitate the management, implementation, monitoring and sampling stages of the project, the project proponent divides the project boundary into 4 project areas according to the provinces.

No.	Project Area	Provinces
1	North-Eastern Area	North-Eastern, Coast
2	Central Area	Eastern, Central
3	Rift Valley Area	Rift Valley, Nairobi
4	Western Area	Western, Nyanza

¹⁶ Anon., 2020. Maps of World. [Online] <https://www.mapsofworld.com/kenya/kenya-political-map.html>

The specific project locations with their geodetic coordinates are described below:

S. No.	Name of the project location	Latitude (°)	Longitude (°)
1	Elgeyo-Marakwet	1.04643	35.4839
2	Busia	0.434316	34.2433
3	Siaya	0.062629	34.2878
4	Kakamega	0.282729	34.7519
5	Kisumu	-0.091702	34.768
6	Nandi	0.183365	35.1275
7	Uasin Gishu	0.552702	35.3027
8	Nakuru	-0.303099	36.08
9	Nyeri	-0.437099	36.958
10	Murang	-0.783887	37.0401
11	Kiambu	-1.17481	36.8304
12	Kirinyaga	-0.659025	37.3826
13	Embu	-0.538838	37.4596
14	Tharaka-Nithi	-0.29653	37.7238
15	Kajiado	-1.84207	36.7919
16	Machakos	-1.51768	37.2634
17	Kitui	-1.37508	37.9952
18	Makueni	-2.25587	37.8937
19	Kilifi	-3.0023	39.8167

2.1.8 Baseline Scenario

TSF is used by the majority of Kenyan households in rural areas, as it is in much of Sub-Saharan Africa. Large diameter logs, often obtained from surrounding non-renewable live biomass sources (firewood) located on forest patches or growing on/near farms, are required for controlling an open 'three-stone fire' cookstove utilized by the target population. Demand for large diameter wood for three-stone open fires has increased as population and density have increased, resulting in greater deforestation and land degradation.

Kenya is located in East Africa where it is bordered by South Sudan to the northwest, Ethiopia to the north, Somalia to the east, Uganda to the west, Tanzania to the south, and the Indian Ocean to the southeast. Nairobi is the national capital and the largest city of Kenya¹⁷. According

¹⁷ Kenya Maps & Facts - World Atlas

to the World Bank Data of 2020¹⁸, poverty headcount ratio at \$2.15 a day stands at 35%. With such poverty, its unemployment rate is at 5.6% and the affordability for purchasing consumer goods is affected with an inflation of 5.4%. The personal remittances received in percentage of GDP is 3.6%. The environment is also affected with 0.4 metric tons per capita of CO₂ emissions and a forest area of 6.3% of the total land area surviving. Kenya has 71.5% of its population with access to electricity while its GDP per capita stands at \$1,936.

As per the 2022 Demographic and Health Survey¹⁹, the composition of households in Kenya is such that women head 34% of them and each household has an average member of 3.7. 40% of the total population of Kenya is under 15 years of age. In terms of access to electricity, 90% of the urban households have access to electricity while 36% of the rural households have access to electricity. Overall 58% of total Kenyan households have access to electricity. 24% of the households have access to clean fuels and technologies for cooking which includes stoves/cookers using electricity, LPG/ natural gas/ biogas, solar etc. However, the use of clean fuels in urban areas is substantially higher as against the rural areas (59% versus 6%). In education and literacy, 91% of women are literate while 94% men are literate in Kenya. Overall, 77% of married women and 93% of married men who were employed in the last 12 months earned cash, while the proportion of women who were not paid for their work is almost 5 times higher than that of men (19% versus 4%). In Kenya, 33% of women and 45% of men own a house either alone or jointly. 27% of women and 34% of men own land either alone or jointly. About 4 in 5 women and men own a mobile phone, while 43% of women and 49% of men own a smartphone. 29% of women and 39% of men have and use a bank account. More than 8 in 10 married women participate in decisions about their own health care, 78% participate in decisions about making major household purchases, and 82% participate in decisions about visiting their own family or relatives.

2.1.9 Causal Chain(s)

See appendix A for the Causal Chain image.

2.1.10 Threats to the Project

The potential threats to the proposed project can be classified under two categories, i.e., human induced threats and nature induced threats. This section describes the potential threats and the corresponding approach that will be adopted by the PP to mitigate these threats for ensuring smooth implementation of the project activity.

Human-Induced Threats

Threat: Stove users' lack of upkeep of stove resulting in either malfunctioning of the stove as designed or lack of stove use.

Solution: CQC conducts routine spot audits early in the process of construction of stoves in each main geographic focus for mass stove installation to detect defects in stove construction,

¹⁸ [Kenya | Data \(worldbank.org\)](https://data.worldbank.org/)

¹⁹ [Kenya 2022 Demographic and Health Survey - Summary Report \[SR277\] \(dhsprogram.com\)](https://dhsprogram.com/)

maintenance, and sub-optimal stove use. CQC requires its Implementing Partners (IPs) to hire, train, and supervise stove builders and users, to visit each household to inspect their stoves, up to 2 times per year. This dramatically reduces the threat listed above. Additionally, CQC contracts independent third-party auditors or local CQC staff to perform spot checks or sample size reviews to identify lapses in stove upkeep. Upon receiving these reports CQC contracts sub-proponents to perform follow-up visits to households to provide additional education and encourage stove upkeep and use.

Where metal parts of ICS's commonly found on the market are made of low-grade steel, CQC has upgraded the metal parts for the TLCRS to higher-grade heat resistant steels having a lifespan of a minimum of 10 years, determined by extensive stress testing by Colorado State University, USA. Metal parts include a fuel shelf that doubles as a brick mould, pot skirt, and stovetop.

Threat: Failure of Behaviour Change resulting in high levels of non-adoption

Solution: CQC continuously researches the impacts of behaviour change for successful adoption. Study outcomes, whether formal or informal, are included in future training and community sensitizations to continue to positively, shape knowledge, enhance positive peer-to-peer influence, and increase women's sense of empowerment feeding into social cognitive theory on identity and self-belief. Non-adopters and non-implementors are specifically engaged to understand the barriers to success, these outcomes and conclusions are included in future training, and disinformation is countered through community sensitization.

Threat: Carbon-financed stove distribution is not shown to have an increased impact on household uptake.

Solution: The co-benefits like time savings and increased health benefits (decreases in acute respiratory illness for mothers and children, decreased morbidity/mortality from HAP, and increased nutrition status through retention of nutrients due to decreased cook times) aligned with the adoption of ICS work as prominent incentives for increased uptake of these stoves. The training conducted by CQC highlights that even though CQCs ICS is provided at subsidized rates, yet factors like time savings, health benefits, previous users reasons for adoption (cleanliness of pots, increased social standing, appearance, safety, less smoke), etc. are more important in large scale adoption. Furthermore, awareness of these impacts of cooking using ICS is used to counter this threat.

Threat: Envisaged lobbying by fuel vendors to restrict communities from switching to project cookstoves as they might experience a loss in their income levels

Solution: This threat is not of practical significance, ~56% of rural population in Kenya relied on wood fuel as primary source of cooking fuel²⁰. With the majority of people depending on wood for cooking it is unlikely that the reduction in demand for wood within project boundary would greatly impact the stakeholders involved in selling wood. So, any reduction in demand for wood

²⁰ Waswa, F., Mcharo, M. and Mworio, M., 2020. Declining wood fuel and implications for household cooking and diets in tigania Sub-county Kenya. Scientific African, 8, p.e00417.

fuel within project boundary will shift the stakeholders selling wood to outside project boundary, without causing significant reduction in their business as there would still exist a considerable demand for the product.

Nature-Induced Threats

Threat: Climate Crisis induced displacement/migration (shock-related drought or flood) causing households to change location

Solution: Although the ICS installed under the project are fixed type of stoves, however, the main body which consists of bricks made of commonly found local elements (5L each of clay, sand, dung, and water) can be easily reconstructed whereas the steel parts can be easily removed and used again in newly constructed stoves. This technology can travel easily with the household in their migration and can be rebuilt at a new location using the steel brick mould which is provided to each end user at the time of stove installation. The end user is also provided with the knowledge and requisite training on construction of the bricks as well as stove assembly should the need arise for them to reconstruct the stoves.

Threat: Continued deforestation and degradation making firewood an untenable source of biomass.

Solution: Although increased scarcity would support the use of the TLCRS, there is the potential that as the population continues to expand, particularly on the African Continent, there may be a point when firewood becomes an untenable source. Although access to modern fuels may not be physically or financially accessible to ICS households in the future, creating more dependence on biomass cooking. CQC trains on the use of small branches and twigs and use of crop residues such as maize cobs to ensure a close-to-home source of regenerative biomass. Where possible, CQC will advocate for policy changes and the inclusion of regenerative forestry in governments' low-carbon action plans to support forest protection and regenerative woodlots for sustainable consumption.

2.1.11 Benefit Permanence

CQC envisages bringing about a behavioral change in the community where the project is implemented. The project is a social intervention by which a community is shifted to cleaner cooking practice envisaged through sustained use of improved cookstoves. CQC aims to have permanent benefits for the end users and other stakeholders even after the project ends its crediting period. The interventions planned to achieve this are discussed in the table below:

Activities planned for benefit permanence	Intended outcomes
Associating the project under the	Ensure sustenance of project through carbon credits at least throughout the project lifetime.

GHG mechanism, i.e., VCS and SD VISta	
Stove design complementing cooking needs of target communities	The project stove is designed by keeping in mind the cooking needs of end-users, thereby ensuring that they do not have to make any changes in their daily cooking practices after shifting to project stoves. This ensures easy adjustment with the new technology.
Provision of improved cookstove free of cost	Incentivize the community members to shift to improved cookstoves
Provision of secondary stove in every household	<ul style="list-style-type: none"> i. Encourage supplementary cooking on improved cookstoves. ii. Provision of improved cookstoves that can cater to all the cooking needs, thereby prohibiting the end-users to shift to traditional cookstoves. iii. Inducing habit change among end-users that encourages them to only use ICS
Self-sustainable cookstove design complementing cooking requirements of targeted communities	TLCRS is constructed using sustainable material like clay, mud and bricks which are readily available and allow the end-users to independently repair and sustain the stoves beyond project lifetime
Technical trainings to IPs and ground staff	CQC also provides technical training to the IPs and local staff to ensure effective implementation of the project and minimizing non-adoption. This also includes knowledge dissemination regarding the benefits and co-benefits aligned with the adoption of ICS.
Awareness generation and training sessions for stove usage	<ul style="list-style-type: none"> i. Instilling a positive mindset towards ICS usage among end-users and local communities through information dissemination regarding benefits and co-benefits associated with project stove usage ii. Provision of technical trainings related to stove construction and maintenance. This ensures that project stoves become user-friendly, and the end-users find it convenient and easier to cook over project stoves
Spot checks	To guarantee this, Implementation and Spot Audit teams will be hired to conduct year-round audits. These teams will be provided with transportation facilities to undertake regular inspections. Transportation provided includes bicycles, motorbikes, or motor vehicles, depending on the position. The allocated bicycles remain with staff members contributing to year-round physical mobility that reduces time spent traveling by foot, increases access to local markets to sell income-generating products, and provides reliable

	access to local health facilities; overall, acting as a catalyst for upward economic well-being. This is one of the means to ensure long-term commitment and sustained usage of project stoves.
Grievance Redressal Mechanism	Continuous redressal of challenges associated with distributed cookstoves, or any other concern associated with the project activity to impart trust and belongingness among the beneficiaries.

2.2 Stakeholder Engagement

2.2.1 Stakeholder Identification

A Three-step approach is adopted by CQC for identifying the relevant stakeholders associated with the project throughout its lifetime. The following figure describes the approach adopted for stakeholder identification:

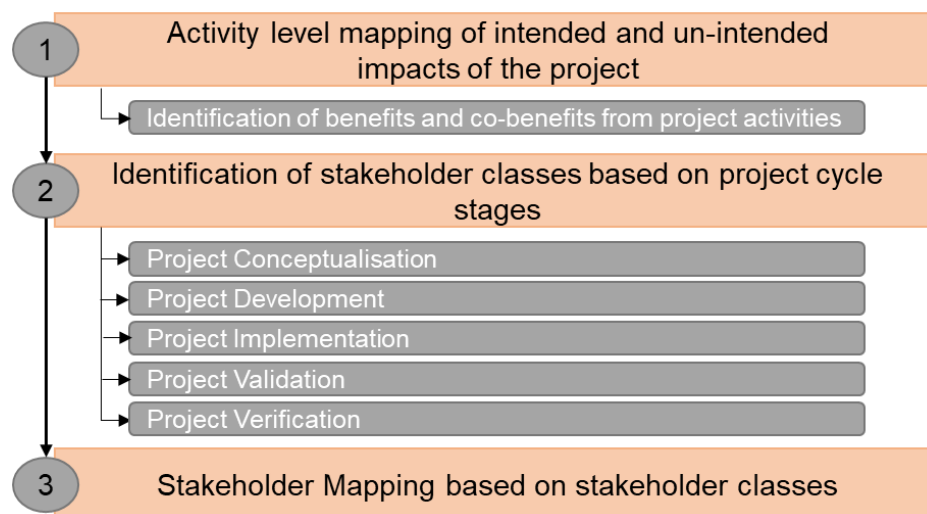


Figure 5: Stakeholder's identification process

The first step involves developing a logic framework model for the designed project to identify activities based on intended and un-intended impacts associated with the project activities. This step will include the identification of benefits and co-benefits aligned with the project activity to identify the potential stakeholders associated at different stages of the project cycle.

After developing a holistic outlook about the overall benefits and co-benefits of the project; stage level stakeholder group identification is undertaken. The different stages considered for stakeholder identification are:

- Project conceptualization- stakeholders would include self-help groups, academia, community representatives who can help the project promoter make ingress within the community etc.
- Project Development- government representatives, community development groups, investors, employable youth, NGOs working in similar sectors etc. would be the stakeholders at this stage.

- Project implementation- end-users, implementing partners, stove part manufacturers etc. would comprise the stakeholders during implementation.
- Project monitoring- surveyors, database developers etc could be some of the main stakeholders during project monitoring.

At the end of the second step, different groups of stakeholders affected during different stages of project development will be identified.

For the convenience of engaging different stakeholder groups and obtaining their response, CQC generally identifies stakeholders under two broad classes: directly affected parties and indirectly affected parties. A detailed description of these classes is defined in section 2.2.2.

The final step includes stakeholder mapping and identification of representative individuals from each stakeholder class identified in step 2. Focus is kept on identifying stakeholders within each of the following categories: end-users, government organizations, international government agencies, non-governmental organizations, religious aid agencies, academic, current, and potential future implementing partners, stove manufacturers, carbon sector organizations, partner donors, the media, and individuals, and their families. Specific focus is made to include individuals and groups who may be directly or indirectly adversely affected by project activities.

2.2.2 Stakeholder Description

The stakeholders identified through the process described in section 2.2.1 are generally grouped under two broad categories as represented in the figure below:

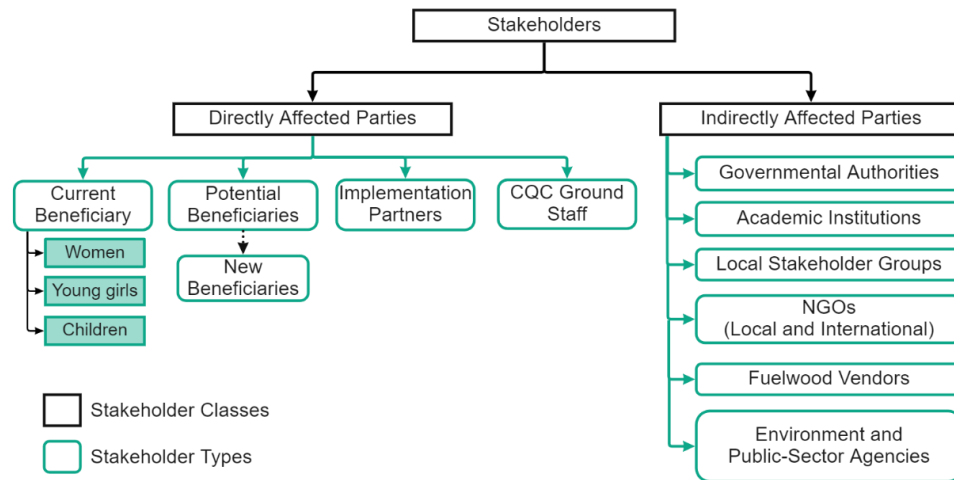


Figure 6: Type of Stakeholders associated with project activity

The stakeholders can be defined as:

Directly affected parties: Directly affected parties can be further sub-divided into 4 categories:

- 1) Current Beneficiary- TLCRS registered users: Women, young children, and elders are identified as individuals who are directly influenced by project activity, primarily women as the cook in the household, who are willing to adopt clean cooking technology. No hierarchy of priority is established to determine who receives an ICS sooner rather than later. Each household demonstrates interest and provides in-kind contributions to build the stove exterior. CQC will provide an ICS to each household in Kenya that expresses the desire to adopt the technology. However, there could be occasional delays between the household's desire to have a stove and its implementation owing to the availability of metal parts or implementing partner workloads, but CQC will ensure that all the households will receive the cookstoves in a stipulated time frame.
- 2) Potential beneficiaries- New Users and potential adopters: Through advertisements, sensitization events, active communication and interaction with community leaders, groups such as Self-Help Groups and community meetings, local partnerships with academia, and government institutions and stakeholder consultation, CQC actively seeks out new beneficiaries.

The current and potential beneficiaries typically share similar characteristics within Kenya as our current target demographics are individuals and households in rural settings, although there are plans to expand into the peri-urban and urban settings to offer the TLCRS to any individual prepared to adopt its technologies. This plan is designed to drastically reduce the need to use the three-stone cookfire. CQC provides all households with a double stove, which consists of two sets of metal parts and two individual brick constructions attached with two bricks at floor level to eliminate the use of the TSF cookstove for cooking.

- 3) Implementation Partner- Organizations in partnership with CQC: IP are the organizations with a local presence, community networks and knowledge of on-ground scenarios which gives them an extra edge in implementing the project. The IP are directly benefited/ impacted by the project through knowledge, skilled employability, and monetary benefits incurred due to project implementation.
- 4) CQC on-ground staff: C-Quest Capital employs local manpower during various stages of project development and implementation to carry out its developmental activities in host countries. These individuals benefit not only from immediate employment in the organization but also through various training programs throughout the project life thereby improving their overall chances of employment.

Indirectly affected parties: Indirectly affected parties can be further sub-divided into 5 categories:

1. Governmental Authorities: CQC and implementing partners engage with local traditional authorities through 'Courtesy Calls' to provide information and gain input on the anticipated projects and the target population. CQC teams gain permission from the local Traditional Authorities, to operate in these areas through these 'Courtesy Calls;'
2. Environment, Health, and public-sector agencies: In-country agencies that work in tandem with CQC's projects through implementation, operate in the same geographical areas, or operate their projects that may touch upon similar sectors as the projects CQC implements.
3. Academic Institutions: CQC is invested in partnerships, providing funds, and welcoming interested academic institutions to study our projects at any level but our particular interest is through direct household-level studies of beneficiaries so that CQC can best understand the impacts, positive and negative, how to magnify the positive and eliminate or reduce the negative impacts. CQC currently has relationships with academic partners at Duke University, Lilongwe University, and Oregon State University, and various contracts through other high-ranking academic institutions.
4. Local and International NGOs: In-country partners that work in tandem with CQC's projects through implementation, operate in the same geographical areas, or operate their projects that may touch upon similar sectors as the projects CQC implements.
5. Others, as applicable and interested: CQC welcomes feedback and interest in our projects from interested sources that may not have been identified in this description. However, CQC reserved the right to act upon feedback and correspond with the party providing feedback to ensure it originates from a constructive source.

2.2.3 Stakeholder Consultation

CQC is committed to continuous consultative approach to ensure that feedback and inputs of all the relevant stakeholders are received and incorporated, as appropriate. Several means of consultation approaches are adopted by CQC throughout the project lifetime at different stages

of project implementation to ensure an inclusive and integrated consultation. It is relevant to highlight that the consultation approach adopted by the PP is:

- Inclusive, i.e., caters to the diversity in different stakeholder groups
- Stakeholder specific, i.e., considers the requirements of different stakeholder groups. For instance, information is disseminated in local language understood by stakeholders.
- Culturally appropriate, i.e., ensures that cultural sensitivity of stakeholder groups is preserved.
- Gender sensitive, i.e., respects all genders.
- Continuous, i.e., conducted regularly throughout the project lifetime.
- Informative, i.e., ensures project specific information dissemination among the related stakeholders. Information related to benefits and co-benefits, potential risks, threats, and cost are provided to the end-users during multiple consultation rounds described below.

The following table provides the stakeholder specific consultation approach adopted by CQC:

Stakeholder Group	Identified Stakeholder (Continuously expanding)	Consultation activities
Directly Affected Parties	Current beneficiaries (Individual, household, and community level)	-Household visits/surveys -Community level sensitization activities -Open communication with IPs and CQC -CQC Local office
	Potential beneficiaries (Individual, household, and community level)	-Household visits/surveys -Community level sensitization activities -Open communication with IPs and CQC -CQC Local office
	Implementing Partners	-Open communication with CQC -Sensitization and awareness generation activities -Vocational trainings
Indirectly Affected Parties	Government authorities	-Public events -Publications and social media communications
	Academic institutions	-Public events -Publications and social media communications
	NGOs (Local and International)	-Public events -Publications and social media communications

	Local stakeholder groups (including fuelwood vendors)	-Public events -Publications and social media communications
	Environment and Public sector agencies	-Public events -Publications and social media communications

Details of stakeholder consultation activities conducted before project initiation:

For the VCS project, CQC underwent a local stakeholder consultation (LSC) process between 26 October-2020 and 25-November-2020, necessary precautions were taken place considering the COVID-19 pandemic, with feedback having been conducted electronically when possible, minimizing large groups and socially distancing during in person meetings.

Stakeholders were invited to the LSC via multiple methods including an announcement posted on C-Quest Capital's website advertisement in The Daily Nation, and e-mail invitations. Email invites were sent from C-Quest Capital to fifty-four (54) stakeholders from organizations around the country including government, NGOs, stove manufacturers, project developers, academia, and private & public-sector entities involved with cookstoves and/or sustainable energy. The email included a link to the CQC website announcement, non-technical summary of the project and feedback form. Stakeholders are encouraged to share their views (positive or negative) with the PP, implementation partner, and with village authorities depending upon their comfort and convenience.

At the national level, thirteen (13) individuals attended stakeholder consultation meetings and provided feedback and another fifteen (15) individuals provided feedback at a beneficiary meeting.

OUTCOME OF LSC: All the participants expressed a need for a large-scale, improved cooking program in Kenya so that it may create a substantial and measurable health, financial, and environmental benefits for the people of their country. The project proponent will take due account of all these inputs received from stakeholders; however, the project design has not been affected by the feedback of the stakeholders.

2.2.4 Continued Consultation and Adaptive Management

Consultation and Adaptive Management will continue throughout the project lifetime as CQC is committed to project evolution to best meet the needs of the beneficiaries and amplify, where possible, the impact of the project activities as they relate to the SDGs. CQC is also committed to additional projects, where feasible, that multiply sustainable development and enhance the empowerment of women, child and household nutrition, health, and economic wellbeing.

The different type of stakeholder consultation approaches planned through the project lifetime are summarized below:

Consultation approach	Target stakeholders	Mode	Information Disseminated/ checked	Knowledge material/ Records	Frequency
Local stakeholder Consultation (LSC)	Directly and Indirectly Affected parties	Physical	i. Project design ii. Socio-economic and cultural benefits & co-benefits iii. Potential risks & costs associated with stakeholder groups iv. SDG benefits associated with project	Presentation deck; Non-technical summary; Feedback forms; and attendance sheets	Before the start date of project
Feedback through website	Directly and Indirectly Affected parties	Virtual feedback (VERRA public comment period)	i. Project design ii. Socio-economic and cultural benefits & co-benefits	Non-technical summary; Feedback form	Before the start date of project (30-day period)
Publications	Directly and Indirectly Affected parties	CQC communication	i. Project overview ii. Project benefits and co-benefits iii. Success stories	Newsletters; Blogs; Social media communications	Continuous (Throughout project lifetime)
Awareness generation and training session for stove usage	End-users (Directly affected party)	Physical	i. Stove construction and maintenance ii. Stove usage	Stove construction brochures; Technical specifications of stove	At the time of stove distribution
Community level	Directly and Indirectly	Physical/ Virtual	i. Project design	Open communication	Continuous

sensitization activity	Affected parties	(Ground staff/IP executes this activity)	ii. Socio-economic and cultural benefits & co-benefits iii. SDG benefits associated with project		(Throughout project lifetime)
M&E Survey	End-users (Directly affected party) through household visits	Physical	i. Stove identification ii. Fuelwood use estimation iii. Stove operability iv. SDG benefits v. General feedback	Survey questionnaire form (F2F interaction)	Annually/ Biennially
Spot checks (Stove champion programs)	End-users (Directly affected party) through household visits	Physical	i. Stove usage ii. Challenges and concerns of end-users	Open communication during household visits	Annually/ Biennially
Grievance Redressal Mechanism	Directly and Indirectly Affected parties	Physical (At CQC office)/ IP/ Helpline Number	Stakeholders can report their feedback, concerns, and challenges through the GRM approach outlined for this project throughout its lifetime	Grievance Register	Continuous (Throughout project lifetime)

1. Local Stakeholder Consultation (LSC): The LSC for the SD VISta process will be executed like that of the VCS process, with additional requirements of the SD VISta continuous engagement of stakeholders. CQC approaches all the identified stakeholders to participate in the LSC wherein details about the following aspects of the project are informed to the stakeholders:

- Project objectives and implementation plan

- Benefits and co-benefits associated with project implementation.
- Potential risks associated at the project and stakeholder level.
- Potential costs associated with project implementation with respect to identified stakeholder groups.
- Feedback and continuous adaptation approach

2. Feedback through website: Non-technical summary of the projects is hosted on CQC websites as well as on VERRA website for review by all the stakeholders. Feedback about the project or any clarifications can be clarified through the website itself.

3. Publications: CQC engages with relevant stakeholders through various publications published on the organization's website. The knowledge material produced by the PP include newsletters; blogs; social media communications etc. which is available in public domain and provides comprehensive information about the project.

4. Awareness generation and training session for stove usage: Proper training regarding stove construction, stove usage and maintenance is provided to the end-users at the time of stove distribution. Hands-on training program is conducted through which the ground staff demonstrates the stove construction process and takes feedback from the end-users.

5. Community level sensitization activities: During the initial community sensitization and training by Implementing Partners, the benefits of the project are detailed to community members. Educational materials (brochures) are distributed to potential beneficiaries. Multiple channels of open communication are available with the stakeholders to connect with the IP or CQC.

6. M&E surveys: Periodic monitoring and evaluation (M&E) surveys are conducted by CQC to understand the ground realities of the project and stove usage scenario at the project location. It is conducted on a regular basis depending upon the monitoring cycle of the project and captures information related to project sustainability and achieved SDG benefits.

7. Ground-staff spot check visits: CQC Implementing Partners engage with beneficiaries and their families several times over the year through household visits. During these visits, education and maintenance are consistently reinforced to the household, with hands-on technical assistance, if necessary.

8. Grievance Redressal mechanism (GRM): CQC has developed a proper mechanism to address the grievances faced by the stakeholders. A three-channel mechanism is developed as a part of the GRM allowing continuous interaction between PP and stakeholders.

2.2.5 Anti-Discrimination

CQC is committed to providing the best possible climate for maximum development and goal achievement for all its employees and contractors. CQC believes that discrimination in all its forms (gender, race, religion, sexual orientation, or other habits) and sexual harassment and assault have no place within the development sector and more specifically at CQC, our implementing partners, our employees, contractors, and third-party individuals, and within the projects we design, fund, and execute. Specifically, our project activities are designed to reduce or eliminate, where culturally possible, discrimination, sexual harassment, and sexual assault where it exists within the societies where we work.

CQC supports diversity, inclusion, and equity with attention to vulnerable populations, including women and female children. CQC prohibits any form of discrimination, harassment, or assault, all being grounds for dismissal of employment, termination of the contract, an immediate discreet investigation of the reported incident, and where warranted, reports to the applicable authorities. Detailed description of these policies is presented in the employee handbook of CQC which is provided to every individual at the time of employment to make them aware about the provisions for their welfare within the organization. Similarly, while appointing IPs under any specific project, CQC provides formal training to third parties/IPs to maintain same policies with their employees who will be working on CQC projects.

CQC abides by the labor laws in the countries where we operate and contract individuals, the project proponent, and implementing partners welcome any beneficiary who requests our project services and is committed to the stated terms and conditions of project participation.

2.2.6 Worker Training

CQC understands that a new job is exciting and at times can be overwhelming. CQC has teams worldwide, U.S.A., Australia, India, Malaysia, and in-country teams in locations where our projects are implemented. CQC and its affiliates understand the importance of employee and contractor contribution and providing the finest quality services to our clients, our reputation and continued expansion of benefits depend on client satisfaction which is connected to our employees and contractors.

CQC provides a detailed employee handbook to its employees, with details such as (i) the way CQC works, (ii) pay and progress, (iii) time away from work and other benefits, (iv) on the job conduct, (v) data security, (vi) safety in the workplace, (vii) anticorruption, antibribery, and anti-terrorism procedures, among other elements.

Independent Contractors are contracted through CQC, and the contract reflects the workers have trained in the U.S.A. anticorruption laws before the start of their employment and contracting. CQC provides training to country managers and other team managers, as appropriate, once these individuals are trained, they are responsible for providing standardized and regularly revised training and guidance to the teams they oversee and are trained by CQC in a train-the-trainer model. The contractors are also responsible for providing training to the household's primary cooks in construction, maintenance, and best practices in using the TLCRS before the registration of the stove.

The training provided by CQC to independent contractors is a comprehensive two-day session comprising both classroom and on-the-ground components. On the first day, participants cover program review, CQC information, training purpose, expectations, roles, basics of climate change, traditional fire impacts, heat science, stove details, project registration, and its verification. Day two focuses on travel logistics, group stove construction, maintenance discussions, smaller group stove building, and a wrap-up session.

Training materials are in flux as CQC makes edits to the stove design or other identified areas where the training needs to be redesigned.

Topics cover all the benefits and co benefits of stove adoption align with SDGs empowering implementers to make informed decisions. The initial classroom session includes stove construction demonstration via PowerPoint, followed by direct village training on day two, fostering local skills and knowledge. The coverage and hands-on training build locally useful skills and knowledge to increase local participation in project implementation. These trained trainers go on to provide sensitization campaigns and training for each beneficiary, so the benefits are amplified.

Furthermore, CQC provides training in the local language keeping into consideration the marginalized and vulnerable communities who may not be equipped with the English language. Also, PP ensures that a local representative is always present throughout the training sessions to minimize communication gap *to make the local people comfortable. This ensures improve interaction between end users and PP as end-users feel free to discuss their queries and concerns about the project.*

2.2.7 Equal Work Opportunities

CQC makes every effort to abide by the laws and regulations of the countries it operates in, as well as US law, and international statutes, as applicable. When conducting recruitment, CQC prioritizes hiring local community members and offers new opportunities to project beneficiaries as CQC expands operations and job openings arise.

This priority demonstrates CQC's reverence for the deep understanding of cultural nuances that only local community members could hold and this quality in addition to the ability to take initiative and work independently are primary qualifications CQC seeks in candidates. CQC also seeks to mirror the percentage of women/men in the country in its in-country workforce, making all efforts to hire women candidates for all levels of positions.

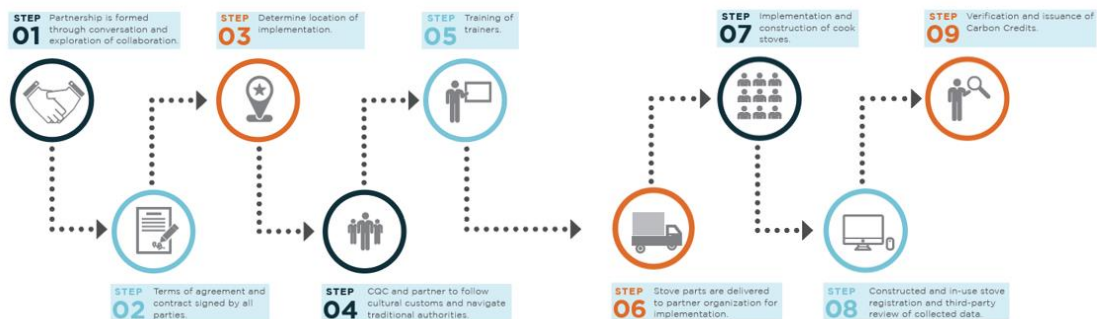


Figure 7: Steps of Project Cycle that include identification of equal work opportunities, partnerships, and training

CQC has adopted several measures to ensure that members of local communities, including women, and marginalized and/or vulnerable communities receive fair opportunities to fill positions for which they can be trained. Following are the measures:

1. Uniform dissemination of information – CQC ensures uniform dissemination of information through various means such as advertisements in its website or through social media. Same

information is accessible to all the people irrespective of their socio-economic and cultural backgrounds and gender.

2. Fair Employment Practice Policy – CQC has fair employment practice policy in place that prevents discrimination against anyone based on individual’s race, gender, age, disability, ethnicity or cultural affiliation, sexual orientation, belief, educational background, or any other basis. This includes any work-related decisions (e.g., hiring, promotions, or terminations).

3. Appropriate Pay and Benefits – CQC provides fair and appropriate pay and benefits that match local living wages. It provides a safe and inclusive environment, empowering women to ensure their full engagement in decision-making processes and other roles in the organization.

4. Unbiased Interview – CQC conducts fair interviews in which recruitment is made solely on the capability of the candidate in an unbiased manner irrespective of gender, caste, creed, socio-economic and cultural backgrounds.

5. Job nature – In case the nature of job is such that it requires extensive operational work, male candidates are preferred over female as CQC is sensitive about safety, security, and all other aspects of females.

2.2.8 Workers' Rights

The contractor, synonymous with implementing partner, enters into an independent contractor agreement with CQC. The agreement contains details of CQC’s and the contractor’s compliance with laws including, national, sub-national, state, and local, as well as policies, laws, rules, and regulations, including the United States Foreign Corrupt Practices Act. Specific information is provided on anti-terrorism and anti-corruption efforts, including a code of conduct.

Per the Core Labour Conventions of the International Labour Organization (ILO), CQC, respects, and works in tandem with the elimination of all forms of forced or compulsory labour, the effective abolition of child labour, minimum age convention, the right to organize, and the elimination of discrimination in respect of paid positions and occupation. CQC prohibits any kind of harassment and discrimination of any employee and follows labour laws of the country.

At the time of onboarding, CQC provides the Employee’s Handbook containing details about the worker’s rights under all relevant laws and policies. Every individual working with CQC, irrespective of their position, are required to duly sign and agree to the policies and information provided in the handbook. This ensures that every individual is aware about their rights and duties while being associated with CQC. Furthermore, if CQC collaborates with a third party to supplement any of the implementation activities of the project, then the contracted agencies are well-informed about the mandate requirements of CQC Handbook. By adhering to these established guidelines, CQC ensures worker protection throughout the entire project implementation process.

2.2.9 Occupational Safety Assessment

To mitigate the rare yet potential occupational safety hazards, CQC makes every effort to contract workers who have lived in the community for several years, this assists in mitigating the occupational hazards through community familiarity, language fluency, and native to the culture. This understanding of traditional values, respect, and working environment in the communities CQC serves support reduction of safety hazards. CQC provides Group Personal Accident insurance to our office staff.

Occupational Safety Hazards that have been identified are transport-related accidents, theft of parts, corruption, and jealousy of CQC contractors by their community counterparts. Transport-related accidents involve a vehicle, motorbike, and bicycle accidents. CQC provides these modes of transportation to their contracts where necessary. Ultimately, the infrastructure conditions, whether through road constructions or road disturbances (loose animals, poor weather, i.e., rain) cause hazards that are not specific only to CQC but a hazard existing country wide. Other hazards include theft of parts which has been mitigated by the collection of parts by a health promoter.

Risks are assessed and mitigated where possible and workers, stakeholders, and others directly involved with the projects are made aware of the potential risks and opportunities to mitigate where possible, yet it should be noted that employment or use of the stove does not increase the safety risks that are already present in the landscape of the country.

2.2.10 Feedback and Grievance Redress Procedure

CQC's Feedback and Grievance Redress Policy and Procedure ensures that project-affected communities and individual grievances are properly prioritized and addressed. These measures are taken to enhance CQC's accountability and transparency and to support the project initiatives that can help the communities to identify adverse effects to them, or their environment which had not previously been identified and mitigated by CQC. The full grievance redress policy and the procedure is available upon request and represented in the figure below:

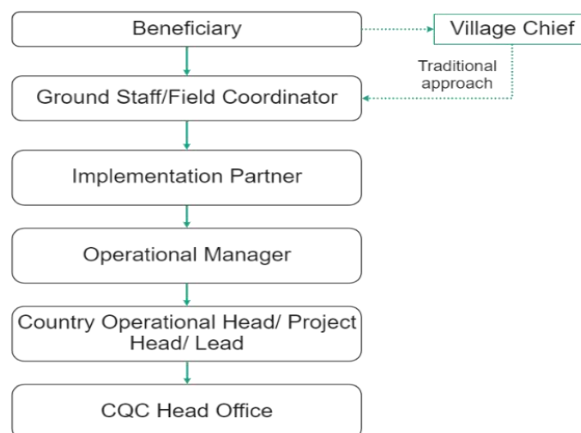


Figure 8: Grievance Redressal Mechanism

The first step of a complaint is typically applied to the informal procedure, where the affected person discusses the identified issue or provides feedback to the Field Coordinator or another member of the management team. In case the end-users are not very comfortable in approaching CQC team directly, a provision is made for them to approach us through their village chief. The village chief then reports the concerns to the concerned person, i.e., field staff from CQC who takes it further and resolves the issue. This is undertaken to protect the traditional sentiments and value system of the villages and help them express their issues without any hesitation. The Field Coordinator attempts to resolve the grievance immediately on an informal basis, seeking advice from other parties (Area Development Committee, etc.) where necessary. The Field Coordinator and affected person work together as immediately as possible, to solve the identified issue. This informal procedure does not prevent an individual or community from making a formal complaint process at any time.

The formal process requires the grievance to be filled in a written form, with the form available at the TA's office and collected by the CQC Field Coordinator. If literacy is a barrier, or other barriers exist such as distance to the TA's office, a telephone call to the CQC Direct office in Lilongwe is recommended where the grievance is recorded in written form by a staff member at the office. The CQC Direct office number is available to all project beneficiaries on brochures and posters provided at registration and during community sensitization. All grievances are to be assessed and an update is provided to the grievant within 10 days. Three options for procedure guide CQC Direct's response (a) resolution is offered immediately according to the request made by the grievant; (b) resolution is more complex and requires additional consideration or extraordinary resources will lead to the grievant invited to a meeting to discuss options; and (c) where the complaint cannot be resolved through a meeting an investigation is arranged within 1 week (7 days) to gather additional information, led by the Field Coordinator, followed by a grievance hearing within 10 working days of the completed investigation.

Formal grievances are recorded in summary and shared with CQC to identify if the complaint is a project-wide issue that necessitates a system change in implementation.

2.2.11 Feedback and Grievance Redress Procedure Accessibility

The CQC Grievance Policy and Procedure is accessible as a phone number of the CQC office in Lilongwe is available on the brochure provided to each household, which is the most accessible manner to provide feedback. CQC policy and procedure outline the process to evaluate and respond to complaints; the procedure details when a serious level complaint should be communicated to CQC country teams and when it would be best addressed by the implementing partner. Additionally, the grievance policy and procedure are verbally described during courtesy calls to TA's and the Area Development Committee (ADC).

2.2.12 Stakeholder Access to Project Documentation

A hard copy of all the project related documents is maintained with CQC IPs and central office in the host country which is accessible to all the stakeholders associated with the project, especially end-users. Considering that the project documents are very technical and will be difficult for the

end-users to comprehend, a non-technical summary detailing the project activities and its outcomes is also available with IPs as well as central office in the host country. During the distribution of the project stoves, enhanced focus is laid on verbally communicating the information about accessibility of project documents among CQC implementing partners, staff, and local community members. In addition to verbal communications, a dedicated helpline number is provided to the end-users through which they can contact the IPs or CQC ground staff to access the project documents. Further, CQC also posts these reference documents on its website offering open access to all the stakeholders. An effort is also made to ensure that end-users understand the process of accessing these documents on the website by providing them verbal communication as well as a flyer with pictorial representation of the steps to access this documentation. Efforts are made to publish links to these materials across CQC's social media footprint.

2.2.13 Information to Stakeholders on Assessment Process

CQC informs the beneficiaries and their families that they are participating in a project that distributes the TCLRS improved cookstove at an in-kind donation (labor and bricks constructed from locally available resources) to improve their respiratory health, food security, family economy through reduced cost of firewood and times saving, and the environment. We also inform them of our need to track their successes and monitor key data, such as money spent on wood fuel and/or time spent collecting wood fuel, among other indicators. As CQC is committed to cultural integrity but must ensure the integrity of the project and programs, auditors, and stove champions visit the families up to 2 times after implementation.

As the SD VISta program progresses, the main forms of communication to stakeholders will be through stove champions, social media, and the CQC website. We will announce our participation through training, community sensitization programs, social media, public releases, and our website.

The identified stakeholders will be provided with an intimation that VVB site visit is expected to be conducted in their project location. This is generally provided at least 1 month prior to VVB site visit (21 working days is also generally accepted). A stakeholder specific and relevant mode of communication is adopted to provide the information to identified groups as summarised in Table 3.

Table 3: Mode of communication for stakeholder groups

Stakeholder Type	Mode of communication
End-user	Hard copy intimation letters to be provided to end-users (especially the HHs to be visited for VVB audit) Photographs to be collected while distributing initiation letters as a proof
Local Government Officials	Emails Personal visit
NGOs and other	Emails Personal visit

Village Chief	Hard copy intimation letters to be provided to end-users (especially the HHs to be visited for VVB audit) Photographs to be collected while distributing initiation letters as a proof
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2.3 Project Management

2.3.1 Avoidance of Corruption

CQC and/or its affiliates and subsidiaries, as the primary project proponent, and those entities contracted as implementing partners, are committed to combating any form of corruption, bribery, embezzlement, fraud, favouritism, cronyism, nepotism, extortion, and collusion. CQC's employees sign a code of business ethics and conduct form provided to them in the Employee's handbook that mandates performance of all duties with honesty, integrity, and impartiality, without improper preferential treatment of any person, and undergo mandatory anti-corruption and antibribery training as a condition of employment. CQC's implementation partners are required to review CQC's anti-corruption and anti-bribery policies and must take anticorruption and antibribery training before performing any project implementation services as a condition of their contract.

2.3.2 Statutory and Customary Rights

CQC operates from private homes, enhancing remote employment capabilities, and a central office location in Washington, D.C. U.S.A. Community sensitizations and training take place either on public land, i.e., a central town meeting point, or on private property with the explicit verbal invitation of the homeowner. The CQC implementing partners enter the kitchen space of the household to install the TLCRSs only with the explicit permission of the household. Stove installations take place within rural areas of Kenya, and for the most part exclude the urban and peri-urban settings, although other projects will focus on these geographical areas in the future. CQC and its implementing partners take active consideration of individual and collective rights to ensure all rights are respected.

2.3.3 Recognition of Property Rights

CQC's implementing partners only install a stove at the informed invitation of the household and CQC's ICS does not infringe or interact with property rights.

2.3.4 Free, Prior and Informed Consent

The project activities will take place with the approval of Village Development Committees and Area Development Committees in a series of consultation meetings as documented. In addition, ICS is a completely voluntary activity and households in participating villages are free to choose whether they take part or not. Free, prior, and informed consent takes place before installation.

2.3.5 Restitution and/or Compensation for Affected Resources

CQC's installation of an ICS does not affect any party's access to resources or their lands; no negative effects have been identified.

2.3.6 Property Rights Removal/Relocation of Property Rights Holders

CQC's ICS installation does not impede, involuntarily remove, or relate the land or property rights of the beneficiaries or their families. ICS installation incentivizes the beneficiaries to end the use of three-stone fires and use project stoves for cooking activities. While this may change the cooking activity practices to some extent, post-implementation surveys of beneficiaries suggest that the ICS allows them to decrease cooking times while making identical food items as with three-stone fires. This is seen as clean technology adoption and not an infringement of important cultural activities.

The project activities do not involve the removal or relocation of property rights holders from lands or territories, nor do they force rights holders to relocate activities.

2.3.7 Identification of Illegal Activities

Theft and corruption are commonly identified as illegal activities in Kenya. As there is no transfer of funds at the beneficiary level CQC expects to eliminate the cause of corruption. Theft of metal stove parts has occurred in the past and CQC has since implemented secure storage and direct hand-off of stove parts to reduce this occurrence.

2.3.8 Ongoing Conflicts or Disputes

There are no identified ongoing conflicts or disputes as the project scope does not involve rights to lands, territories, and resources. As the project implementation takes place within the private household, project activities would not interfere with the outcome of an unresolved dispute.

2.3.9 National and Local Laws and Regulations

Kenya has several national labour laws and regulations to ensure that the country provides a conducive environment for the local people to work for their livelihoods. The major labour laws in Kenya include:

- **Employment Act²¹:** This act governs the relationship between employers and employees. It provides a basis on which minimum conditions of employment such as wage protection, rights and duties in employment, termination and dismissal etc. are set, in order to create a healthy atmosphere to work and progress for both the employers and the employees;
- **Labour Relations Act²²:** It guarantees right to freedom of association to the employees, establishes and registers trade unions and other employer's organizations, facilitates collective bargaining and provides the means to resolve disputes;
- **Labour Institutions Act²³:** It enables creation of labour institutions in the country such as the national labour board, the industrial court, a committee of inquiry, labour administration and inspection, a wages council, employment agencies and miscellaneous provisions;

²¹ [Kenya's Employment Act, 2007](#)

²² [Kenya's Labour Relations Act, 2007](#)

²³ [Kenya's Labour Institutions Act, 2007](#)

- **Work Injury Benefits Act²⁴**: This act provides the means to workers to receive benefits and necessary compensation for work-related injuries. It states the obligations of employers, the right to compensation, reporting of accidents, occupational diseases, medical aid, and miscellaneous provisions;
- **Occupational Health and Safety Act²⁵**: It regulates the workplace for health and safety of the employees. It states the 'General Duties' which includes duties of the occupiers, self-employed persons, employees etc., the 'Administration', the 'Enforcement of the Act', 'Registration of workplaces' etc.

In addition, Kenya is also a member state of the International Labor Organization (ILO) and has ratified several ILO Conventions²⁶. The 'Fundamental Conventions' ratified by Kenya are:

- **Forced Labour Convention, 1930 (No. 29)²⁷**: Article 2 of the convention defines forced labour as "all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily." The Forced Labour Convention aims to counteract the use of forced labour independent of the sector or type of work and is part of the eight fundamental ILO conventions for the protection of labour rights²⁸;
- **Right to Organize and Collective Bargaining Convention, 1949 (No. 98)²⁹**: This Convention provides worker's organisations and employer's organisations with the right to self-determination and the right to form and join federations. It further provides for protection of organisations from state interference and embodies the principle of free and voluntary negotiations;
- **Equal Remuneration Convention, 1951 (No. 100)³⁰**: The Convention focuses on gender discrimination in employment and outlines principles for the equal remuneration for work of equal value independent of whether it is performed by men or women;
- **Abolition of Forced Labour Convention, 1957 (No. 105)³¹**: This convention provides for the complete abolition of certain forms of forced or compulsory labour constituting a violation of the rights of man referred to in the Charter of the United Nations and enunciated by the Universal Declaration of Human Rights;
- **Discrimination (Employment and Occupation) Convention, 1958 (No. 111)³²**: It is an anti-discrimination convention which addresses discrimination based on race, sex, political opinion, or religion. It is one of eight fundamental ILO conventions on the protection of labour standards³³;
- **Minimum Age Convention, 1973 (No. 138)³⁴**: The aim of the convention is the effective abolition of child labour by requiring countries to: 1) establish a minimum age for entry into work or employment, and 2) establish national policies for the elimination of child labour³⁵; and

²⁴ [Kenya's Work Injury Benefits Act, 2007](#)

²⁵ [Kenya's Occupational Health and Safety Act, 2007](#)

²⁶ [Ratifications by Kenya | ILO](#)

²⁷ [Forced Labour Convention, 1930 \(No. 29\) | OHCHR](#)

²⁸ [Convention - Forced Labour Convention, 1930 \(No. 29\) \(gsphub.eu\)](#)

²⁹ [Right to Organise and Collective Bargaining Convention, 1949 \(No. 98\) | ILO](#)

³⁰ [Equal Remuneration Convention, 1951 \(No. 100\) \(ilo.org\)](#)

³¹ [Convention C105 - Abolition of Forced Labour Convention, 1957 \(No. 105\) \(ilo.org\)](#)

³² [Discrimination \(Employment and Occupation\) Convention, 1958 \(No. 111\) \(ilo.org\)](#)

³³ [Convention - Discrimination \(Employment and Occupation\) Convention, 1958 \(No. 111\) \(gsphub.eu\)](#)

³⁴ [Convention C138 - Minimum Age Convention, 1973 \(No. 138\) \(ilo.org\)](#)

³⁵ [ILO Conventions on child labour \(IPEC\)](#)

- **Worst Forms of Child Labour Convention, 1999 (No. 182)**³⁶: This convention requires countries to take immediate, effective and time-bound measures to eliminate the worst forms of child labour as a matter of urgency³⁷.

Besides the labour laws, Kenya's main environmental regulating statute is the Environmental Management and Coordination Act (EMCA)³⁸. The law contains general requirements that apply to all environmental sectors and all public and private acts that may have an impact on the environment³⁹. The legal framework for environmental management and governance in Kenya includes the Constitution of Kenya (2010), the EMCA (1999), and other laws.

CQC as an organization in the capacity of a project proponent abides and adheres to all the laws mentioned above in the execution of its projects relating to cookstoves in the Republic of Kenya. Further, CQC also ensures that the third-party vendors, including the implementing partners associated with the project activity are registered with appropriate national authorities which allow them to conduct their operations within the project location.

2.3.10 Project Ownership

Beneficiaries agree to allow CQC to do the following:

- (1) Claim the GHG emission reduction and/or removals generated by the technology used by the CC ICS project.
- (2) Conduct follow-up and spot audits for increased adoption and monitoring purposes.

The stoves themselves are owned by the beneficiaries with in-kind contributions, including making and constructing the bricks for the construction of the TLC Rocket Stove.

2.3.11 Grouped Projects

With CQC's group projects, secondary projects are identified through stakeholder assessment and development initiatives at the community level that we can meet. New project activities are assessed and evaluated to determine if they provide significant individual impacts (funding of education), household (cookstove), or community level (training on climate change). Following, new project activities are evaluated against current projects in their thematic buckets to determine if CQC and IPs have the bandwidth to take on additional projects. If acceptable, pilot projects on a small scale may begin to evaluate the implementation and identify necessary changes. CQC remains committed to being flexible with the addition of new projects so long as current projects continue their projected timelines and anticipated impact and benefit to the beneficiaries.

For the inclusion of new project activity instances i.e., ICS, the project proponent shall ensure that it meets the eligibility criteria below – per Appendix 1 – Grouped Projects (GP) of the SD VISta Standard.

³⁶ [Convention C182 - Worst Forms of Child Labour Convention, 1999 \(No. 182\) \(ilo.org\)](#)

³⁷ [ILO Conventions on child labour \(IPEC\)](#)

³⁸ [Kenya's Environmental Management and Coordination Act, 1999 | E-Regulations Kenya Govt.](#)

³⁹ [Enforcing the right to clean and healthy environment in Kenya through the polluter pays principle by Kariuki Muigua | February-2023 | Kariuki Muigua & Co Advocates](#)

S No.	Criterion	How the new project activity instances to comply
1	Adopt and implement the project activities in the same manner as specified in the project description.	New project activity instances will be implemented in the same manner as described in the project description and will be implemented directly with beneficiaries of the TLCRS (TLC Rocket Stove), extending benefits and reinforcing project stove adoption
2	Where appropriate, meet the applicability conditions of the SD VISta asset methodology applied to a project.	The project activity as well as the new project instances do not apply for SD VISta assets and hence this criterion is not applicable
3	Are subject to the same scenarios at project start with respect to stakeholders' well-being as determined for initial project instance(s), where (per Section 2.1.5.2 above) the project must meet the criteria of Section 3.1 above	New project activity instances will have the same baseline scenario, which was available during the start of project, i.e., usage of TSF cookstoves in the households. Also, the instances will be designed to maximize intended impact and preserve well-being, with monitoring and ongoing stakeholder consultations to ensure impact,
4	Are subject to the same scenarios at project start with respect to natural capital and ecosystem services as determined for initial project instance(s) where (per Section 2.1.5.2 above) projects must meet the criteria of Section 3.2 above.	New project instances will have the same scenario w.r.t natural capital and ecosystem services as determined in the baseline scenario. All the new instances will also have households relying on wood fuels for meeting their daily cooking energy demands.
5	Are subject to the same processes for stakeholder engagement described in the project description	The new project activity instances will be detailed during continuous stakeholder consultations, refresher trainings for Implementing Partners and feedback consider in secondary project activity design to maximize intended impact and preserve well-being.

6	Are subject to the same processes for respect for rights to lands, territories and resources – including free, prior and informed consent – described in Section 2.4 above.	The outlined Project Management (Section 2.3) will apply for each additional project activity
7	Secondary projects will have similar monitoring elements to those set out in the project description	Additional projects will have equivalent monitoring plans and procedures as described in Section 3.3

3 BENEFITS FOR PEOPLE AND PROSPERITY

3.1 Condition of Stakeholders at Project Start

Current and Potential beneficiaries- Climate risks pose serious threats to Kenya's sustainable development goals. With the largest economy in East Africa and a population of 48.5 million, Kenya serves as the regions' financial, trade and communications hub. The country's economy is largely dependent on rain-fed agriculture and tourism, each susceptible to climate variability and change and extreme weather events. Increasing intersessional variability and declining rainfall in the main rainy season have impacted cereal production in recent years. High population growth in urban areas is leading to expanding informal settlements, which are at risk from water scarcity, flooding and heat. The country also suffers from high rates of poverty⁴⁰ (80%) in arid and semi-arid regions of the north, malnutrition remains unacceptably high, with 29% of children in rural areas and 20% of those living in cities stunted⁴¹, inequality, transparency and accountability, climate change, continued weak private sector investment and the vulnerability of the economy to internal and external shocks⁴².

Firewood and charcoal are considered the two main sources of cooking fuel in most rural and urban areas in Kenya. Statistics from the Ministry of Energy indicate that more than 90 per cent of rural households use firewood for cooking and heating, while more than 80 per cent of urban households use charcoal.⁴³

This firewood is typically large diameter logs that the women and children, primarily girls, are responsible for collecting. As the population has increased and rapid deforestation results, where the industry is also a contributor, women, and children have had to travel farther distances to gather firewood for their three-stone cookfires. Cooking on three-stone cookfires occurs in a closed walled building, made from locally available resources. With these low-efficient cookfires, women and children are exposed to HAP for extended durations, resulting in high levels of Chronic Obstructive Pulmonary Disease (COPD), asthma, and other negative respiratory effects.⁴⁴ Due to the long cooking times on the inefficient TSF, much of the nutrients in the food are lost resulting in the consumption of lower nutrient-rich food.

⁴⁰ Available at: https://www.climatelinks.org/sites/default/files/asset/document/2018_USAID-ATLAS-Project_Climate-Risk-Profile-Kenya.pdf

⁴¹ Anon., n.d. World Food Programme SAVING LIVES CHANGING LIVES. [Online] Available at:

https://www.wfp.org/countries/Kenya?utm_source=google&utm_medium=cpc&utm_campaign=12704015953&utm_content=123511673747&gclid=Cj0KCQjwspKUBhCvARIsAB2lYutQOsesBznVKZ6ZZNs78LCiTUvxSoDCoQGeUNQ3C3vdUNC0vNHfV5laAsUeEALw_wcB&gclid=aw.ds

⁴² Anon., 2022. The World Bank. [Online]

Available at: <https://www.worldbank.org/en/country/kenya/overview#1>

⁴³ EANHS, T., 2017. Nature Kenya- the East Africa Natural History Society (EANHS). [Online]

Available at: <https://naturekenya.org/2017/07/10/fighting-deforestation-through-fuel-wood-management/>

⁴⁴ Rosenthal, J., Quinn, A., Grieshop, A.P., Pillarisetti, A. and Glass, R.I., 2018. Clean cooking and the SDGs: Integrated analytical approaches to guide energy interventions for health and environment goals. Energy for Sustainable Development, 42, pp.152-159 available at:

<https://www.sciencedirect.com/science/article/pii/S0973082617309857>

Implementing Partners- The condition of implementing partners at the start of the project varies between partner and their organizational network and structure. Traditionally, partners are considered based on their current or prior scope of work, existing networks, history of development projects of similar scope or significance, history of work within communities of project implementation and general standing. The TLCRS project is often coupled with existing projects under the IPs work portfolio.

CQC employees in the host country- Even with Kenya’s strong economic growth, expansion of employment in the formal sector has been slow over the last two decades. There has been limited structural change in the composition of recorded employment and the share of the informal sector remained at nearly 83% of total employment in the last two decades. Further, although the country has implemented various policy interventions to address youth employment, the interventions have not resulted in adequate job creation in various sectors for the youth.

It is estimated that close to 500,000 to 800,000 youths are entering the Kenyan job market annually. With total unemployment rate in the country at 9.7% and unemployment rate for 15-24 age cohort at 13.7% in 2015/16, the absorption rate of the youth has been low. The unemployment rate has been increasing since the global financial crisis of 2008/2009 and the outlook for the medium term is worsening. The country needs to create 900,000 new every year between 2015 and 2025 as a way of absorbing the high number of youths joining the job market (World Bank, 2015).⁴⁵

Diversity among stakeholder groups

The table below provides a summary of diversity among the stakeholder groups identified under the project activity.

Stakeholder Group	Aspects of Diversity		Significant changes in the aspects of diversity from the past
End-user	Social	Geographical location	No significant changes
		Rural population	No significant changes
		Equal opportunities/ Amenities	No significant change in diversity observed in access to clean cooking.
	Economic	Unemployment	No significant changes
		Income level	
	Cultural	Religion	85% population is Christian hence no significant change in diversity is observed.
Language		Language of the country is predominantly Swahili and English, hence no significant change in diversity is observed.	

⁴⁵ Onsomu, E.N., 2021. Employment Creation Potential for Youth of Growth Sectors in the Kenyan Economy.

		Cooking practice	Mostly in the rural areas, three stone fire stoves are used, hence no significant change in diversity is observed.
Implementing partners	<ul style="list-style-type: none"> • Geographical location • Work experience in community-based programs • Socio-economic characteristics • Working sectors/ areas 		No significant changes observed in aspect of diversity.
Government representatives, Academic institutions, NGOs, Local stakeholder groups and Environment and Public sector agencies	<ul style="list-style-type: none"> • Geographical location • Socio-economic characteristics • Working sectors/areas 		No significant changes observed in aspect of diversity.

Interaction between the stakeholder groups

The following diagram illustrates the interaction among stakeholder groups involved in this project activity.

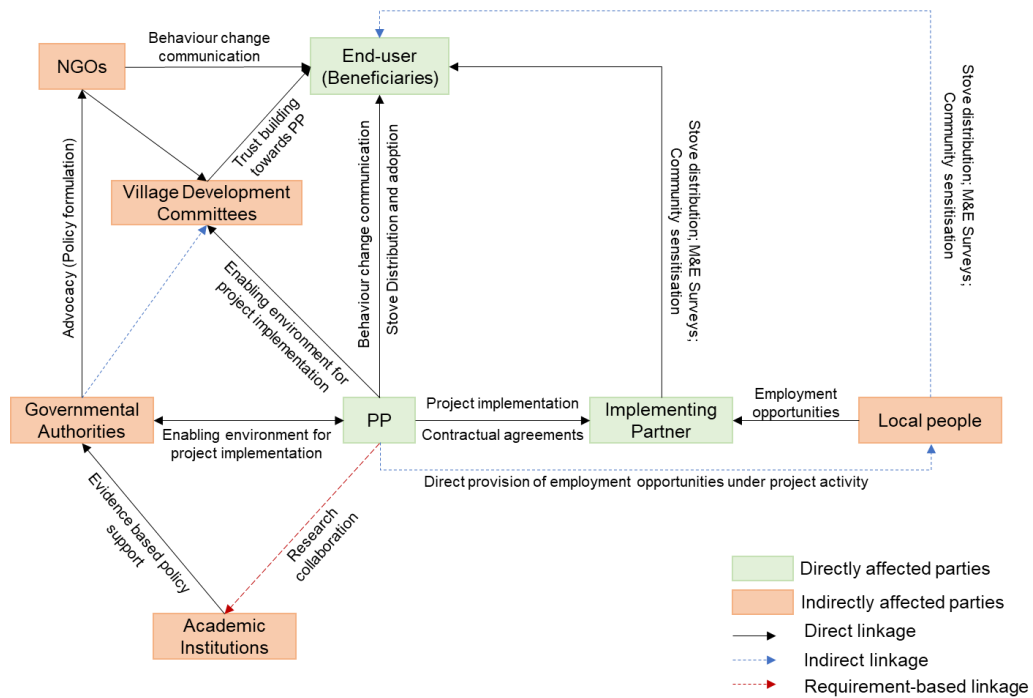


Figure 9: Stakeholder Interaction in cookstove projects

The end-users which are direct beneficiaries are considered to be the most important stakeholder group in the entire interaction matrix. The Project Proponent (PP) is directly/indirectly linked to all stakeholders, particularly the beneficiaries, aiming to induce behaviour change by distributing

improved cookstoves in rural communities. PP associates with implementing partners (IPs) through contractual agreements for project implementation and ultimately lead to project implementation and development. PP may also directly associate with local individuals and employ them for activities such as stove distribution, monitoring surveys, and community sensitization. Further, PP collaborates with government authorities to create enabling environment for project implementation. PP also fosters direct relationship with village development communities, working alongside village chiefs to enable trust among end-users and ensures long term sustenance of the project.

NGOs alongside government bodies play crucial roles in creating supportive environments for project development and promotion, thereby enhancing the adoption of project stoves. Lastly, PP can affiliate with local academic institutions as per project requirements for research collaboration.

3.2 Expected Impacts on Stakeholders

Impact #1	Improved Health Status
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Beneficiaries, Beneficiaries' families, specifically women, children under 5 years of age.
Resulting Change in Well-being	<p>Lowered risk of developing COPD or worsening COPD.</p> <p>Less instance of acute lower respiratory illness and anticipated reduction of burns due to contained flames.</p> <p>Improved overall respiratory health.</p> <p>Increased ability to consume safe drinking water by reducing boiling water time.</p>

Impact #2	Reduction of time spent on unpaid domestic work
Type of Impact	Positive, Predicted, Direct
Affected Stakeholder Group(s)	Beneficiaries (most notably, female, elderly, and children, primarily girls)

Resulting Change in Well-being	<p>Females will have a predicted time saving which can be redirected to income-generating activities or relaxation time.</p> <p>Contributing to enhanced conditions for gender equity.</p>
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Impact #3	Improved Economic Outcomes
Type of Impact	Positive, Predicted, Indirect
Affected Stakeholder Group(s)	Local population, implementation partners, survey agencies recruited on temporary/permanent ⁴⁶ basis during the life of the project
Resulting Change in Well-being	New employment opportunities for the locals

Impact #4	Trainings imparted on climate change, project implementation and monitoring procedures
Type of Impact	Positive, Predicted, Indirect
Affected Stakeholder Group(s)	Implementing Partner Staff, CQC Country Staff
Resulting Change in Well-being	Training and skill development related to community engagement, survey conduction, technical trainings will be provided to many stakeholder groups which is envisaged to empower their lives by not only providing long-term employability but also through increased awareness levels regarding issues related to climate change, social equity

Impact #5	Using TLCRS enabling access to clean technology
Type of Impact	Positive, Predicted, Direct

⁴⁶ Duration of temporary/permanent will be guided by national labour laws.

Affected Stakeholder Group(s)	Project Beneficiaries and their families
Resulting Change in Well-being	Decreased reliance on wood fuel leads to resource conservation and promotes clean technology use.

Impact #6	Reduced income of fuelwood vendors
Type of Impact	Negative, Predicted, Indirect
Affected Stakeholder Group(s)	Local fuel wood vendors
Resulting Change in Well-being	There is a possibility that reduction in the demand of wood-fuel associated with usage of energy efficient ICS might affect the vendors selling fuel wood in Kenya. However, considering the significant demand-supply gap and the over reliance of Kenyan population on fuelwood for cooking needs, decrease in the fuel-wood demand in project location is not likely to have a significant negative impact on wood vendors.

3.3 Stakeholder Monitoring Plan

This section explains the monitoring approach that will be undertaken by the PP to monitor the impacts of the designed project activities observed on the key stakeholders associated with the project activity. The impact mapping for every stakeholder has been conducted with respect to the potential SDG claimable for that stakeholder category.

The following tables describe the mapping of project activity with impacts on stakeholder classes and the monitoring parameter that will be used to assess the intended and unintended impacts of the project activities:

S.No	Stakeholder Group Impacted	Impact	SDG Target and Indicator	Monitoring parameters	Monitoring Approach	Sampling	Monitoring frequency				
1	End User Household	Reduced exposure to PM _{2.5} emissions and household air pollution	Target- 3.9 Indicator- Project specific indicator: Proportion of individuals reporting improved health status after adoption of project stoves. (attributable to reduced exposure to air pollution during cooking)	Reduced PM _{2.5} emissions	Option 1: $Net\ Benefit = PM_{2.5\ baseline} - PM_{2.5\ project}$ where <table border="1"> <tr> <td>$PM_{2.5\ baseline}$</td> <td>PM_{2.5} emissions in baseline stoves (TSF) A value of 52.699 mg/min (or 3.9g/Kg fuel) is considered based on lab test reports of TSF <u>Clean Cooking Catalog (cleancookstoves.org)</u></td> </tr> <tr> <td>$PM_{2.5\ project}$</td> <td>PM_{2.5} emissions in project stoves (in g/kg of fuel used).</td> </tr> </table> Source: Lab test report of Project stoves providing emission level of PM _{2.5} .	$PM_{2.5\ baseline}$	PM _{2.5} emissions in baseline stoves (TSF) A value of 52.699 mg/min (or 3.9g/Kg fuel) is considered based on lab test reports of TSF <u>Clean Cooking Catalog (cleancookstoves.org)</u>	$PM_{2.5\ project}$	PM _{2.5} emissions in project stoves (in g/kg of fuel used).	100% of Operational stove data ⁴⁷ (PM _{2.5} emissions evidenced through secondary literature)	Annually/ Biennially
	$PM_{2.5\ baseline}$			PM _{2.5} emissions in baseline stoves (TSF) A value of 52.699 mg/min (or 3.9g/Kg fuel) is considered based on lab test reports of TSF <u>Clean Cooking Catalog (cleancookstoves.org)</u>							
$PM_{2.5\ project}$	PM _{2.5} emissions in project stoves (in g/kg of fuel used).										
Users reporting reduction in smoke thereby	Option 2: $Net\ Benefit = IC_{baseline} - IC_{project}$ where	Simple Random sampling with 90/95 per cent	Annually/ Biennially								
	Primary cook (mainly women and young girls)										

⁴⁷ Available from corresponding VCS Monitoring Report for the given monitoring period

				leading to improvement in health parameters ⁴⁸	<table border="1"> <tr> <td>$IC_{baseline}$</td> <td>Users experiencing inconvenience due to smoke in baseline. Determined once prior to or concurrent with first verification.</td> </tr> <tr> <td>$IC_{project}$</td> <td>Users experiencing inconvenience due to smoke post project implementation</td> </tr> </table> <p>Source: Monitoring surveys conducted to determine percentage of users reporting improved health status due to reduced exposure to air pollution during cooking.</p>	$IC_{baseline}$	Users experiencing inconvenience due to smoke in baseline. Determined once prior to or concurrent with first verification.	$IC_{project}$	Users experiencing inconvenience due to smoke post project implementation	confidence interval and a 10 per cent margin of error achieved for monitored parameter, as per VMR0006 methodology	
$IC_{baseline}$	Users experiencing inconvenience due to smoke in baseline. Determined once prior to or concurrent with first verification.										
$IC_{project}$	Users experiencing inconvenience due to smoke post project implementation										
2	End User Households	Affordable and clean energy	Target- 7.1 Project Specific Indicator: Number of improved cookstoves distributed in project area.	Monitor number of ICS distributed and operating under project as an indicator of clean technology	$Net\ Benefit = ICS_{project} \times N_y$ <p>where</p> <table border="1"> <tr> <td>$ICS_{project}$</td> <td>Number of ICS installed representing access to clean technology in project scenario</td> </tr> <tr> <td>N_y</td> <td>Proportion of operational stoves</td> </tr> </table> <p>Source: ICS distribution records and ex-post monitoring surveys conducted to determine proportion of operational stoves</p>	$ICS_{project}$	Number of ICS installed representing access to clean technology in project scenario	N_y	Proportion of operational stoves	$ICS_{project}$ - 100% data ICS distributed N_y - Simple Random sampling with 90/95 per cent confidence interval and a 10 per cent margin	Annually/ Biennially
$ICS_{project}$	Number of ICS installed representing access to clean technology in project scenario										
N_y	Proportion of operational stoves										

⁴⁸ Such as reduced cough from smoke inhalation and less irritation of eyes resulting from soot and smoke.

							of error achieved for monitored parameter, as per VMR0006 methodology	
3	Women and young girls	Reduced drudgery	Target- 5.4 Project Specific Indicator: Time spent on unpaid domestic and care work, by sex, age and location.	Number of users reporting time saving due to reduction in fuel collection amount and faster cooking on project stoves	$Net\ Benefit = T_{baseline} - T_{project}$ where		Simple Random sampling with 90/95 per cent confidence interval and a 10 per cent margin of error achieved for monitored parameter, as per VMR0006 methodology	Annually/ Biennially
					$T_{baseline}$	Average time spent in fuel collection and cooking in baseline scenario. Determined once prior to or concurrent with first verification. Alternatively, a value of 10.5 hrs/week can be assumed (Review of Woodfuel Biomass Production and Utilization in Africa: A Desk Study (unep.org)) ⁴⁹		
						$T_{project}$	Average time spent in fuelwood collection and cooking in project scenario (in hours/household/day)	

⁴⁹ This value only accounts for the time spent in collecting fuelwood, hence if used, time spent in fuelwood collection post project implementation must only be considered.

					Source: Monitoring surveys conducted to determine average time saved in project scenario.						
4	Implementation Partners and Survey Agencies	Employment generation	Target- 8.3 Project Specific Indicator: Number of local individuals employed during the project lifetime.	i. Number of local people employed for ICS distribution activities ii. Number of local people employed for conducting impact survey.	$Net\ Benefit = ES_{project} - ES_{baseline}$ where <table border="1" data-bbox="1014 521 1524 922"> <tr> <td>$ES_{project}$</td> <td>Gainfully employed staff in project scenario.</td> </tr> <tr> <td>$ES_{baseline}$</td> <td>Gainfully employed staff in baseline. A value of 0 shall be considered as in absence of project activity there would not have been any increase in employment opportunity.</td> </tr> </table> Source: Employment records	$ES_{project}$	Gainfully employed staff in project scenario.	$ES_{baseline}$	Gainfully employed staff in baseline. A value of 0 shall be considered as in absence of project activity there would not have been any increase in employment opportunity.	100% of data of employed individuals	Annually/ Biennially
$ES_{project}$	Gainfully employed staff in project scenario.										
$ES_{baseline}$	Gainfully employed staff in baseline. A value of 0 shall be considered as in absence of project activity there would not have been any increase in employment opportunity.										
5	CQC staff	Skill set development and awareness generation	Target- 4.3 Indicator- Project Specific Indicator: Number of individuals who received any informal training	Number of individuals trained	$Net\ Benefit = Training_{project} - Training_{baseline}$ where <table border="1" data-bbox="1014 1157 1524 1417"> <tr> <td>$Training_{project}$</td> <td>Trainings provided in project scenario</td> </tr> <tr> <td>$Training_{baseline}$</td> <td>Trainings provided in baseline. A value of 0 shall be considered as in absence of project</td> </tr> </table>	$Training_{project}$	Trainings provided in project scenario	$Training_{baseline}$	Trainings provided in baseline. A value of 0 shall be considered as in absence of project	100% of data	Annually/ Biennially
$Training_{project}$	Trainings provided in project scenario										
$Training_{baseline}$	Trainings provided in baseline. A value of 0 shall be considered as in absence of project										

						activity, no trainings would be required to be conducted.			
					Source: Training Records; Feedback forms				

Sampling Plan

The end-user impact survey indicated in the table above refers to the primary survey that will be conducted to assess the impacts associated with the implementation of project activities. The following section describes the sampling approach that will be adopted to conduct these surveys.

Target Population: The quantification of benefits achieved through the project will be conducted by consulting the **end-user beneficiaries, i.e., the households** that have received the ICS.

Sampling Method: Simple random technique will be adopted to conduct a sampling survey among ICS batches. This approach will be adopted owing to the following aspects:

- Homogenous nature of the project activity, i.e., common technology (ICS) with similar operating characteristics is distributed across different states/provinces of the country.
- Existing of homogeneous sub-population

To ensure a random selection of ICS, random number generators shall be applied. Each ICS in the target population is uniquely identifiable by its unique ID number. Each ICS can thus be allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of ICS in the database for that pre-defined sampling frame. Applying the random number generators, the ICS can then be randomly chosen from the defined population up to the required sample size as calculated by the project proponent.

Sampling Unit: Households that have received project stoves.

Sampling Parameters: The following two parameters are used to estimate the sample size:

$N_{y,i,j}$:	Visual inspection of the premises to see if ICS is operational and in use. Interview with end-user if required to verify that ICS is still in use (Yes/No)
$B_{y=1,new,i}$ survey	Interview with end-user to determine the average quantity of firewood used in the project stove per day. Measurement campaigns for estimation of consumption of wood in project households. (Wood fuel quantity)

Sample Size:

For the estimation of the proportion or mean value of the parameters investigated, the minimum sample size for each sample frame must achieve 90/10 confidence/precision, as per VMR0006 methodology. The procedure to determine the sample of households will ensure that they adequately represent the broader project population, minimizing sampling error. Using a 90 per cent confidence level, and a 10 per cent margin of error, random samples will be selected from each Primary Sampling Unit. To calculate the required sample size estimates, proportions and the mean values are required. Furthermore, the standard deviation needs to be assumed in the case of sampling for a mean value. As per Guidelines for Sampling and surveys for CDM project activities and programmes of activities, there are different ways available to obtain the estimates of the parameter of interest:

- a) Refer to the result of previous studies and use these results.

- b) In a situation where information from previous studies is not available, a preliminary sample as a pilot could be conducted and that sample is used to provide the estimates.
- c) Use best guesses based on the researcher's own experiences.

For the registration purpose of project, option (c) as stated above shall be applied. For the following monitoring periods, the estimates can be adjusted by taking the results of the previous monitoring period(s) into account or the result from recent pilot study which is conducted after the previous monitoring periods.

The following assumptions are made to exemplify the sample size calculation for the parameters.

1. An overview of the estimated sample sizes for a hypothetical population of 100,000 ICS units applying a level of 90/10 is provided below. It is likely that all the sample frames for each parameter will include fewer than 100,000 ICS in the first monitoring period, so this is a conservative approach. Hence, population size, N , is taken as 100,000 households/ICS (Assuming one ICS for one household).
2. It is expected at least 80% of ICS is still in operation, hence the expected proportion p is taken as 0.8.

Sample size calculation:

Parameter $N_{y,i,j}$:

The calculation of the required sample size for each parameter in the first monitoring period is illustrated below. In all cases a conservative approach is taken, however, if for any parameter the required confidence/precision is not met then the Project Proponent will randomly select an additional sample and collect further data from this sample to ensure the pooled data meet or exceed the required thresholds.

Based on the above assumptions, the resulting sampling size is calculated as:

$$n \geq \frac{1.645^2 \times 100,000 \times 0.8(1 - 0.8)}{(100,000 - 1) \times 0.1^2 \times 0.8^2 + 1.645^2 \times 0.8(1 - 0.8)} = 67.61$$

Therefore, in this case, a sample size of 68 is to be sampled from each primary sampling unit.

Parameter $B_{y=1,new,i,survey}$:

To determine sample size in the first monitoring period, the performance of ICS is characterized by the range of likely mean wood consumption and the likely values of SD relative to the mean, according to the type of ICS. The ICS models that are manufactured in modern factories tend to be very highly efficient (30-50% thermal efficiency) and have been designed to meet stringent efficiency specifications, so the standard deviation is expected to be relatively low.

To estimate the sample size for parameter $B_{y=1,new,i,survey}$ the following equation is used:

$$n \geq \frac{1.645^2 NV}{(N - 1) \times 0.1^2 + 1.645^2 V}$$

Where:

$$V = \left(\frac{SD}{mean} \right)^2$$

n = Sample size

N = Population size (Total number of households/ICS)

$mean$ = Expected mean of ICS thermal efficiency

SD = Expected standard deviation

1.645 = Represents the 90% confidence required

0.1 = Represents the 10% relative precision

Based on the above assumptions, the sample size calculation would be

$$n \geq \frac{1.645^2 \times 100,000 \times \left(\frac{0.076}{0.38} \right)^2}{(100,000 - 1) \times 0.1^2 + 1.645^2 \times \left(\frac{0.076}{0.38} \right)^2} = 10.82$$

The resulting sample size based on the above equation is smaller than 30, since $B_{y=1, new, i, survey}$ is a numeric mean value (i.e. not a proportion or percentage) the Student's t-distribution shall be used as per paragraph 14 of "Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 09.0.

The sample size for parameter $B_{y=1, new, i, survey}$ under t-distribution is referred to the equation below:

$$n = \left(\frac{t_{n-1} \times SD}{0.1 \times mean} \right)^2$$

Where t_{n-1} is the value of the t-distribution for 90% confidence when the sample size is n . Since the sample size is not known yet, the first step is to use the value for 90⁵⁰% confidence when the sample is large, i.e., 1.645 and then redefine the calculation.

$$n = \left(\frac{1.645 \times 0.076}{0.1 \times 0.38} \right)^2 = 10.82$$

Thus, n is rounded up to 11.

The calculation now needs to repeat using t-value for 90% confidence and $n = 11$

$$n = \left(\frac{2.228 \times 0.076}{0.1 \times 0.38} \right)^2 = 19.86$$

And n is rounded to 20.

⁵⁰ For CPAs not qualifying the conditions under paragraph 12 of Tool 19, the requirements of the applied methodology shall apply.

The calculation now needs to be repeated using t_{n-1} value for $n = 20$. The process should be iterated until there is no change to the value of n .

t_{19-1}	2.093
$n=$	17.52
Round up	18

t_{18-1}	2.110
$n=$	17.81
Round up	18

The repeated calculation shows that $n = 18$. Thus, the sample size to be sampled from each sampling unit is 18

Since parameters $N_{y,j,j}$, and $B_{y=1,new,i, survey}$ share the same sampling units, PP may choose to have one common survey for these two parameters with the largest number of sample size between these two parameters being chosen. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs. At the same time, this approach ensures the random selection of samples for every parameter.

Oversampling will be done, not only to compensate for any attrition, outliers or non-response associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved, and additional sampling efforts would be required. The sample size shown above will be adjusted upwards to account for non-responses, PP shall determine the appropriate non-responses rate based on previous experience.

Data type and data collection tool: Qualitative data regarding the benefits and co-benefits aligned with project implementation will be collected from end-users to obtain unbiased and reliable information on the SDGs claimed under the SD VISta programme. This will be captured through a structured questionnaire which will be prepared based on effective brainstorming, review of literature and baseline scenario assessment of the project locations. Questionnaire comprising of both open and closed-ended questions will be adopted to gather feedback from the end-users and relevant stakeholders within the countries.

Quality Assurance/ Quality Control:

PP will apply measures to ensure the required confidence/precision for each sampled parameter is met, allowing for non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter will depend on the cost of each data collection approach and the logistics required. The PP will determine the most effective measure for each parameter from the following list (illustrated using a required sample size of 20 and an effect of non-response of 2 to 4 ICS):

- Oversampling: Randomly draw a sample of a minimum of 24 ICS and collect data from each
- Buffer Group: Randomly draw a sample of a minimum of 24 ICS and collect data from only 22 ICS. If this would not result in the required sample size data would be collected from the additional 2 ICS that were selected in the sample.

- Draw an additional sample: Randomly draw a sample of 22 ICS and collect data from these. If the required sample size is not achieved, an additional sample of 2 elements will be drawn and included in the sample.
- Use lower confidence bound (of $N_{y,i,j}$, $B_{y=1,new,i, survey}$) or, with a conservative approach according to the parameter definitions,

The PP may choose to stop monitoring a particular parameter once the required level of confidence/precision has been reached if the calculated minimum number of samples has been achieved. As an example, the following steps could logically be followed for the case of applying a 30% buffer:

1. Visit the first 10% of premises required for the 30% buffer. If the number of responses is sufficient to achieve the required reliability level, then stop sampling.
2. If step 1 is not sufficient to achieve the required reliability level, then visit the next 10% of premises (increases the additional sampling to 20% of the 30% buffer). If this additional sampling is sufficient, then stop sampling.
3. If step 2 is not sufficient to achieve the required reliability level, then complete the final 10% of the additional sampling buffer (bringing the total to 30%).

The sampling plan has the following procedures in place to ensure good quality data. The PP will ensure that field personnel have reviewed, understand, and signed the monitoring plan, including provisions for maximizing response rates, and documenting out-of-population cases, refusals, and other sources of non-response. Quality control and assurance strategy will be documented. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from the interviewer. The monitoring plan will explain how to properly survey households to prevent bias from the interviewer. In the case a household refuses to participate, another household will be chosen at random. To reduce interviewer bias, a good questionnaire design and well-tested questionnaires will be used.

The calculation of the sample size will be carried out using estimates for parameter proportions, mean values and standard deviations, as the actual characteristics of the population/sampling frame are unknown. To ensure the quality of the sampling results, the PP can draw on the provisions for reliability calculations as provided by the Guidelines for Sampling and Surveys in CDM Project Activities and Programme of Activities (version 04). If the sampling results do not fulfil the required level of confidence and precision, the PP can undertake additional samples. If the reliability is still not sufficient after additional samples or other measures, the sampling may be repeated with increased sample size. Alternatively, the PP may choose to apply the lower bound or higher bound according to the more conservative approach.

Data archiving

Hard copies of the surveys will be kept, and the registration database will have a backup. Original stove purchase contracts or other means of acceptance by the users will be stored in the main office for the coordinating entity. A backup of the registration database will also be stored on an electronic medium by the PP. All data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of VCUs for the project activity, whichever is later.

Analysis

The PP will manage a project database that includes the following data that can be directly attributable to the project activity, thereby allowing unambiguous determination of the emission reductions attributable to the project:

- A list of households participating in project activity, including name, community/location, distribution date and unique serial number
- Where replacements are made, assurance that the efficiency of the new ICS is like the specified

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations and result in the request for issuance of VCUs. The stoves that are not in use will be excluded from emissions reduction calculations and will not be counted towards the total number of ICS in operation during the monitoring period.

Implementation

Sampling for the purpose of emission reduction calculation and elaboration of the monitoring report will occur at the end of each monitoring period. This sampling will be conducted by trained personnel. The operations team, formed by PP, will be responsible for managing household data collection and entry into the project database. Field personnel will receive training on how to properly deal with surveying techniques and reduce errors and sign a document certifying that there is no conflict of interest of those involved in data collection and analysis. If there is a conflict of interest, the personnel will not be allowed to participate in data collection and analysis. The project database will record the start and end dates of each monitoring period and record the emission reductions attributable to each monitoring period. Appropriate record-keeping procedures will be implemented, preventing any occurrences of double counting. An internal review of the project database will be able to determine the status of the project, the duration of previous monitoring periods, the households delivering monitoring data, and current verification activities.

Assessment for Leakage

According to methodology VMR 0006, version 1.1, section 8.3; Leakage shall be considered as default 0.95 in accordance with Section 5.4 of AMS-II.G., therefore, a default value of leakage as 0.95 will be applied.

Monitoring Reporting

The PP will assess all monitoring data and produce one or two monitoring reports for the project for the VVB to verify corresponding to the preceding monitoring period of the project. This report will present the data relating to the emission reductions generated by the project at the time of the monitoring period.

3.4 Net Positive Stakeholder Well-being Impacts

All the impacts identified in section 3.2 except for six, which is “Fewer wood vendors” generate a positive impact on the stakeholders. However, considering that ~56%⁵¹ of the rural population of Kenya rely on wood fuel and there exists a significant demand-supply gap for fuel wood in the country, any reduction in demand for wood fuel within project boundary will shift the stakeholders selling wood to outside project boundary, without causing significant reduction in their business as there would still exist a considerable demand for the product. Even though impact on fuel sellers is an unintended negative impact because of the project activity, but based on the existing scenario in Kenya, it does not make considerable impact and outweighed by the positive impacts of the following combined, long-term sustainable development benefits observed for the project’s stakeholders:

1. A higher number of population will have access to clean cooking technology for meeting their daily cooking needs.
2. Women and young girls will have to spend less time on hard menial, unpaid and dull work of collecting wood fuel and household chores like cooking.
3. Women and young girls can use the time saved from cooking and fuel wood collection in more productive activities which can generate income as well.
4. Women and children will be exposed to lower levels of HAP, as ICS would reduce the amount of PM_{2.5} emissions being released from cookstoves.
5. Improved health status is expected to be achieved for all the household members due to reduced levels of HAP
6. Fewer children will be on a risk of experiencing burn injuries associated with open cooking fires
7. Local individuals will be trained and have better vocational skills enhancing their long-term employability and influencing their overall social and economic well-being.

⁵¹ Demographic and Health Survey, Kenya, 2014, <https://www.dhsprogram.com/pubs/pdf/FR308/FR308.pdf>

4 BENEFITS FOR THE PLANET

4.1 Condition of Natural Capital and Ecosystem Services at Project Start

Climate risks pose serious threats to Kenya’s sustainable development goals. With the largest economy in East Africa and a population of 48.5 million, Kenya serves as the regions’ financial, trade and communications hub. The country’s economy is largely dependent on rainfed agriculture and tourism, each susceptible to climate variability and change and extreme weather events. Increasing inter-seasonal variability and declining rainfall in the main rainy season have impacted cereal production in recent years. Recurrent droughts and floods—likely to be exacerbated by increasing temperatures, heavy rainfall events and sea level rise— lead to severe crop and livestock losses, famine and displacement.⁵²

Climatic conditions also influence energy production in Kenya. Traditional fuels like wood, charcoal, dung and agricultural residues continue to be used by over 85 per cent of Kenyans (ROK, 2011). Access to these energy sources is becoming increasingly restricted due to the loss of forest cover, rising populations, existing land tenure arrangements and inefficient utilization (Mugo & Gathui, 2010). Climate change could accentuate this situation by altering the growth of forests and agricultural crops. Reliance on the traditional sources, i.e. wood for cooking-fuel has adverse health implications for women and children, because of smoke in poorly ventilated indoor conditions as well as the time burden associated with collecting wood and agricultural residues. As these energy resources are primarily derived from forests and farmlands, their use also contributes to deforestation and its associated negative impacts on soil and water resources (Mogaka et al., 2006; Wong et al., 2005). Loss of forest cover, rising populations, existing land tenure arrangements and inefficient utilization have combined to create persistent and increased scarcity of fuelwood (Mugo & Gathui, 2010).⁵³

4.2 Expected Impacts on Natural Capital and Ecosystem Services

Impact #1	Reduced demand for large diameter non-renewable firewood from live trees due to only needing finger-sized woody biomass, i.e., twigs and crop residues, for cooking on the TLCRS
Type of Impact	Positive, actual, direct

⁵² Anon., 2018. USIAD. [Online]

Available at: <https://www.climatelinks.org/resources/climate-risk-profile-kenya>

⁵³ Parry, J.E., Echeverria, D., Dekens, J. and Maitima, J., 2012. Climate risks, vulnerability and governance in Kenya: A review. Commissioned by: climate risk management technical assistance support project (CRM TASP), joint initiative of bureau for crisis prevention and recovery and bureau for development policy of UNDP.

Affected Natural Capital and/or Ecosystem Service(s)	Live plant biomass, Biodiversity and species Richness, Soil and Water Conservation
Resulting Change in Condition	By slowing the consumption of woody biomass for cooking purposes and by eliminating the need for large diameter woody biomass due to the technology in the TLCRS, the resulting drop in demand slows deforestation, thus increasing the above-ground biomass in the adjoining forests near the project area. Reduction in unsustainable harvesting of plant biomass would in turn reduce soil erosion and result in improvement in biodiversity and species richness of the implementation area.

Impact #2	Avoided emission of GHGs made possible by using TLCRS
Type of Impact	Positive, predicted, indirect
Affected Natural Capital and/or Ecosystem Service(s)	Air quality in the households as well as surroundings
Resulting Change in Condition	The project stoves require less fuelwood for producing the same amount of thermal energy, therefore, resulting in lesser carbon dioxide emission in the atmosphere. As carbon dioxide is a greenhouse gas, its reduced emission translates to a positive impact on climate change.

4.3 Natural Capital and Ecosystem Services Monitoring Plan

In addition to monitoring the ICS implemented each year, CQC will monitor the following to evaluate the net ecological impact of the project:

- Survey the amount of woody biomass used to fuelwood to meet the thermal energy needs for meal preparation on the TLCRS and calculate the reduction in woody biomass used in comparison to a TSF cookstove.

Natural capital use will also be monitored through fuel use studies contracted by CQC to academic partners. Through these studies, CQC will ascertain the natural capital savings, specific to impacts 1 and 2 in the above charts.

The following data and parameters will be monitored under the project to assess the impacts on the natural capital and ecosystem. The sampling approach adopted for collecting the corresponding data has been presented in section 3.3 of the PD.

SL No.	Natural Capital Impacted	Impact	SDG Target and Indicator	Monitoring parameters	Monitoring Approach	Sampling	Monitoring frequency
1	Atmosphere	Reduced levels of emissions and household air pollution	Target-13.0 Indicator- Tonnes of greenhouse gas emissions avoided or removed.	Reduced GHG emissions	$ER_{y,i,j} = B_{y,sav,i,j} \times n_{y,i,j} \times f_{NRB,y} \times NCV_{biomass} \times (EF_{wf,CO2} + EF_{wf,non\ CO2}) \times 0.95$ Source-Monitoring Report for the corresponding SD VISTA period of VCS Project ID 2349	Simple Random sampling with 90/95 per cent confidence interval and a 10 per cent margin of error achieved for monitored parameter, as per VMR0006 methodology	Annually/ Biennially
2	Forest Ecosystem adjoining project implementation area	Increase in Above Ground Biomass	Target-15.2 Indicator- 15.2.1: Progress towards sustainable forest management by	Fuelwood saved by the project stoves	$B_{agb} = B_{y,sav,i,j} \times f_{NRB,y}$ Source-Monitoring Report for the corresponding SD VISTA period of VCS Project ID 2349. The equation for calculating $B_{y,savings,i,j}$ has been provided in Appendix D	Simple Random sampling with 90/95 per cent confidence interval and a 10 per cent margin of error achieved for monitored parameter, as	Annually/ Biennially

			increasing above ground biomass in forests			per VMR0006 methodologyc orresponding SD VISTA MP being considered in estimations.	
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4.4 Net Positive Natural Capital and Ecosystem Services Impacts

By replacing three-stone cooking open fire and other traditionally used fuel-inefficient cook stoves with ICS technology, the primary project activity, will generate an estimated ~73.83 tCO₂e GHG emission reduction per stove over the ten-year project crediting period.

The replacement of TSF with ICS in 0.25 million Kenyan households will reduce an estimated ~36.04 tons of non-renewable woody biomass/stove over the ten-year project crediting period. The quantitative equations used for estimations of the woody biomass savings have been presented in Appendix D while the estimations can be referred from Monitoring Report for the corresponding SD VISTA period of VCS Project ID 2349.

5 APPENDIX

References

Appendix A: Causal Chain

Appendix B: Beneficiary Brochure (English)

Note: Brochure includes Grievance and country-specific Feedback Number.

Appendix C: List of Abbreviations

Appendix D: Fuel-wood savings estimates

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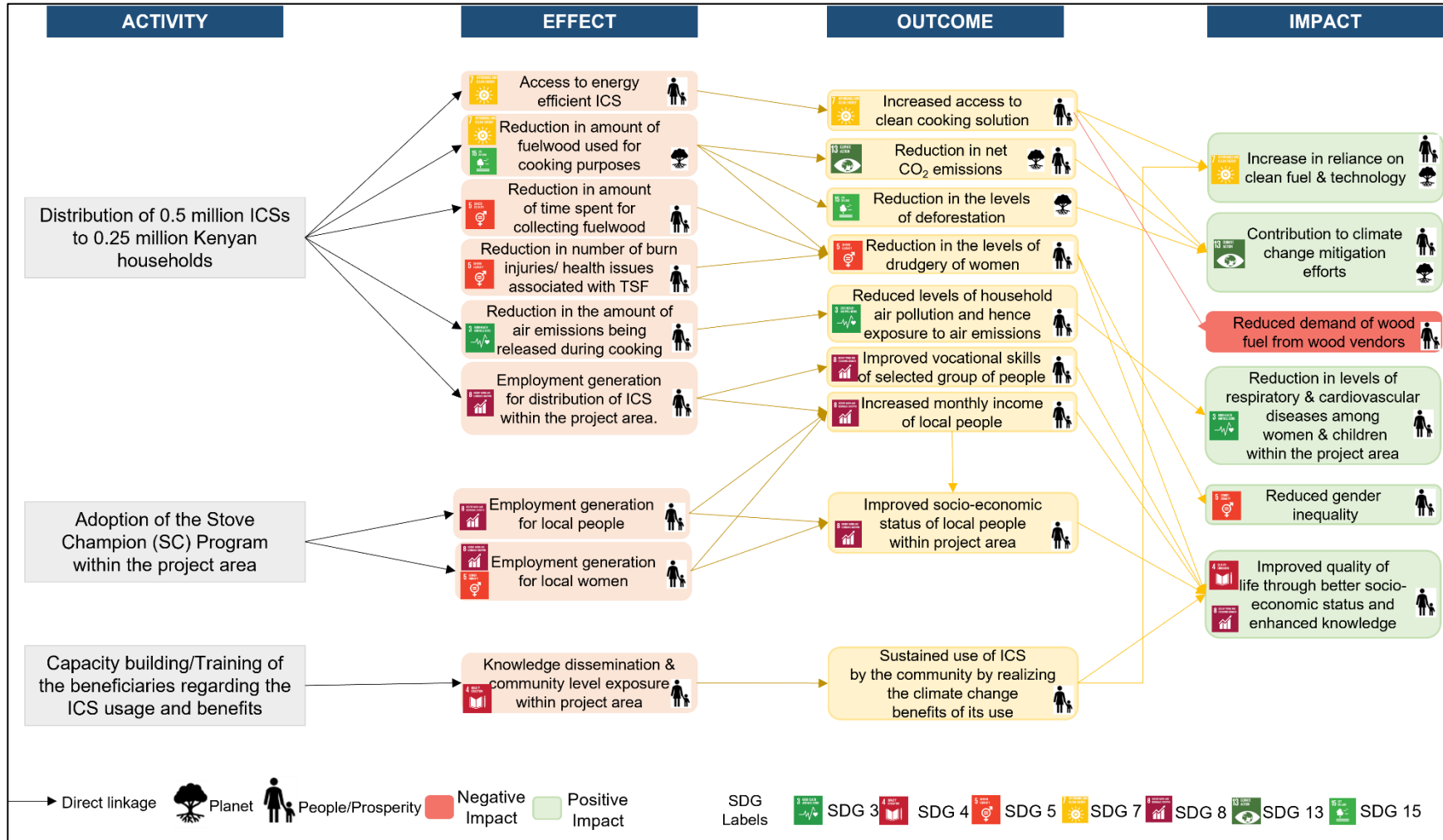
Parry, J.E., Echeverria, D., Dekens, J. and Maitima, J., 2012. Climate risks, vulnerability and governance in Kenya: A review. Commissioned by: climate risk management technical assistance support project (CRM TASP), joint initiative of bureau for crisis prevention and recovery and bureau for development policy of UNDP.

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Appendix A: Causal Chain



Appendix B: Brochure (English)

CQuestCapital

TLC-CQC ROCKET STOVE - GUIDELINES

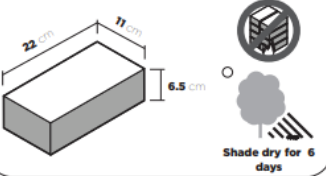
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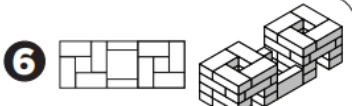
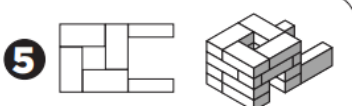
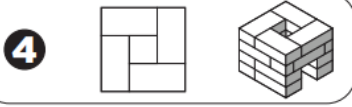
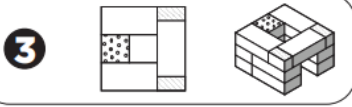
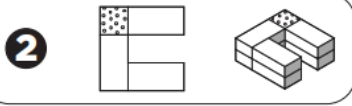


BRICKS

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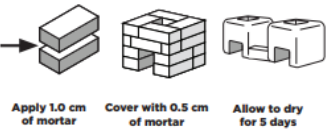


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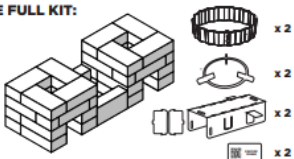


MORTAR

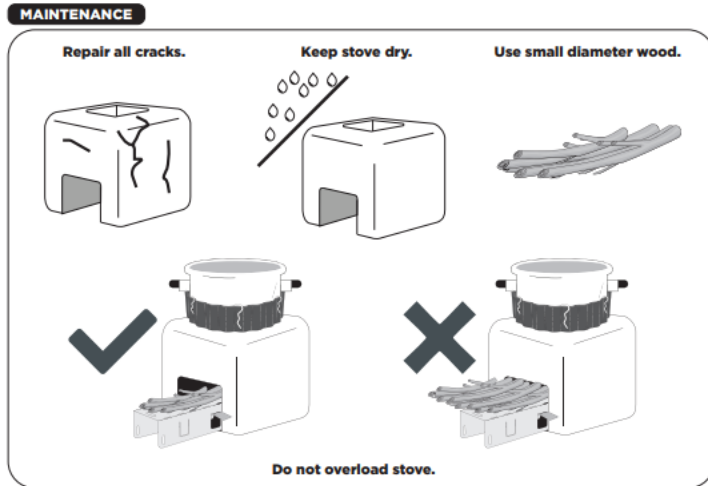
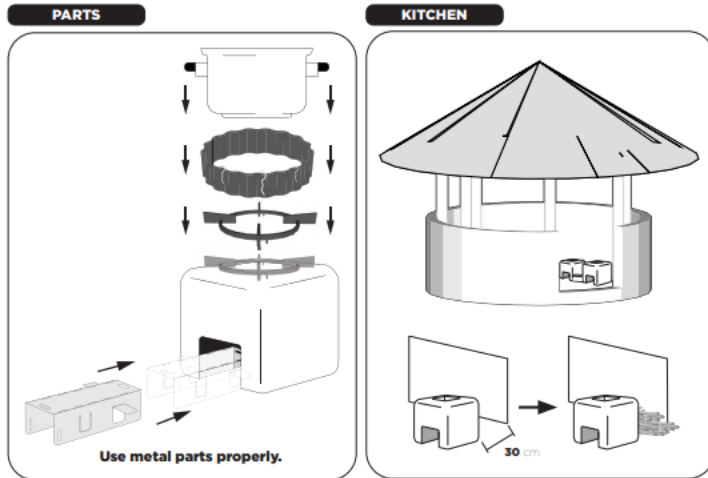
ITEMS YOU WILL NEED:



THE FULL KIT:



C-Quest Capital encourages feedback on projects and general complaints. To provide please call +263 71 809 5431



Appendix C: List of Abbreviations

ADC: Area Development Committee

COPD: Chronic Obstructive Pulmonary Disease

CQC: C-Quest Capital LLC

GP: Grouped Project

GVH: Group Village Headperson

HAP: Household Air Pollutant

ICS: Improved Cookstoves

ILO: International Labour Organization

LSC: Local Stakeholder Consultation

PM_{2.5}: Particulate Matter

PP: Project Proponent

SC: Stove Champions

SDG: Sustainable Development Goals

TA: Traditional Authority

TLCRS: Total Land Care Rocket Stoves

TSF: Three-stone fire stove

VCS: Verified Carbon Standard

VCUs: Verified Carbon Units

Appendix D: Fuel-wood savings estimates

Equation used for wood saving estimation

$$B_{y,sav,i,j} = B_{y=1,new,i,j,survey} \times \left(\frac{\eta_{new,i}}{\eta_{old}} - 1 \right)$$

Where:

$\eta_{old,i,j}$ = Efficiency of baseline devices that are replaced by project devices of type i (fraction)

$\eta_{new,i,j}$ = Efficiency of project device of type i (fraction)

$B_{y=1,new,i,j,survey}$ = Quantity of woody biomass used per project device of type i from batch j (tonnes)