



# Sustainable Development Verified Impact Standard

## GROUPED PROJECTS FOR CAMBODIA WATER PURIFIER

Document Prepared by

Sustainability Investment Promotion and Development  
Joint Stock Company

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<b>Project Proponent(s)</b>	Sustainability Investment Promotion and Development Joint Stock Company URL: <a href="https://carbonvietnam.com/">https://carbonvietnam.com/</a> Contact name: Ms. Nguyen Thi Hong Hanh Email: <a href="mailto:info@carbonvietnam.com">info@carbonvietnam.com</a> Contact: +84 243 519 0955
<b>Assessor Contact</b>	Carbon Check (India) Private Limited 2071/38, 2 <sup>nd</sup> Floor, Naiwala, Karol Bagh, New Delhi-110005 URL: <a href="http://www.carboncheck.co.in">www.carboncheck.co.in</a> E-mail: <a href="mailto:info@carboncheck.co.in">info@carboncheck.co.in</a> / <a href="mailto:projects@carboncheck.co.in">projects@carboncheck.co.in</a>

	Contact #: +91 (120) 4373114
<b>Project Lifetime</b>	02 May 2022 – 01 May 2032; 10-year lifetime
<b>History of SD VISTA Status</b>	No previous attempts at SD Vista certification made to date
<b>Other Certification Programs</b>	VERRA Verified Carbon Standard (Project ID 3052)
<b>Expected Future Assessment Schedule</b>	Initial validation expected March 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)	<p>The project activity provides energy efficient water purifier for households who use the traditional cookstove for boiling drinking water. End-user can directly drink water from project device without boiling. This contribute to providing access to basic services (clean cooking technology considered as basic service under access to modern energy) to the poor and vulnerable communities of Cambodia. The project will lead to providing access to 1,000,000 ICSs by the end of its lifetime.</p> <p>Hence, the grouped project will achieve SDG 1. End poverty in all its forms everywhere</p>	1.4	<p>Project specific indicator: Number of households received WPs as an access to clean fuel and technology</p>	Implement activities to increase	3.2	SD VISta-labeled VCUs
2)	<p>The project activity provides safe drinking water for households who do not access clean water and use woodfuel to boil drinking water. Therefore, the grouped project will lead to reduction air population thereby in improved health conditions of households, especially women and children. Furthermore, will also help to reduce the number of deaths and illnesses caused by water pollution.</p> <p>Hence, the grouped project will achieve SDG 3. Ensure healthy lives and promote well-being for all at all ages.</p>	3.9	3.9.1. Mortality rate attributed to household and ambient air pollution	Implement activities to decrease	3.2	SD VISta-labeled VCUs

3)	<p>Local gain employment possibilities from the conception and execution of the group projects, and the project proponent provides training that enables them to acquire necessary skills and contribute to sustainable development.</p> <p>Hence, the grouped project will achieve SDG 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	4.3	<p>Project specific indicator: Number of people receiving formal and/or non-formal education and training</p>	Implement activities to increase	3.2	SD VISTA-labeled VCUs
4)	<p>Through time savings from cutting, gathering and carrying firewood from far trees to households, the initiative lessens the drudgery experienced by women and children. If these responsibilities are carried out without assistance, they constitute a significant contributor to gender inequity.</p> <p>Hence, the grouped project will achieve SDG 5. Achieve gender equality and empower all women and girl.</p>	5.4	<p>Project specific indicator: Number of end users reporting reduction in their time spent on unpaid domestic and care work, by sex, age and location.</p>	Implement activities to increase	3.2	SD VISTA-labeled VCUs
5)	<p>The project activity aims to give access to safe drinking water by the form of clean water technology in households.</p> <p>By distributing 1,000,000 water purifiers, the grouped project will lower exposure to unsafe water for 1,000,000 households in Cambodia.</p> <p>Hence, the grouped project will achieve SDG 6. Ensure availability and sustainable management of water and sanitation</p>	6.1	<p>Project specific indicator: Increase of population who are used safely managed drinking water service</p>	Implement activities to increase	3.2	SD VISTA-labeled VCUs
6)	<p>The project activity will create employment right along distribution and level of mass production</p>	8.3	<p>Project specific indicator: Number of informal employment in total</p>	Implemented activities to increase	3.2	SD VISTA-labeled VCUs

	Hence, the project will achieve SDG 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all		employment, by sector and sex			
7)	<p>The grouped project contributes to GHG emission reductions. The estimated annual emission reductions for the first project activity under the grouped projects is 43,129 tCO<sub>2</sub>e/year</p> <p>Hence, the project will achieve SDG 13. Take urgent action to combat climate change and its impacts.</p>	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implement activities to decrease	VCS validation report	SD VISTA-labeled VCUs
8)	<p>The grouped project will contribute an estimated reduction of deforestation of 1.638 tonnes of biomass per water purifier per year from forest surrounding the communities thereby leading to an increase in above ground biomass in these forests.</p> <p>Hence, the grouped project will achieve SDG 15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	15.2	Project specific indicator – Amount of non-renewable biomass saved	Implemented activities to increase	4.2	SD VISTA-labeled VCUs

## 2 PROJECT DESIGN

### 2.1 Project Objectives, Context and Long-term Viability

#### 2.1.1 Summary of Project Sustainable Development Objective(s)

The target households do not access clean water systems and use firewood to boil drinking water in absence of the grouped project. The project activity will distribute water purifiers to them and enable and enhance households to achieve several sustainable development objectives:

##### 1. Economic Well-being

**SDG 1.** The grouped project activity will help access to a basic service i.e clean fuels when using project water purifier to household in the rural and semi-urban of Cambodia. This will lead to a healthy and saving time at the households for boiling and collecting wood fuel (1.4).

**SDG 8.** During whole lifetime of the grouped project, it needs labour intensive (including manufacture, distribution, spot checks and periodic surveys for ensuring streamline operation of the project). Hence the number of temporary and permanent jobs created. (8.3)

##### 2. Social well-being

The project is intended to produce the following community benefits, which are intended to promote the general social well-being within the project operating area:

**SDG 3.** Due to prevented fuelwood burning for water boiling, there will be less smoke in kitchen and surrounding areas, as a result improved indoor air quality directly benefits the health of the women and children who are usually in charge of cooking (3.9.1)

**SDG 4.** By educating the community about climate change issues and raising awareness of the value of sustainable development, health, nutrition, and well-being which help locals gain more relevant and vocational skills by providing formal and informal training that will increase their chances of landing good jobs (4.3).

**SDG 5.** Through time savings from cutting, gathering and carrying firewood from far trees to households, the initiative lessens the drudgery experienced by women and children. If these responsibilities are carried out without assistance, they constitute a significant contributor to gender inequity. (5.4)

**SDG 6.** The project activity is provision of safe drinking water through water purifier to households in Cambodia who do not access clean water systems and reliant on wood fuel for boiling water. The project device will provide equitable access to safe and affordable drinking water to all it beneficiaries. (6.1)

### 3. Environment well-being

The project activity will result in the distribution of water purifier to households that is expected to reduce the fuelwood consumption for boiling water. It will not only reduce the amount of emissions being release in the atmosphere but also reduce the burden on forest ecosystems in and around the project are. Hence the project will contribute SDG 13 and SDG 15 in following ways:

**SDG 13.** The estimated annual emission reductions for the first activity instance is 43,129 tCO<sub>2</sub>e/year. (13.0)

**SDG 15.** The distribution of the water purifier will avoid fuel consumption and hence reduce the pressure on the forests. Due to high efficiency of project device and widespread households use, there is significant a reduction in consumption of fuel, resulting in better forest management. (15.2).

#### 2.1.2 Description of the Project Activity

The proposed project aims at improving the quality of drinking water through dissemination of low green gas emitting safe drinking water purifier (SDWP) to provide clean drinking water for households in Kingdom of Cambodia. For this reason, this proposed project activity will avoid the use of thermal energy and/or low energy and associated emissions.

The grouped project activity will minimize the use of non-renewable biomass utilized for boiling water as a means purification to achieve safe drinking water quality in the absence of this project activity. This directly leads to reduced greenhouse gas emissions. Furthermore, it can be helpful to user's health.

The project activity targets households in communities with no previous water purifiers access. The geographical boundary is in Cambodia. Water purifiers are distributed free of cost to user. Sustainability Investment Promotion and Development Joint Stock Company (SIPCO) financed the implementation of the project in full.

The scenario existing prior to the implementation of the project is the actual baseline scenario which is equal to the existing common practice by the households i.e. in absence of the project activity the equivalent amount of thermal energy generated using firewood to meet the boiling water demand.

The grouped project will distribute water purifiers to households who use woodfuel to boil drinking water. All the project instances to be included in this grouped projects will be from within Cambodia only. The project proponent aims to disseminate 26,000 water purifiers in Takeo Province, is in the first project activity instance of this grouped project. The estimates of annual average GHG emission reductions of project activity instance 1 is 43,129 tCO<sub>2</sub>e/year.



### 2.1.3 Implementation Schedule

Date	Milestone(s) in the Project's Development and Implementation
02 May 2022	Start date of the grouped project activity
31 March 2023	VCS PD is uploaded on Verra registry
13 - 15 October 2023	VCS project Validation
30 December 2023	SD Vista PD is uploaded on Verra Registry
11 February 2024 to 10 March 2024	Public comment period on Verra Registry
12-13 June 2024	On site visit for SD VISTA project validation
17 July 2024	VCS registration
30 November 2024	Expected SD Vista registration
01 May 2032	The 10-year project validation period concludes with 1,000,000 water purifiers installed

### 2.1.4 Project Proponent

<b>Organization Name</b>	Sustainability Investment Promotion and Development Joint Stock Company (SIPCO)
<b>Role in the Project</b>	Project Proponent
<b>Contact Person</b>	Ms. Nguyen Thi Hong Hanh
<b>Title</b>	Director
<b>Address</b>	6 <sup>th</sup> Floor, Hop Long Building, No.01, 59 Lang Ha Street, Ba Dinh District, Hanoi, Vietnam
<b>Telephone</b>	+84 243 519 0955
<b>Email</b>	<a href="mailto:info@carbonvietnam.com">info@carbonvietnam.com</a>

### 2.1.5 Other Entities Involved in the Project

Not applicable. At present, SIPCO is the sole entity involved in the project and no other entities involved in this grouped project.

### 2.1.6 Project Type

The project activity under consideration is a grouped project activity. The project activity instances as part of the grouped project will have following sectoral scope, project type and methodologies:

Sectoral Scope applicable to project: 03 – Energy Demand

Project type III: Other projects activities not included in Type I or Type II

Methodology: AMS-III.AV: Low greenhouse gas - emitting safe drinking water production systems, version 08.0.

### 2.1.7 Project Location

The grouped project will be hosted by Kingdom of Cambodia. The geographical coordinates of Cambodia are:

- Longitude: from 102.29 E to 107.83 E
- Latitude: from 10.41 N to 14.80 N



Figure 1: Cambodia Map

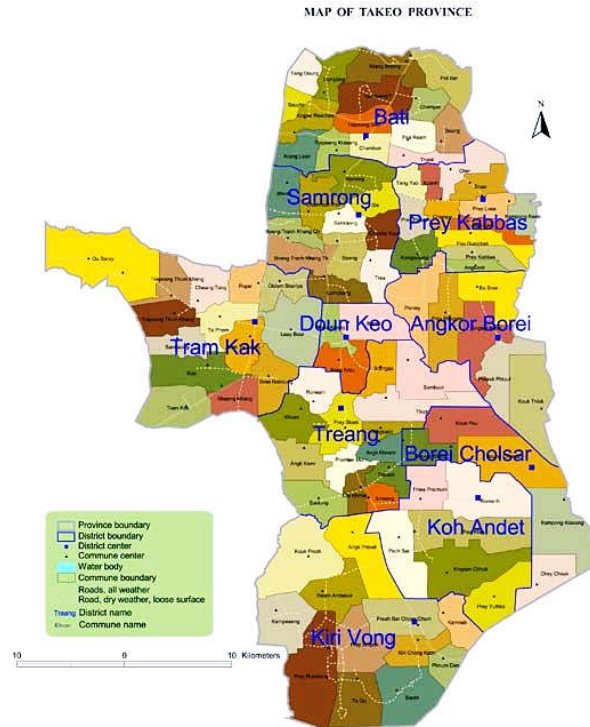


Figure 2: Takeo Province Map

Cambodia is divided into 25 provinces. To facilitate the management, implementation, monitoring and sampling stages of the project, the project proponent divides the project boundary into 4 zones.

No.	Zones	Provinces
1	North-Western	Banteay Meanchey, Oddar Meanchey, Preah Vihear, Siem Reap
2	Eastern	Kratie, Mondulkiri, Ratanakiri, Stung Treng
3	Mekong Lowlands	Kampong Cham, Kampong Chhnang, Kampong Thom, Kandal, Prey Veng, Svay Rieng, Phnom Penh, Takeo and Tboung Khmum
4	Cardomom and Elephant Mountains	Battambang, Koh Kong, Pursat, Kampong Speu, Kampot, Kep, Pailin and Preah Sihanouk

### 2.1.8 Baseline Scenario

As per the methodology AMS-III.AV (version 08.0) for a simplified and standardized approach it is assumed that fossil fuel or non-renewable biomass (NRB) is used to boil water as means of water purification in the absence of the project activity. The emissions are calculated based on the energy demand for boiling water, and in case of displacement of NRB, the baseline emissions are corrected for the fraction of the biomass that can be demonstrated to be non-renewable. Only purified water consumed for drinking purposes can be used in the baseline calculation.

In Cambodia, 27.76% the population using at least basic drinking water by 2020<sup>1</sup>. Surface water in Cambodia is often plentiful but generally of poor quality, due in part to inadequate or nonexistent sanitation in rural areas<sup>2</sup>. This leads to diarrhea and other water-borne diseases. And the most common way of treating drinking water for safer use is boiling. Based on a document of World Bank, over 90 percent of energy used for cooking comes from wood, contributing to increased deforestation<sup>3</sup>. The use of wood for burning directly leads to increase greenhouse gas emissions. Furthermore, it can affect to user's health.

The project follows AMS-III.AV: "Low greenhouse gas-emitting safe drinking water production systems", version 08.0. As this is a small-scale methodology, each the instance under the grouped project will achieve emission reductions below 60,000 tCO<sub>2</sub>e per annum. Low greenhouse gas emitting water purification systems reduce non-renewable biomass use, relative to the baseline scenario, thereby achieving emission reductions.

Sample surveys or reference literature will be used to determine the type of stoves and fuel used to boil drinking water. The weighted average by total fuel consumption shall be used if more than one type of stove/fuel is used in the project area.

The baseline scenario SDGs for this grouped project in Cambodia below:

**SDG 1:** While such a level of poverty reduction was a positive improvement, it is worth noting that many people are still vulnerable and even small and unexpected or undesirable shocks could easily cause them to fall back into poverty. Vulnerability of falling back into poverty is substantially high in Cambodia, which highlights the importance of social protection and safety nets. Future poverty reduction will also depend on Cambodia's ability to address the issue of vulnerability to poverty. Many of those who escaped extreme poverty have only just cleared the poverty line, and the poverty rate is very sensitive to small changes in the line. In this context, it is important to consider that increased consumption financed by borrowing may be masquerading as poverty reduction, and that poverty and vulnerability may be more significant than previously thought.

**SDG 3:** Achievements have been made towards reducing infant and maternal mortality, new HIV infection and AIDS related deaths, caused by other communicable and non-communicable diseases and risk factors affecting the health of the people. Maternal mortality decreased from 472 per 100,000 live births in 2005 to 170 in 2014. Likewise, infant mortality decreased from 66 per 1,000 live births in 2005 to 28 in 2014. Major expansion has been made in the number of available health centers and medical staff. The number of health centers increased from

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<sup>1</sup> <https://data.worldbank.org/indicator/SH.H2O.SMDW.ZS?locations=LA-KH>

<sup>2</sup> <https://documents1.worldbank.org/curated/en/211941468216599631/pdf/410240KH0ceramic0filters01PUBLIC1.pdf>

<sup>3</sup> <https://documents1.worldbank.org/curated/en/570931468036882999/pdf/696390ESWOP1010ECHNOLOGIESOCambodia.pdf>

1,105 centers in 2014 to 1,205 in 2018 and hospitals increased from 97 to 123. There is also better availability of private clinics and pharmacies. New HIV infections in Cambodia have steadily declined from 2015 and Cambodia has already achieved its target 90-90-90 before 2020. This has been recognized by the United Nations as one among only seven other countries. Despite progresses and improvements, the health sector still faces a number of challenges in terms of both epidemiology and the health system that require both short- and medium-term solutions.

**SDG 4:** Available data suggest Cambodia's significant progress on many fronts in the education sector (Table 3). The completion rate at primary and secondary levels, and the proportion of grade 1 students who passed through all ECE programs has increased from 80.0%, 39.0%, and 62.0% in 2015 to 86.1 %, 47.6% and 72%, respectively, in 2018. Similarly, Cambodia achieved gender parity in education sector, and is beginning to tilt in the favor of girls in recent years. The gender parity index of gross enrollment rate at both lower secondary education and upper secondary education increased from 1.1 in 2015 to 1.2 in 2018. Adult literacy rate also increased from 78.0% to 82.5% over 2015-2017. Comparing to targets set in CSDG framework, the figures suggest that all other targets, where data is available, are being attained or in some cases exceeded. This has been as a result of concerted efforts by the Ministry of Education, Youth and Sports (MOEYS) and concerned stakeholders, through the implementation of the Education Strategic Plan 2014-2018. The new National Education 2030 Roadmap for CSDG4 will build on these achievements. While continuing with the impressive progress, a number of challenges remain to be addressed including: (1) equitable and inclusive access for children to all levels of education and training (2) transition from primary to lower-secondary and high drop-out rates at the lower-secondary levels (3) quality issue from pre-primary to tertiary educators, (4) life-long learning, which is key to life-long employment and allows adoption of skills and knowledge to the structural change of the economy, is still a new concept for many people.

**SDG 5:** The National Program for Public Administrative Reform 2015-2018 incorporates mainstreaming gender issues in the civil service, which includes mandatory training and improvements in the training curriculum for new recruits, current civil servants, and senior management. Additionally, the Gender Mainstreaming Action Plan (GMAP) for the Civil Service Phase III 2014-2018 of the Ministry of Civil Service (MCS) promotes gender equality in the civil service. Gender Mainstreaming Action Groups are the mechanism for gender mainstreaming across sectors and by 2018, 30 of 31 line ministries and institutions had developed GMAPs to guide their actions. MOWA continues to promote Gender Responsive Budgeting (GRB) as a tool for gender mainstreaming across sectors and to engage with the MEF. In 2016, 28 government ministries and institutions received funds from the national budget and development partners for implementing GMAPs, an increase from 16 ministries and institutions in 2013. The budget for the Secretariat of AntiHuman Trafficking (NCCT) increased to 3,815 million riels in 2016.

**SDG 6:** Based on per capita water availability, Cambodia is not a water stressed country, but the problem is related to water quality and stability of water supply in a timely manner in both wet

season and dry season. Cambodia needs to develop water storage and delivery systems as well as capacity. Despite the RGC's effort to enhance this sector, climate change is the critical challenge affecting the surface and ground water, and ability to supply clean water to the rural people. Additionally, declining fund supported by development partners, lack of participation of women, and limited financing sources to accommodate rising demand of infrastructure investment in the rural areas are the other main challenges.

**SDG 8:** Cambodia has achieved high economic growth of around 7.0% per annum for the last two decades and attained lower middle-income status in 2015 in terms of GDP per capita, which reached USD 1,548 in 2018. The percentage of Cambodians living under the national poverty line fell around 1% per year on average, down to about 10% in 2018 from 35% in 2005. The direct contribution of travel and tourism to GDP was 12.7% in 2018, compared with 12.8% set in the target. This directly provided 620,000 jobs or 6.4% of total employment, below the target of 7%. The growth rate of online business registration and growth rate of issuing certificate of origin through the automation system in 2018 was much higher than targeted while the growth rate of online trademark registration was a little bit below the target. With substantial ongoing investment by both public and private sector, Cambodia's economy is forecasted to continue growing robustly, with further structural change in favor of industrial development, from 27.7% GDP in 2015 to 32.8% in 2018 and 38.2% in 2022. Financial services and the banking sector have been growing sharply in the past decade and more soundly in the past 4 years, as high credit growth was brought under control. There has been a boom in the construction and real estate sectors in the past few years.

**SDG 13:** The SDG 13 implementation faces the following challenges: Technological and human resource capacities to implement adaptation and mitigation solutions remain limited. Technology transfers should be promoted further; Despite recent improvements, for example with the climate change vulnerability index for communes and the 2019 GHG inventory, data availability remains a challenge, and capacities of sectors to analyze vulnerabilities and track climate change adaptation and mitigation need to be strengthened; Better evidence and research on how climate change impacts various vulnerable groups is required to improve the design and targeting of climate change programs; Financial support from developed countries (UNFCCC Annex 1 countries) for climate change priorities identified by Cambodia is insufficient. Better alignment of international assistance with national priorities is required. Access to finance for climate-smart investments is still limited for the private sector. Adequate financing instruments should be developed, linked with awareness campaigns and dissemination of climate-smart technologies.

**SDG 15:** Limited capacity for implementing and coordinating works related to forest land, water and forest protection is the major challenge. Moreover, climate change, urbanization and industrialization are currently negatively affecting the country's natural resources as well as its ecological system. In order to improve this, the RGC will increase afforestation to improve forest coverage. The availability of budget and facilities for implementing activities related to climate

change, green growth and biodiversity protection is insufficient. Also, the policies and laws to ensure the sustainability of natural resources and environment do not sufficiently respond to today's needs. In addition, the institutional capacity to coordinate and harmonize policies, legal documents, strategic plans, and action plans remains an issue. Population growth is also a challenge for sustainable forest conservation. Related to climate change, there is a lack of participation from both the public and private sectors for sustainable development.

### 2.1.9 Causal Chain(s)

See appendix A for Causal Chain image.

### 2.1.10 Threats to the Project

There are the other two types of potential threats to the grouped project including human and natural-induced threats as follows:

#### **Human-induced threat:**

Threat 01: Many households think that boiling water is seen to be safer to consume than water straight from water purifier of the project.

Solution: The project proponent and Cambodian Women for Peace and Development (CWPD) will explain that the nano silver technology and ceramic filter have been used in some countries such as Laos, Viet Nam in order to provide drinking water for people who cannot access this resource. Each water purifiers in the grouped project must achieve water quality for microbes defined in Drinking Water Quality Standards.

Threat 02: Households may not want to accept water purifiers.

Solution: SIPCO and CWPD will conduct survey and statistic households (end-users) in need of receiving water purifier. The target end-users will be chosen carefully to avoid this problem. Only the households do not have conditions to access safe water system and must to use biomass woody to boil water. The project proponent and partner will do research on the reason why some households do not want to use water purifiers if it happens. Moreover, SIPCO would conduct trainings, they can easily understand the benefits of water purifiers, such as people can drink cleaner water, the reduction of air pollution and cost on firewood. Households accepting water purifiers will share their experiences in the training to encourage higher usage rate.

#### **Nature-Induced threats:**

Threat 01: The unsafe drinking water malfunctions as a consequence of lack of maintenance.

Solution: SIPCO through CWPD to jointly distribute water purifiers to households. The CWPD network from district to commune to village level which will receive any comments from end-users in using water purifiers. They are responsible on behalf of SIPCO will continually visit households to check the functioning of device. Moreover, if there is any abnormal detection, household representative can contact to SIPCO by number phone, which is on water purifiers.

### 2.1.11 Benefit Permanence

The project activity helps in achieving following co-benefits, which will contribute in sustainable development in host country.

#### 1. Environmental sustainability:

- The project will help significantly reduce greenhouse gas emissions over its lifetime.
- The project will help reduce the use of non-renewable biomass from forests, assisting the maintenance of existing forest stock, protecting natural forest eco-systems and wildlife habitats.
- The protection of standing forests will ensure the maintenance of watersheds that regulate water table levels and prevent flash flooding.

#### 2. Social benefits

- Purchasing or collecting firewood to boil the water constitutes a significant expense for the very poorest households and communities. The project will provide access to clean drinking water, which will reduce the cost for families and thereby improve attendance at households, increase productivity, and more generally give a sense of hope and opportunity.
- Micro-entrepreneurs: low greenhouse gas emitting water purification technologies offer scope for micro-entrepreneurs (Distributors/Installers), thereby creating jobs and supporting families.
- There is a direct incentive to ensure that the projects (instance) have a successful long-term operation as this will ensure continued SDWP.
- Polluted indoor air due to open and uncontrolled combustion is a huge health concern. Low greenhouse gas emitting water disinfection technologies tackle this problem by reducing the combustion of wood fuel.
- The project will alleviate the work burden of women and children as they have to spend less time to collect firewood for boiling water.

#### 3. Economic benefits

- The project activity will help develop a section of Cambodia rural economy through the installation and maintenance of SDWPs, as well as work related to monitoring of the carbon registration activity.

The construction and implementation have created of job opportunities to water purifier manufacture. It has trained skilled workers for industry which will benefit both themselves even after the project activities have finished. The proposed project will deliver a long term, secure and simple contribution to sustainable development in Cambodia that would not exist without carbon finance. Moreover, the project will also have long-term positive influences on the health of end-users, especially the women and girls who mainly in charge of cooking in the households through the reduce of air pollution. Also, the forest saved by the project activity will protect the environment and biodiversity for a long time.

The project proponent has committed to the following long-term goals in order to guarantee the



project's long-term sustainability, the water purifier's permanence, and other program benefits:

- During distribution campaigns at commune committee, SIPCO and/or partners (CWPD) organize comprehensive communications and training on the benefits of project device for community health and the environment. An understanding of these overall benefits to stakeholders and end-users shall go a long way in ensuring the long-term sustainability of the grouped project activities and achievement of project outcome objectives.
- After the grouped project activities have ceased, continuous check on end-users to ensure the continued use of water purifier to guarantee this, implementation team and SIPCO partner shall conduct year-round audits. If project device produces unsafe drinking water, SIPCO will sell subsidized cores for only 3.5\$/core and send it to the household to ensure the water purifier continues to be used.

## 2.2 Stakeholder Engagement

### 2.2.1 Stakeholder Identification

The process of identifying stakeholders involves categorizing individuals or groups who are expected to have a direct or indirect impact on the project or those who have an interest in it.

SIPCO identifies the relevant stakeholders via 3 steps who are associated throughout the grouped project lifetime. The steps are illustrated like as:

1. Identification of the advantages and co-advantages from the groped project activities
2. Identification of stakeholders classes based on the grouped project cycle stages
  - Project ideation
  - Project development
  - Project implementation
  - Project validation
  - Project verification
3. Make the stakeholder category and determine direct/indirect effects based on stakeholder classes.

Creating a logic framework model for the planned project is the first step in classifying activities according to the expected and unintended effects of those actions. In order to identify possible stakeholders at various phases of the project cycle, this step will involve identifying benefits and co-benefits matched with the project activity.

Then, based on the stage of the grouped project to determent stakeholder classed associated. The different stages of the grouped project considered for stakeholder identification are:

- Project ideation: Stakeholders could include academic institutions, self-help organizations, and local officials who can assist the project promoter in gaining traction in the community.
- Project development: government authorities, NGOs, community development, investors would be stakeholders at this stage
- Project implementation: end-user, distribution partners, water purifier manufactures, would be the stakeholders during implementation stage.
- Project validation and verification: surveyors, distribution partners, ... could be some of the main stakeholders during this stage.

Finally, SIPCO identifies stakeholders under two classes: direct affected parties and indirect affected parties. A detailed description of these classes is defined in section 2.2.2.

They are defined as:

**Direct stakeholders:** There are the ones or grouped who are directly impacted by the project activity. Such as end-users, water purifier manufacturer, *distribution partner (CWPD)*, ....

**Indirect stakeholders:** Individual or grouped are indirectly impacted such as Government authorities, local NGOs, ...

SIPCO will also identify anybody who is interested in the project and invite them to participate. SIPCO has extended an invitation to CWDP to participate in the decision-making process about the project. Non-governmental organizations (NGOs) in the local area that are working on issues that are pertinent to the project are also stakeholders.

### 2.2.2 Stakeholder Description

Stakeholder Category	Direct/indirect affected	Relevance to the project activity
End-users	Direct	End-users are directly affected by the project would typically be local people, communities and or representatives who are directly or indirectly affected by the project or may have an interest in the project.
CWPD	Direct	the structure of CWPD vertical linkage from district to communes to village level, its broad membership base and ongoing meetings and activities facilitate project promotion and implementation. CWPD's role in

		the project activity included information dissemination, conducting several surveys, logistic support for scheduling distribution, water purifiers distribution, monitoring the water purifier quality.
Government authorities	Indirect	The project is expected to have indirect benefits for government authorities by improving the livelihoods of the people in the project area and reducing deforestation, thereby promoting overall development and better living conditions in the region.
Local NGOs	Indirect	The PP worked in close collaboration with local nongovernmental organizations (NGOs) to carry out and oversee the activities of the project.
WP manufacturers	Direct	The maker of water purifiers products benefit from the initiative, since it enables them to increase their income from the sale of water purifiers
Local Vendor	Direct	Various local businesses supply firewood in the project area. Project activity helps save wood in boiling so influence consumption of these products and could thus negatively affect local vendor.

### 2.2.3 Stakeholder Consultation

#### Procedure followed to invite stakeholder comments

An invitation letter was sent to related local stakeholders including DNA Cambodia, Government Authorities, NGOs, project developers, manufactures, distribution partner (Cambodian Women for Peace and Development), households in 01 April 2022 in order to inform about the local stakeholder consultation meeting conducting in 02 May 2022 at at meeting room in Takeo provincial administration, Takeo People's Committee. We also email and made the phone call to all invited local stakeholders for cleaner clarification on the project and getting the confirmation

of the meeting attendance. Stakeholders were identified as those whose activities directly or indirectly impacted by the project activities. The invitations were welcoming written comments as well as physical attendance. The consultation was held for the Grouped Projects for Cambodia Water Purifier.

Mr. Pham Ngoc Nhan, project director, made a presentation on the social, economic and environmental impacts of the project activity to local communities. The project activity aims to distribute freely 1,000,000 water purifiers all over Cambodia to households in which using traditional cookstove boiling drinking water. Mr. Pham Ngoc Nhan as well as a brief introduction of VCS projects.

Each attendee was handed out feedback form, project description presentation therefore, their comment could be collected directly in the meeting or in other hand sent to CME via email within 10 days after the date of the local stakeholder meeting.

Stakeholder engagement is an ongoing and steadily improving process. SIPCO is constantly engaging with their local community through casual conversations with stakeholders and beneficiaries visits of CWPD. SIPCO team's integration into the community has enabled them to gain valuable feedback.

The consultation activities are as follows:

<b>Stakeholder group</b>	<b>Stakeholder</b>	<b>Consultation activities</b>
Affected Parties	End-user	- Household visit/surveys - Public events - Open office
	CWPD	- Open communication with implementation partner - Annual report - Training activity
	Water purifier manufacturer	- Training activity
	Local vender	- Public events
Indirectly affected parties	Local NGOs	- Public events - SIPCO website, email and phone
	Government authorities	- Public events - SIPCO website, email and phone

Program of the public

Date of meeting: 2<sup>nd</sup> May, 2022

Place: at meeting room in Takeo provincial administration, Takeo People's Committee.

Language: English and Khmer

**Meeting procedure:**

- Introduction: Stakeholders, Project Developers
- Context and objectives of public consultation
- Presentation of Project
- Water purifier
- Brief about the project and its components (including cost, risk and benefits)
- Video Spot Projection
- Modalities of distribution and use
- Environment and socio-economic Impacts
- Grievance mechanism
- Transfer of ownership of credits
- Questions and answers with participants
- Conclusion/ Cocktail

**Stakeholder Comments**

After listening Mr. Hoang Anh Dung, a chairman of SIPCO made presentation on the project activity and the social, economic and environmental impacts to communities, Stakeholders have clearly understood the operation one. Also, All the potential costs, risks and benefits were communicated with the local stakeholders during the stakeholder consultation meeting. The grouped project of free distribution of water purifiers to households who do not access safe drinking water so all stakeholder welcomed. The project activities will bring many benefits to households, especially in remote areas, difficult areas.

All stakeholders supported the project activities without negative comments.

At the end of the meeting, the contact details of SIPCO have been shared with the participants to ensure on-going communication with the stakeholders.

#### 2.2.4 Continued Consultation and Adaptive Management

Consultation will be continued throughout the grouped project lifetime. Adaptations will be made if deemed necessary.

SIPCO through CWPD to jointly distribute water purifiers to households. The CWPD network includes in province and district level which will receive any comments from households in using water purifier. After that, CWPD will immediately report to SIPCO.

Households can send any comments directly to SIPCO through telephone, email or letters.

**Following details have been communicated to participants:**

- Company name: Sustainability Investment Promotion and Development Joint Stock Company
- Address: 6<sup>th</sup> Floor, Hop Long Building, No.1, 59 Lang Ha Street, Ba Dinh District, Hanoi, Viet Nam
- Telephone: +84 243 519 0955
- Email: info@carbonvietnam.com

They can also use our website ( <https://carbonvietnam.com/> ) to submit any comment. And all information about the grouped project can be found in this website.

### 2.2.5 Anti-Discrimination

SIPCO will distribute water purifiers to households where do not access clean water system and use traditional low efficiency boiling solutions without distinction in genders, races, religions, educational backgrounds or any other aspects. Manufactures cooperated with SIPCO also dedicate to the elimination of discrimination. They need more employees to implement the project. SIPCO and they will make sure that women, persons with disabilities, and minority will have equal chance to get the jobs. The same is also governed by government policies and any such discrimination will have considered a punishable offence in the host country. Cambodia is also party to the “Convention on the Elimination of All Forms of Discrimination against Women” and the project has aligned its labour policies with the same.

### 2.2.6 Worker Training

For a grouped project to be successfully implemented, there must be a large number of workers available to take part in the production, distribution, or surveys, monitoring. With training provided by the project proponent, they will acquire skills that are pertinent to the job as well as education in sustainable development and global citizenship. Workers will get training in areas such as management structure, rules, and worker rights in addition to training in technical skills.

SIPCO’s staffs in Cambodia delivers instruction in the local language, taking into account marginalized and vulnerable groups that may lack English proficiency. Furthermore, PP guarantees that a local representative is present at all training sessions in order to reduce communication gaps and make locals feel at ease. This improves engagement between end users and PP since end users feel comfortable discussing their questions and concerns regarding the project. Additionally, project papers, including a non-technical overview, have been made available in local language to all stakeholders, especially disadvantaged and vulnerable groups, via distribution agencies/implementing partners.

### 2.2.7 Equal Work Opportunities

SIPCO is committed to ensuring that all stakeholders, regardless of their genders, colors, faiths, educational backgrounds, or any other factors, will be given an equal chance to fill all job positions. This commitment will be fulfilled by providing equal access to employment opportunities. Before any full-time or part-time employees for the project are hired, the project proponent will advertise applicable employment opportunities by contacting village heads and posting announcements on local notice boards seeking potential candidates for the positions. Also, the initiative will encourage women, people with disabilities, and members of underrepresented groups to apply for the positions.

### 2.2.8 Workers' Rights

Each of our workers has a contract that states his/her rights and obligations. In Cambodia, the labor laws favor the employee and reputable organizations work hard to comply with these laws, which are enforced by the Ministry of Labor and Vocational Training.

Cambodia, the host country is also a member of the Core Labour Conventions of the International Labour Organization (ILO) convention since 1969 and has been implementing various programs, in collaboration with government, workers and employers' organizations.

Social dialogue is defined by the ILO to include all types of negotiation, consultation or simply exchange of information between, or among, representatives of governments, employers, and workers, on issues of common interest relating to economic and social policy. Below citations provide for the establishment of the Labor codes general labour and employment acts, wages, labour inspection, labour statistics and conditions of work<sup>4</sup>:

- KHM-1997-L-46560: Royal Kram CS/RKM/0397/01 promulgating the Labour Law
- KHM-2016-R-103416: Joint Prakas on Fines for Violators of the Labour Law (MoLVT and MoEF No. 659 of 2016)
- KHM-2020-R-110689: Instructions No. 045/20 On Employment Contract Suspension and Suspension of NSSF Contribution Payment for Factories, Enterprises, Establishments in the Garment and Tourism Sectors Severely Affected by Covid-19 (MoLVT No: 045/20 K.B/S.N.N.Kh.L)
- KHM-2020-R-110686: Prakas on the Determination of the Minimum Wage for Workers/Employees in the Textile, Garment, Footwear, Industries for 2021 (No. 303/20)
- KHM-2007-L-86084: Royal Kram No. 0707-020 on the amendments of Articles 139 and 144 of the Labour Law

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<sup>4</sup> <https://natlex.ilo.org/dyn/natlex2/r/natlex/fe/home>

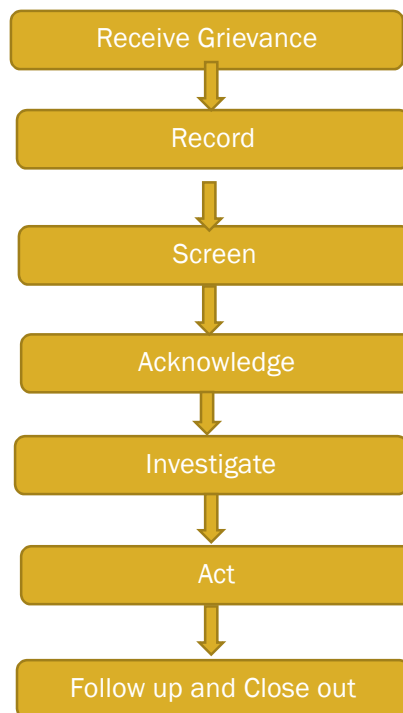
### 2.2.9 Occupational Safety Assessment

The grouped project activity will not entail any extraordinary risk. Risks could stem from road accidents, or minor social disputes during delivery and demonstration activities. Risks will be minimized by informing the workers about them, and by properly training workers with best practices and providing adequate tools/equipment. The worker training, orientation and training refreshment courses will consist of verbally informing them of these risks and about how to minimize them.

### 2.2.10 Feedback and Grievance Redress Procedure

Project proponent has established a grievance mechanism in the project area which has been explained to the stakeholders during stakeholder meetings and the project implementation progress. The stakeholders affected by the project can express any complaint. Any grievances could send to SIPCO email address. For online form, stakeholders can complete a grievance form located on SIPCO website: [www.carbonvietnam.com](http://www.carbonvietnam.com). The grievances received are addressed according to their merit. In case of any conflict, the grievance is escalated to the senior management of project proponent for resolution.

The grievance mechanism process could be illustrated as below:



- Receive Grievance

The grievance could be received by all means, such as in person/over the phone, via email/website,

- Record

All formal grievances will be logged in the External Grievance Register and Grievance Lodgment Forms will be saved for record of correspondence.



- Screen

The stakeholder contact officer is responsible for assigning a grievance owner to liaise with the external stakeholders and work on a resolution. Grievances will be screened depending the level of severity in order to determine who the grievance owner will be and how the grievance is approached.

- Acknowledge

A grievance will be acknowledged, the grievance owner, within two working days of a grievance being submitted. Communication will be made either verbally or in written form.

The acknowledgement of a grievance should include a summary of the grievance, method that will be taken to resolve the grievance and an estimated timeframe in which the grievance will be resolved. If required, the acknowledgement provides an opportunity to ask for any additional information or to clarify any issues.

- Investigate

The grievance owner is responsible for investigating the grievance. The investigation may require the grievance owner to make site visits, consult employees, contact external stakeholders and complete other activities. Records of meetings, discussions and activities all need to be recorded during the investigation. Information gathered during the investigation will be analysed and will assist in determining how the grievance is handled and what steps need to be taken in order to resolve the grievance.

- Act

Following the investigation, the grievance owner will use the findings to create an action plan outlining steps to be taken in order to resolve the grievance. The grievance owner is responsible for assigning actions, monitoring actions undertaken and making sure deadlines are adhered to. Once all actions have been completed and the grievance owner feels the grievance has been resolved, they will then formally advise the external stakeholder via their preferred method of contact.

- Follow up and close out

The grievance owner will make contact with the external stakeholder/s three weeks after the grievance is resolved. When contacting the external stakeholder, the grievance owner will verify that the outcome was satisfied and also gather any feedback on the grievance process.

Minutes of the meeting will be recorded and saved.

If required the grievance owner may need to follow up with the external stakeholder on numerous occasions to confirm all parties are satisfied.

## 2.2.11 Feedback and Grievance Redress Procedure Accessibility

On the websites of the project participant and, if relevant, the local representative, information on the grievance and feedback procedures shall be made public and will be available to all project stakeholders. Besides, households also sent comment to CWPD which is a parent of PP.

### 2.2.12 Stakeholder Access to Project Documentation

All the project related documents is maintained with SIPCO at office in the host country which is accessible to all the stakeholders associated with the project, especially end-users. Reviewing the project documents are very difficult to end user to comprehend, a summary detailing about the project activities and its outcomes are also available with the distribution partner (CWPD) as well as at the office of SIPCO. During the distribution of the project ICSs, the project details were explained and stakeholders were requested to give their feedback on any concern related to project. The project documentation will be uploaded on VERRA website and the same has been informed to stakeholders. The details on project have also been shared with them during stakeholder consultation. Further, SIPCO 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 website by providing them verbal communication.

### 2.2.13 Information to Stakeholders on Assessment Process

SIPCO and partner inform households that they are participating in a project, which distributes water purifiers free of cost to improve the quality drinking water, the household economy and the environment. They are informed in advanced that the use of water purifier generates carbon credits which in turn are used to cover the cost of water purifiers. Before auditors conduct site visits, households will be contacted several days in advance either by telephone or in person, and they will be given the option to attend the visit.

We have previously declared our involvement in the SD VISta's project through on our website, and the initiative is continuing to go forward at this time. During the surveys that are aimed to gather data for monitoring the usage of the SDWP and its advantages, the users will be consulted to give the data for monitoring parameter. Additionally, the users will be asked to submit the data.

## 2.3 Project Management

### 2.3.1 Avoidance of Corruption

SIPCO has procedures in place to educate both management and staff on the need of adhering to a code of conduct and maintaining high ethical standards in business. To guarantee that the organization is managed in accordance with all of the legal requirements and is held to the highest standards of operation, the whole project crew, including corporate management, is responsible for implementing and adhering to these rules.

SIPCO and implementing partners are committed to combating any form of corruption, bribery, embezzlement, fraud, favouritism, cronyism, nepotism, extortion, and collusion. SIPCO's employees sign a code of business ethics and conduct form provided to them in the employees' 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. SIPCO's implementation partners are

required to review SIPCO'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

The grouped project activity involves distribution of water purifier to households only and it will not involve and land use or acquisition.

### 2.3.3 Recognition of Property Rights

SIPCO distributes water purifier to individual households free of charge. The property right of water purifier belongs to end-users while that of carbon credits generated from the project belongs to SIPCO. The end-users will sign donation and carbon transfer agreements with SIPCO when they receive ICSs to confirm the property rights of SIPCO and carbon credits.

### 2.3.4 Free, Prior and Informed Consent

The project is voluntarily implemented by SIPCO and local distribution partner (CWPD), and end-users are free to choose whether they take part in the project or not. Free, prior, and informed consent takes place before distribution through signing of the donation and carbon transfer agreements when the end-users receive the water purifiers, which clarify the property rights of the water purifiers and the carbon credits generated from the project.

### 2.3.5 Restitution and/or Compensation for Affected Resources

The project activity involves distribution of water purifier to individual households only and it will not affect any resources.

### 2.3.6 Property Rights Removal/Relocation of Property Rights Holders

The project activity involves distribution of water purifiers to individual households only and it will not lead to any removal of property rights or relocation of property rights holders.

### 2.3.7 Identification of Illegal Activities

Theft and corruption may be identified during the implementation of the project. SIPCO and its local partner will avoid any corruption as per Section 2.3.1 of this document. End-users will be reminded to keep their water purifier in safe places to reduce theft when they receive the water purifier.

### 2.3.8 Ongoing Conflicts or Disputes

The grouped project activity involves distribution of water purifier to households. There are no ongoing or unresolved conflicts or disputes over rights to lands, territories and resources and any disputes that were resolved during the last twenty years.

### 2.3.9 National and Local Laws and Regulations

The project activities under the grouped project are voluntarily coordinated action Sustainability Investment Promotion and Development Joint Stock Company. There is no mandatory law or requirement in Cambodia to foster the dissemination of water purifiers. There are no national laws or regulations in Cambodia that would restrict the implementation of any of these alternative project activities. Therefore, all alternative scenarios considered are in compliance with mandatory regulations.

There are two central policies and regulation in Cambodia. Drinking Water Standard Enacted in 2004 by the Council of Ministers<sup>5</sup>, defining the standards of safe drinking water in line with the WHO guidance, and the National Policy on Water Supply and Sanitation<sup>6</sup> enacted on 7 February 2003. The National Policy is intended to promote the people's quality of daily living and welfare. Sufficient water supply and sanitation services with low costs as well as using a sustainable, and environmentally friendly sanitation system, are clearly identified as barriers to these objectives national wide.

The National Policy on Water Supply and Sanitation is composed of three main sections:

1. Clean water supply policy for provinces, cities and town.
2. Sanitation policy for provinces, cities and town areas.
3. Clean water supply and sanitation in rural areas.

1. Clean water supply policy for provinces, cities, and town: aims at finding out an appropriate solution within the water supply development in order to ensure the sustainability of service as well as to provide opportunities for poor people. This section has six chapters namely: (i) methodologies of clean water supply; (ii) private sector participation; (iii) price of water consumption; (iv) protection and support for the poor people; (v) autonomy of public services; and (vi) clean water regulators.

2. Sanitation policy for provinces, cities and town areas: aims at ensuring the effectiveness and sustainability of investment, processing of sanitation system, especially, installed facilities. The section has six chapters namely: (i) investing achievement; (ii) technological selection; (iii) finance and budget collection; (iv) sanitation system management; (v) services and private participation; and (vi) service expanding to poverty people.

3. Clean water supply and sanitation in rural areas: has objectives to (a) facilitate the implementation of this policy for all stakeholders; (b) identify the development priority within water supply and rural sanitation as well as long-term sustainability; (c) create the most appropriate methodology to support the programme/initiative aiming for clean water supply and rural sanitation; and (d) deliver the services to people. This section is also composed of six

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<sup>5</sup> WEPA (Water Environment Partnership in Asia) (2004) *Drinking Water Standard*. [Online] Available from: <http://www.wepadb.net/policies/law/cambodia/07.htm>

<sup>6</sup> WEPA (Water Environment Partnership in Asia) (2003) *National Policy on Water Supply and Sanitation*. [Online] Available from: <http://www.wepa-db.net/policies/law/cambodia/05.htm>

chapters: (i) view point of clean water supply and rural sanitation; (ii) duties and responsibilities; (iii) planning; (iv) standards; (v) private participation; and (vi) control and evaluation

**The project complies with all government regulation, specifically concerning the supply of clean water in rural areas and urban areas whilst providing “opportunities for poor people” who can access the technology, both physically and financially. The Cambodian Ministry of Health has been involved, consulted since the very start of SDWP in Cambodia**

### 2.3.10 Project Ownership

The ownership of carbon credits is the exclusivity with Sustainability Investment Promotion and Development Joint Stock Company (SIPCO), SIPCO is the coordinating & Managing Entity of the grouped project, the ownership of carbon credits shall be demonstrated through following indicative information:

- SIPCO purchases water purifiers directly from the manufacturer named Viet Charcoal Production Company Limited. The water purifier purchased contract shall be signed between the two parties for each project activity instance in this grouped project. Every contract will be attached with a statement or/and a beneficial agreement between the project owner (SIPCO) and the manufacturer, the statement or/and beneficial agreement is to confirm that all carbon credits right from the purchased water purifiers for the project activity shall be remained to the project owner without affected result with manufacturer.
- The ownership of carbon credits also is demonstrated through a beneficial agreement between the project owner, SIPCO, and the target households where get a free distributed water purifiers as the end user, the beneficial agreement shall confirm that the end user shall irrevocably transfer all rights to any Carbon Credits that may be generated by the operation of the water purifier to SIPCO, and to take all reasonable steps to affect such transfer; the target households irrevocably waive any rights to Carbon Credit in exchange for the free supply of the water purifier.

Therefore, the ownership of SIPCO achieves via enforceable and irrevocable agreement with the holder of the property (household) and contractual right in equipment (water purifier) with the manufacturers that generates GHG emission reductions and/or removals which vests project ownership in the project proponent.

### 2.3.11 Grouped Projects

The project is a grouped project, therefore for each new instance the following eligibility criteria are to be confirmed:

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 Section 2.1.2 and will be implemented directly with beneficiaries of water purifier, extending benefits and reinforcing project water purifier adoption
2	Where appropriate, meet the applicability conditions of the SD VISta asset methodology applied to a project	Instances under grouped project do not apply for SD Vista assets. Therefore this criterion is not applicable
3	Are subject to the same scenarios at the project start with respect to stakeholders' wellbeing 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 instances only within Cambodia will have the same baseline scenario described in section 2.1.8, which was available during the start of project. Also, the instances will be designed to maximise the intended impact and preserve well-being with monitoring and ongoing stakeholder consultation to ensure.
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 instances only within Cambodia will have the same scenario with respect to natural capital and ecosystem services as determined in the baseline scenario. All the new instances will also have households relying on water purifiers for meeting their daily using demands.
5	Are subject to the same processes for stakeholder engagement described in the project description	All of new instances under the grouped project will be detailed during continuous stakeholder consultations, refresher trainings for Implementing Partners and feedback consider in secondary project activity design to maximise the intended impact and preserve wellbeing
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.	New instances within the grouped project will be implemented only when the PP has received the authorization from the municipality for the availability vacant land in the villages and has signed the agreement with the mayor of the municipality
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

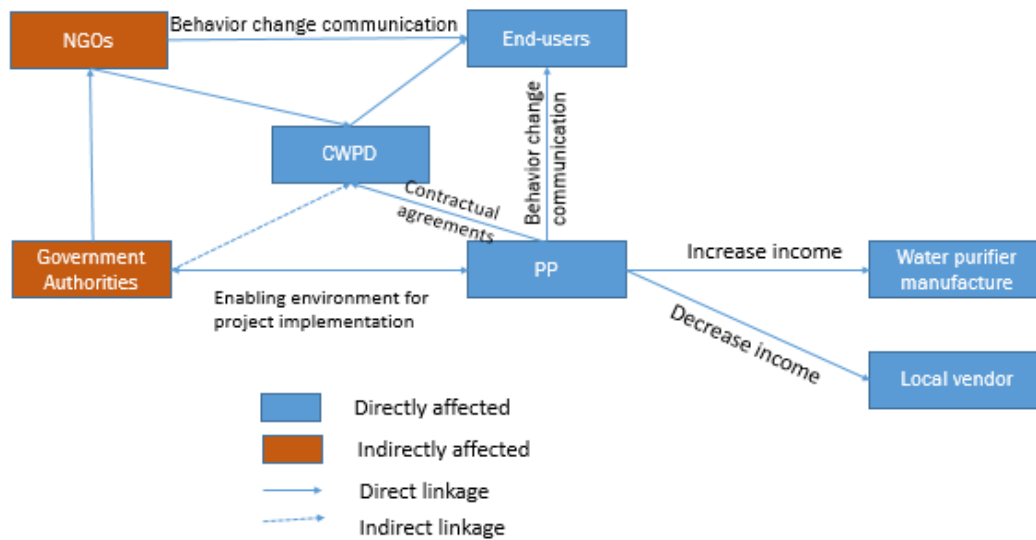
## 3 BENEFITS FOR PEOPLE AND PROSPERITY

### 3.1 Condition of Stakeholders at Project Start

Stakeholder category	Description	Condition at project start
End-user	Beneficiaries of installing water purifiers in the project areas	1. Not access to safe drinking water 2. Lack of knowledge about benefits of water purifier
Water purifier manufacturer	The partner produces water purifier to provide for the grouped project activity	When the project proponent decided to invest in the project, PP signed the contract agreement with water purifier manufacture. They have prepared enough materials, worker, facilities to produce a sufficient number of purifiers for the project activity as PP request.
CWPD	Formal and informal groups that work towards improvement of women live	Less employment opportunities
Local Vendors	Various local businesses supply wood in the project area	Local vendors interact with current and potential beneficiaries daily. Their work is dependent on business from local community members
Local NGOs	Various other NGOs in Cambodia provide services to SIPCO beneficiary base	In the past, these organizations have suggested possible recipients to us and offer charitable services geared towards members who are more disadvantaged.

Government authorities	Environment benefits due to use of water purifier to avoid boiling drinking water	<ol style="list-style-type: none"> <li>1. High use of firewood</li> <li>2. High greenhouse gas emissions</li> <li>3. High risk of logging in the forest</li> </ol>
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Interactions between/with the stakeholders:



End users who are direct end-users are considered the most important stakeholders in the entire interaction matrix. The project proponent (PP) is directly/indirectly linked with all stakeholders, especially the end-users, with the aim of creating behavioral change by distributing water purifiers in rural communities. PP links with distribution partner (CWPDP) through contractual agreements to implement the project and ultimately lead to project implementation and development. Furthermore, PP cooperates with local authorities to create a favorable environment for project implementation. NGOs along with local authorities play an important role in creating a supportive environment for project development and promotion, thereby increasing the adoption of project kitchens. PP links directly with water purifier manufacturers creating additional income for these units.



### 3.2 Expected Impacts on Stakeholders

<b>Impact #1</b>	Access to safe drinking water
<b>Type of Impact</b>	Positive, actual, direct
<b>Affected Stakeholder Group(s)</b>	End-user (households)
<b>Resulting Change in Well-being</b>	Less reliance on wood fuel to meet equivalent thermal energy needs for boiling water purposes, freeing up time/money, health benefits from reduced smoke in kitchen and surround atmosphere and drinking safe water

<b>Impact #2</b>	Improve health status
<b>Type of Impact</b>	Positive, predicted, direct
<b>Affected Stakeholder Group(s)</b>	End-user
<b>Resulting Change in Well-being</b>	<p>Resulting Change in Well-being. Water purifier provides for the improved health outcomes:</p> <ul style="list-style-type: none"> <li>• Lowered risk of developing Chronic Obstructive Pulmonary Disease (COPD) or worsening COPD due to using cookstove to boil drinking water</li> <li>• Accessing safe drinking water helps preventable illness related to digestive system such as diarrhea, cholera, dysentery, typhoid fever</li> <li>• Improved overall respiratory health</li> </ul>

<b>Impact #3</b>	Improve time and safety women and children
<b>Type of Impact</b>	Positive, predicted, directed
<b>Affected Stakeholder Group(s)</b>	End-user
<b>Resulting Change in Well-being</b>	Through drinking directly from water purifier of the project offers a viable pathway for women empowerment (i.e. saving time correct woodfuel and boiling water).

<b>Impact #4</b>	Improved learning
<b>Type of Impact</b>	Positive, predicted, directed
<b>Affected Stakeholder Group(s)</b>	End-users
<b>Resulting Change in Well-being</b>	Reduce the time spent on firewood collection and boiling for children, they have more time to educate

<b>Impact #5</b>	Improved Economic Outcomes
<b>Type of Impact</b>	Positive, predicted, directed
<b>Affected Stakeholder Group(s)</b>	End-users
<b>Resulting Change in Well-being</b>	Households would save financial to buy firewood when using traditional cookstove to boil drinking water. Moreover, reduced time to collect woodfuel and boil drinking water, cooks have time to make money.

<b>Impact #6</b>	Create job opportunities
<b>Type of Impact</b>	Positive, predicted, directed
<b>Affected Stakeholder Group(s)</b>	Implementing partners, employees
<b>Resulting Change in Well-being</b>	<ul style="list-style-type: none"> <li>• It will recruit more people to increase the production of water purifiers for the project.</li> <li>• Throughout the period of time that the project is being credited for, the project proponent and its local partners will be in charge of the maintenance and monitoring plan, which is required to also employ local people.</li> </ul>

<b>Impact #7</b>	Training imparted on climate change, project implementation and monitoring procedures
<b>Type of Impact</b>	Positive, predicted, directed
<b>Affected Stakeholder Group(s)</b>	Village community, End-users, distribution partner staff
<b>Resulting Change in Well-being</b>	Numerous stakeholder groups will receive training and skill development related to community engagement, survey and monitoring conduct, which is intended to empower their lives by raising awareness of social equity and climate change-related issues as well as ensuring long-term employability.

<b>Impact #8</b>	Decrease in income of woodfuel supplier
<b>Type of Impact</b>	Negative, predicted, directed
<b>Affected Stakeholder Group(s)</b>	Local vender
<b>Resulting Change in Well-being</b>	There remains the possibility that if enough community members begin to use water purifier so that they can directly drinking water without boiling as the baseline scenario, the reduction in wood consumed would reduce the need for wood causing some vendors to leave the profession. As SIPCO will provide more job opportunities the more water purifiers are installed, this negative impact will be mitigated by the provision of new job opportunities as water purifier installers within the organization of SIPCO

### 3.3 Stakeholder Monitoring Plan

This project takes use of the opportunity presented by the installation of water purifiers to generate a net positive effect on the overall well-being of the households who the project is being carried out. In order to establish the influence that the project will have on each of the major stakeholders, monitoring procedures are utilized. Interviews, questionnaires, face-to-face observations, focus groups, and other job, financial, and health profiles are all planned to be used as data collection methods for this project. The major data that the CWPD uses is gathered via ongoing visits to houses and interviews with residents. When the SDWP has been installed, it will be their responsibility to monitor any modifications that occur. Group talks and individual interviews will both be conducted on the same topic by the supervisors of the field teams. The

information gleaned from these exchanges will be compiled into reports, which will then be sent to senior analysts.

**Identification and sensitization visit**

Before the implementation of the project, staff and partners of SIPCO (CWPD) should conduct a one-time identification and sensitive visit to local villages. partners identify and visit households relevant to project activities. In discussions with stakeholders, they explain the project and its benefits to health, nutrition and climate change. Any questions raised are recorded and responded to. After the project plan was accepted, a community-wide training session was held to introduce the project to all interested households. The training includes information on many interests and how they can be involved in the project.

**Distribution visit**

The water purifiers of grouped project are made by a local manufacturer, which are portable and easily to use. When distributing WPs to households, technicians explain how to use and maintain WPs. Staff of SIPCO and partner will respond to any doubts.

**Checking visit**

After distributing, SIPCO and/or partner will conduct random visits with households. This is the most critical visit because during this time that frustration with WP may arise. The staff will help households the adaptation, provide support to non-teaching staff who is in charge of preparing drinking water and solve emerging problems. Comment from them will be collected. SIPCO and partners will analyze these feedbacks and improve the project activity accordingly when applicable, increasing the adaptation of the households to the project.

**Verification visit**

During each period of the grouped project verification, SIPCO and partners will conduct a random sampling survey with the requirements of standard and guideline of “Sampling and surveys for CDM project activities and programme of activities” (version 04.0). Households using experience and WP condition will be monitored and recorded in the questionnaires.

Stakeholder grouped impacted	SDG Indicator	Monitoring parameter	Monitoring Approach	Sampling	Monitoring Frequency						
End user	1.4	Number of households received water purifier as an access to clean fuel and technology	Net benefit SDG 1 = $N_{\text{project}} - N_{\text{baseline}}$ Where: <table border="1" data-bbox="919 435 1373 737"> <tr> <td><math>N_{\text{project}}</math></td> <td>Number of households use water purifier in project scenario</td> </tr> <tr> <td><math>N_{\text{baseline}}</math></td> <td>Number of households use water purifier in baseline scenario (the applied value is 0)</td> </tr> </table>	$N_{\text{project}}$	Number of households use water purifier in project scenario	$N_{\text{baseline}}$	Number of households use water purifier in baseline scenario (the applied value is 0)	100% data	At the time of each verification		
$N_{\text{project}}$	Number of households use water purifier in project scenario										
$N_{\text{baseline}}$	Number of households use water purifier in baseline scenario (the applied value is 0)										
End User	3.9.1	Reduction HAP	Net Benefit SDG 3 = $HARR_y = ((P_{b,y} - P_{p,y})/P_{b,y}) * U_{p,y}$ Where: <table border="1" data-bbox="919 906 1373 1252"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><math>HARR_y</math></td> <td>Total reduction in Household Air Pollution for project activity in year y (%)</td> </tr> <tr> <td><math>P_{b,y}</math></td> <td>Quantity of fuel that is consumed in the</td> </tr> </tbody> </table>	Parameter	Description	$HARR_y$	Total reduction in Household Air Pollution for project activity in year y (%)	$P_{b,y}$	Quantity of fuel that is consumed in the	Stratified Random sampling with 95 per cent confidence interval and a 10 per cent margin of error achieved for the operational water purifier as per AMS-III.AV methodology <sup>7</sup>	At the time of each verification
Parameter	Description										
$HARR_y$	Total reduction in Household Air Pollution for project activity in year y (%)										
$P_{b,y}$	Quantity of fuel that is consumed in the										

<sup>7</sup> Available from corresponding VCS Monitoring Report for the given monitoring period

				baseline scenario during year y		
			$P_{p,y}$	Quantity of fuel that is consumed in the project scenario during year y (=0)		
			$U_{p,y}$	Usage rate in project scenario during year y		
End-users	4.3	Number of people receiving formal and/or non-formal education and training	Net benefit SDG 4 = Number of individual who received any informal and/or formal education to enable their employment in project activity		Education and Training Records	At the time of each verification
Women and Children	5.4	Number of end users reporting reduction in their time spent on unpaid domestic and care work, by sex, age and location.	Net benefit SDG 5 = Number of end users reporting reduction in their time spent on unpaid domestic and care work, by sex, age and location		Stratified Random sampling with 95 per cent confidence interval and a 10 per cent margin of error achieved for monitored parameter	At the time of each verification
End-user	6.1	Increase of population who are used safely	Net benefit SDG 6 = $HH_{project} - HH_{baseline}$ Where:		100% of data	At the time of each verification

		managed drinking water service	<table border="1"> <tr> <td>HH<sub>project</sub></td> <td>Number of households with access to project water purifier in the project scenario</td> </tr> <tr> <td>HH<sub>baseline</sub></td> <td>Number of households have not access to safe drinking water in the baseline scenario</td> </tr> </table>	HH <sub>project</sub>	Number of households with access to project water purifier in the project scenario	HH <sub>baseline</sub>	Number of households have not access to safe drinking water in the baseline scenario				
HH <sub>project</sub>	Number of households with access to project water purifier in the project scenario										
HH <sub>baseline</sub>	Number of households have not access to safe drinking water in the baseline scenario										
Implementation on partners	8.3 (Project specific indicator)	Number of informal employment in total employment, by sector and sex	<table border="1"> <tr> <td colspan="2">Net benefit 8 = <math>ES_{project} - ES_{baseline}</math></td> </tr> <tr> <td>ES<sub>project</sub></td> <td>Employment created for implementation, operation and maintenance at the project</td> </tr> <tr> <td>ES<sub>baseline</sub></td> <td>Employment created at the baseline</td> </tr> </table>	Net benefit 8 = $ES_{project} - ES_{baseline}$		ES <sub>project</sub>	Employment created for implementation, operation and maintenance at the project	ES <sub>baseline</sub>	Employment created at the baseline	Stratified Random sampling with 95 per cent confidence interval and a 10 per cent margin of error achieved for the monitored parameter	At the time of each verification
Net benefit 8 = $ES_{project} - ES_{baseline}$											
ES <sub>project</sub>	Employment created for implementation, operation and maintenance at the project										
ES <sub>baseline</sub>	Employment created at the baseline										

## Sampling Plan

### a. Objectives and reliability requirements

As a rule, the most appropriate confidence/precision levels required by the methodology AMS-III.AV (version 08.0) and the Sampling Standard will be applied whenever sampling is undertaken. According to the Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of instances, which will typically be the case for this grouped project. In the case of conducting instance-specific sampling, the methodology AMS-III.AV (version 08.0) requires 90/10 confidence/precision if annual sampling is applied, or 95/10 confidence/precision if biennial (every two years) sampling is applied.

The objective of the sampling effort will be to meet the monitoring requirements set forth in the methodologies AMS-III.AV (Version 08.0). Monitoring will be carried out on an annual basis (or biennial for specific parameters when allowed by the methodology. As the grouped project progresses and the number of instance increases, the sampling plan can apply to a group of instances. This will be applicable to instance types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the CME may monitor instances individually. All monitoring shall be coordinated by the CME.

Parameter	Description of parameter	Monitoring frequency
Py	Population who consumes the purified water serviced by the project activity in year y	At least annually
Check for SDW public distribution network	Annual check if there is a public distribution network supplying SDW is installed	At least annually
m	Fraction of functional appliances that are meeting the SDWP Standard	At least annually
Quality of safe drinking water	The quality of the safe drinking water	At least every two years

### b. Target population

The target population (Users – including households) will be the total population served under the specific instance project activity or group of instances.

### c. Sampling method

Sampling will be conducted using stratified random sampling techniques, and detailed calculations are provided within the monitoring plan as per CDM guidelines “Sampling and surveys for CDM project activities and programmes of activities”. Optionally, other sampling approaches may be used in accordance with “Sampling and surveys for CDM project activities and programmes of activities” and Guideline for Sampling and Surveys for CDM Project.



#### d. Sample size

The sample size will be calculated using the EB 86, “Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities”, version 04.0.

According to the “Standard for sampling and surveys for CDM project activities and programme of activities”, if there is more than one parameter to be estimated, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen as sampling effort with one common survey, or separate sampling efforts and surveys are undertaken for each parameter.

Thus, there are different equations to calculate a required sample size for different situations. Different equation that will be used, depends on the type of parameter of interest, that is either:

For all of the parameters a 90% confidence is required where the margin of error in the estimate is not more than 10% and assuming annual sampling for a single instance. If sampling is done across a group of instance or biennially, parameters shall have a 95% confidence level.

Below formulae assume sampling to be done across a group of instances and hence calculations are demonstrated with a 95% confidence level.

#### 1. Parameter $P_y$

For population who consumes the purified water serviced by the project activity in year y ( $P_y$ ), the equation that will be used is:

$$n \geq \frac{1.96^2 N \times p (1-p)}{(N -1) \times 0.1^2 \times p^2 + 1.96^2 \times p (1- p)}$$

Where:

- n : Sample size
- $N=N_y$  : Population who consumes the purified water serviced by the project activity in year y
- p : Our expected proportion of the installed water purification systems will be in use and operating at the specified efficiency)
- 1.96 : Represents the 95 % confidence required
- 0.1 : Represents the 10 % relative precision

Substituting the values in above equation gives the value of n = [Number of users to be sampled] (rounded up).

The following assumptions are made to exemplify the sample size calculation for parameters:  $P_y$

For project instance 1, the implementer will distribute 26,000 SDWPs and will provide clean drinking water to 26,000 households in Takeo province. Based on the baseline survey that

showed a household size of 4.6 persons per household, the population size, N is taken as 119,600 persons.

It is expected at least 90% of households will be use drinking water from SDWPs, hence the expected proportion p for  $N_{y,ij}$  is taken as 0.9.

Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 119,600 \times 0.9 (1-0.9)}{(119,600 - 1) \times 0.1^2 \times 0.9^2 + 1.96^2 \times 0.9 (1- 0.9)}$$

Which comes out to be  $n \geq 42.68$

$$n = 43$$

Therefore, in this case a sample size of 43 is to be sampled from each primary sampling unit.

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. The sample size is 43.

## 2. Parameter m

$$n \geq \frac{1.96^2 N \times p (1-p)}{(N - 1) \times 0.1^2 \times p^2 + 1.96^2 \times p (1- p)}$$

Where:

- n : Sample size
- N=N<sub>y</sub> : Number of SDWPs in the target population
- p : Our expected proportion of the installed water purification systems will be in use and operating at the specified efficiency)
- 1.96 : Represents the 95 % confidence required
- 0.1 : Represents the 10 % relative precision

Substituting the values in above equation gives the value of n = [Number of users to be sampled] (rounded up).

The following assumptions are made to exemplify the sample size calculation for parameters m  
 For project instance 1, the implementer will distribute 26,000 SDWPs and will provide clean drinking water to 26,000 households in Takeo province.

It is expected at least 90% of households will be use drinking water from SDWPs, hence the expected proportion p for  $N_{y,ij}$  is taken as 0.9.

Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 26,000 \times 0.9 (1 - 0.9)}{(26,000 - 1) \times 0.1^2 \times 0.9^2 + 1.96^2 \times 0.9 (1 - 0.9)}$$

Which comes out to be  $n \geq 42.68$

$n = 43$

Therefore, in this case a sample size of 43 is to be sampled from each primary sampling unit.

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. The sample size is 43.

### 3. Check for SDW public distribution network

$$n \geq \frac{1.96^2 N \times p (1-p)}{(N - 1) \times 0.1^2 \times p^2 + 1.96^2 \times p (1- p)}$$

Where:

- $n$  : Sample size
- $N=N_y$  : Number of SDWPs in the target population
- $p$  : Our expected proportion of the installed water purification systems will be in use and operating at the specified efficiency)
- 1.96 : Represents the 95 % confidence required
- 0.1 : Represents the 10 % relative precision

Substituting the values in above equation gives the value of  $n =$  [Number of users to be sampled] (rounded up).

The following assumptions are made to exemplify the sample size calculation for parameters: Check for SDW public distribution network

For project instance 1, the implementer will distribute 26,000 SDWPs and will provide clean drinking water to 26,000 households in Takeo province.

It is expected at least 90% of households will be use drinking water from SDWPs, hence the expected proportion  $p$  for  $N_{y,i,j}$  is taken as 0.9.

Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated as:

$$n \geq \frac{1.96^2 \times 26,000 \times 0.9 (1 - 0.9)}{(26,000 - 1) \times 0.1^2 \times 0.9^2 + 1.96^2 \times 0.9 (1 - 0.9)}$$

Which comes out to be  $n \geq 42.68$

$n = 43$

Therefore, in this case a sample size of 43 is to be sampled from each primary sampling unit.

In case the resulting sample size to achieve the desired confidence/precision levels is smaller than 30, a minimum sample size of 30 shall be chosen when the parameter of interest is a proportion. The sample size is 43

#### 4. Quality of safe drinking water:

$$n \geq \frac{1.96^2 NV}{(N - 1) \times 0.1^2 + 1.96^2 \times V}$$

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

Where:

$n$  : Sample size

$N = N_y$  : Number of SDWPs in the target population.

1.96 : Represents the 95% confidence required

0.1 : Represents the 10% relative precision

Mean : Our expected mean

SD : Our expected standard deviation

Substituting the values in above equation gives the value of  $n =$  [Number of user to be samle] (round up).

The following assumptions are made to exemplify the sample size calculation for parameter: Quality of safe drinking water.

The project proponent will distribute 26,000 SDWPs under proposed instance. Hence, population size,  $N$  is taken as 26,000 SDWPS.

The expected mean of functional appliances that are meeting the SDWP Standard is 0.9 and its standard deviation is 0.09 for  $m$ .

Based on the above assumptions, the sample size calculation for a 95/10 confidence/precision would be

$$n \geq \frac{1.96^2 \times 26,000 \times (0.09/0.9)^2}{(26,000 - 1) \times 0.1^2 + 1.96^2 \times (0.09/0.9)}$$

Using above values, the sample size comes out to be 3.84 or 4

As the calculated sample size (for parameter of interest is a numeric mean value) is less than 30 samples, the Student's t-distribution will be used to calculate the sample size (in accordance with paragraph 13 of standard: sampling and survey for CDM project activities and programmes of activities (version 09.0))

As the sample size calculated above is less than 30, the Student's t-distribution has been used to calculate the sample size (in accordance with paragraph 13 of standard: sampling and survey for CDM project activities and programmes of activities (version 09.0):

Monitoring Parameter	Fraction of functional appliances				
<b>Sampling approach</b>	Stratified random sampling based on water purifier year of distribution				
Stratum Number	Year of Distribution	Population Size	Expected Mean	Expected Standard Deviation	Calculated Sample Size
Year 2022	2022	26,000	0.9000	0.090	7
Sample size determination					
<b>Mean</b>					0.9000
<b>Standard Deviation (SD)</b>					0.0900
$V_{\text{mean}} = (\text{SD}/\text{mean})^2$					0.01000
<b>Minimum Sample Size required</b>					4
<b>tDistribution sample size adjustment</b>				<b>Iteration 1</b>	11
				<b>Iteration 2</b>	5
				<b>Iteration 3</b>	8
				<b>Iteration 4</b>	6
				<b>Iteration 5</b>	7
				<b>Iteration 6</b>	6

The adjusted sample size obtained after applying Student's t-distribution is 7. Therefore, in this case a sample size of 7 is to be sampled from each primary sampling unit.

For each of the parameter, sample sizes will be sufficient to ensure that the precision of the sample means/proportion are in accordance to the Sampling Frame established for the instance with in the grouped project to estimate emissions reductions. In cases where survey results indicate that desired precision is not achieved, the low bound of corresponding confidence interval of the parameter value may be used as an alternative to repeating the survey. Alternatively, the survey may be expanded to reach the required confidence/precision. The sampling methodology will be accordance with the representative sampling methods

provided by the methodology AMS-III.AV (version 08.0) and other CDM sampling standard and guidelines as indicated along this section. There may be non-response from the target population. Thus, over sampling by 10% may be used to avoid non response; however, sampling may be ceased once required confidence/precision is met.

e. Sample Frame

The sampling frame refers to all the SDWPs in the database.

Implementers and different models of SDWP. As explained below, to take the different characteristics of different project proponent and SDWP models and other factors that may affect estimates into consideration, this project shall be either sampled separately and independently, or grouped together under a single sampling plan across instance, in each case using strata that have unique combinations of these factors.

The total number of appliances installed under the grouped project and operated per type of technology in that monitoring period will be the total sampling frame per distributed technology. Out of these appliances, samples will be selected for the respective appliance type. Random numbers will be generated and saved in a computer file and these will then be used to select the samples from the project database.

### 3.4 Net Positive Stakeholder Well-being Impacts

According to the sections 2.1.1 and 3.2 of the SD VISta report, each and every one of the effects that have been found results in a positive impact. The execution of the grouped projects will not have any significant negative effects on the biological system of the places that are immediately next to them. Since this project activity will aid in lowering the use of fuel wood by efficiently burning fuel, it will also help reduce the amount of deforestation that occurs and the amount of pollution that occurs within households. The deployment of technology that ensures clean drinking water will lessen the negative environmental and social repercussions that are linked with the usage of biomass that is not renewable.

## 4 BENEFITS FOR THE PLANET

### 4.1 Condition of Natural Capital and Ecosystem Services at Project Start

In the face of the ongoing expansion of development and infrastructure projects, facilitated by capital inflows and investments, the environmental preservation and effective management of natural resources is of vital importance for the well-being of millions of Cambodians.

Cambodia’s natural ecosystem is highly rich and varied, including many different types of forest and flora, minerals, coral reefs and a wide number of wildlife species. Despite nearly 40% of Cambodia’s land being protected under law, worsening environmental degradation is causing irreversible damage to the ecosystem, threatening biodiversity, wildlife and natural resources. Forest land conversion for agricultural purposes, mining and extractive activities are accelerating rates of land degradation and deforestation. Together with illegal timber harvesting, wildlife poaching and over-fishing, these activities are generating serious risks for soil fertility, carbon sequestration and watershed stability. Deforestation further exacerbates Cambodia’s high vulnerability to the impacts of climate change, intensifying floods and droughts. As wet seasons change and become less predictable, livelihoods from rice cultivation, fishing and agriculture are endangered<sup>8</sup>.

Cambodia lost nearly 2.2 million hectares<sup>9</sup> of tree cover between 2001 and 2018, and the annual rate of loss increased by almost 300 percent during the same period. Data from Global Forest Watch’s Dashboards shows that, since 2001, Cambodia has lost about 24 percent of its tree cover. From 2001 to 2022, Cambodia lost 1.40 Mha of tree cover, equivalent to a 33% decrease in tree cover since 2000, and 888 Mt of CO<sub>2</sub>e emissions<sup>10</sup>.



Figure 1: Tree Cover Lost in Cambodia from 2001 to 2022

<sup>8</sup> USAID, 2019. “[Environment and Resilience](#)”. Accessed 22 Sep 2020.

<sup>9</sup> <https://thediplomat.com/2021/11/will-cambodia-commit-to-protecting-its-forests/>

<sup>10</sup> <https://www.globalforestwatch.org/blog/data-and-research/whats-happening-in-cambodias-forests/>

In Cambodia, 27.76% the population using at least basic drinking water by 2020<sup>11</sup>. Surface water in Cambodia is often plentiful but generally of poor quality, due in part to inadequate or non-existent sanitation in rural areas<sup>12</sup>. This leads to diarrhea and other water-borne diseases. And the most common way of treating drinking water for safer use is boiling. Based on a document of World Bank, over 90 percent of energy used for cooking comes from wood, contributing to increased deforestation<sup>13</sup>. The use of wood for burning directly leads to increase greenhouse gas emissions. Furthermore, it can affect to user's health.

The most common way to treat drinking water for safer use is boiling. This directly increases greenhouse gas emissions, while using firewood to boil water also contributes to deforestation and threatens biodiversity. There are also cases of not boiling, or only occasionally boiling, contracting water-borne diseases.

## 4.2 Expected Impacts on Natural Capital and Ecosystem Services

<b>Impact #1</b>	Reduced demand for non-renewable woody biomass for boiling water purpose
<b>Type of Impact</b>	Positive, predicted, indirect
<b>Affected Natural Capital and/or Ecosystem Service(s)</b>	Biodiversity and Species Richness, Soil and Water Conservation
<b>Resulting Change in Condition</b>	By slowing the consumption of wood fuel for boiling water purposes, households require less non-renewable woody biomass. The resulting drop in demand slows deforestation, thus increasing the renewable energy share in the total final energy consumption of the project area.

<sup>11</sup> <https://data.worldbank.org/indicator/SH.H2O.SMDW.ZS?locations=LA-KH>

<sup>12</sup> <https://documents1.worldbank.org/curated/en/211941468216599631/pdf/410240KH0ceramic0filters01PUBLIC1.pdf>

<sup>13</sup> <https://documents1.worldbank.org/curated/en/570931468036882999/pdf/696390ESWOP1010ECHNOL0GIESOCambodia.pdf>



<b>Impact #2</b>	Tonnes of greenhouse gas emission avoided or removed
<b>Type of Impact</b>	Positive, predicted, indirect
<b>Affected Natural Capital and/or Ecosystem Service(s)</b>	Planet
<b>Resulting Change in Condition</b>	Reduction of emission reduction as estimated in VCS PD.

### 4.3 Natural Capital and Ecosystem Services Monitoring Plan

The project proponent will monitor the following to evaluate the net ecological of the grouped project

**Prior the installation:** Determine the quantity of woody biomass that was converted into fuel wood in order to fulfil the requirements for the required amount of thermal energy in order to bring water to a boil using firewood.

It will be SIPCO's responsibility to gather survey data, and it will be the Program Development team's responsibility to review the data, finish any essential computations, and present their findings.

Natural capital impacted	SDG Indicator	Monitoring parameter	Monitoring Approach	Sampling	Monitoring Frequency
Atmosphere	13.0	Reduce GHG emission	$BE_y = QPW_y \times m \times X_{boil} \times SEC \times \sum_i (BL_{fuel,i} \times f_i \times EF_{projected\ fossilfuel,i} \times 10^{-9})$ Monitoring report for the corresponding SD Vista period of VCS PD 3599	This parameter will be monitored under VCS program for the said project with only the results obtained during corresponding SD VISTA MP being considered in estimations. No separate sampling or monitoring will be undertaken under SD VISTA program.	At every verification circle
Forest Ecosystem	15.2 (Project specific indicator)	Fuelwood save by project water purifier	$B_{y,saving} = B_{y,project} - B_{y,baseline}$ The project activity avoids boiling drinking water, So $B_{y,project} = 0$	This parameter will be monitored though the amount of firewood needed to boil water using the baseline stove during the first verification and monitoring the project device used at the verification.	At every verification circle

#### 4.4 Net Positive Natural Capital and Ecosystem Services Impacts

The anticipated net impact of the project activity is positive of natural capital and ecosystem services, since the urgent action is taken to combat climate change by avoiding using traditional cookstove to boil water with safe drinking water technology, the project reduces energy demand in the form of non-biomass wood fuel use, thus generating net GHG emission. The first activity instance generates an estimated 43,129 tCO<sub>2</sub>e GHG emission reductions over a year. The crediting period is expected to be 10 years. And it estimated reduction of ~ 1,09 tons of woody biomass/household/year<sup>14</sup>. The following table summarize the net positive natural impact by the project.

	Target beneficiary	SDG	Parameter	Impact
Environmental well-being	Natural Capital	13	Amount of CO <sub>2</sub> e emissions avoided or sequestered per year	Positive
	Natural Capital	15.2	Total non-renewable wood fuel saved after preventing to boil drinking water.	Positive

<sup>14</sup> This is an estimated number during the baseline survey process. This parameter will be calculated in the monitoring phase

# APPENDIX 1: CAUSAL CHAIN

