



GROUPED PROJECTS FOR WATER PURIFIERS FOR CLIMATE AND COMMUNITY ACTION

Document Prepared by:

Sustainability Investment Promotion and Development

Joint Stock Company

(SIPCO)

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The intention of the grouped project activity (“hereafter “proposed project activity”) involves the installation of low greenhouse gas emitting safe drinking water purifier (SDWP) to provide clean drinking water to the households (hereafter “users”) of Vietnam. For this reason, this proposed project activity aims at reducing the woodfuel consumption of traditional stove users by distributing water purifiers to households.

The grouped project activity reduces the use and demand non-renewable biomass that would have been used to boil water as a means to purify water 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 rural communities with no previous water purifiers access. The geographical boundary is in Viet Nam. Water purifiers are distributed free of cost to users. 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 in three stone open fires to meet the boiling water demand.

The water purifiers (model Ecozen -25) covered under the project has been manufactured by Viet Charcoal Production Company Limited. The equipment lifetime is 10 years. The carbon credits shall be claimed only till the end of the operational life of the project devices.

Currently, there are 30 project instances under the grouped project¹. The first water purifier was distributed on 01 November 2021. The first monitoring period is from 01 November 2021 to 30 November 2022. The second monitoring period is from 01 December 2022 to 30 June 2023. The third monitoring period is from 01 July 2023 to 31 December 2023. The fourth monitoring period is from 01 January 2024 to 30 June 2024. The fifth monitoring period is from 01 July 2024 to 31 December 2024. Till the end of 5th monitoring period, a total of 364,000 water purifiers was reported installed under the project. During last monitoring survey, we identified 1 water purifier of WP-008-13271 which was not operated. So we revised the database with details of 363,999 WPs. Please note that the operational rate during last monitoring period for age = 2 is 0.9804. But we could not identify the non-operational except the WP-008-13271. Therefore, during the calculation of still operation, we include the non-operational rate of last monitoring for

¹ The detail of the 30 project instances is mentioned in the section 3.1

conservative. Therefore, total of operated water purifiers in fifth monitoring period is 363,999 WPs. Detail below:

Table 1: Distribution schedule

Month of installation	Number of distributed Water Purifiers	Number of operated water purifiers in this MP
11/2021	100	100
04/2022	2,150	2,150
05/2022	7,750	7,750
06/2022	10,314	10,314
07/2022	19,913	19,913
08/2022	19,667	19,667
09/2022	40,084	40,083
10/2022	88,520	88,520
11/2022	93,591	93,591
12/2022	81,911	81,911
Total	364,000	363,999

The total GHG emission reductions generated in the fifth monitoring period from 01 July 2024 to 31 December 2024 is 266,631 tCO₂e GHG emission reductions.

1.2 Audit History

Audit Type	Period	Program	Validation/verification body name	Number of years
Validation	20 January 2022 (The date of registration)	VCS	Carbon Check (India) Private Ltd	
Verification	01 November 2021 – 30 November 2022	VCS	Carbon Check (India) Private Ltd	1.08

Verification	01 December 2022 – 30 June 2023	VCS	EPIC Sustainability Services Pvt. Ltd	0.58
Verification	01 July 2023 – 31 December 2023	VCS	Ecolance Pvt. Ltd.	0.5
Verification	01 January 2024 – 30 June 2024	VCS	Ecolance Pvt. Ltd.	0.5
Verification	01 July 2024 – 31 December 2024	VCS	Ecolance Pvt. Ltd.	0.5

1.3 Sectoral Scope and Project Type

Sectoral scope ²	03 – Energy Demand
Project activity type	Type III – Other projects activities not included in Type I or Type II that result in GHG emission reductions not exceeding 60,000 tCO ₂ e per year in any year of the crediting period”.

1.4 Project Proponent

Organization name	Sustainability Investment Promotion and Development Joint Stock Company. (SIPCO)
Contact person	Mr. Hoang Anh Dung
Title	Chairman
Address	5th Floor, Sunrise Building, No.25B3, 57 Lang Ha Street, Ba Dinh District, Hanoi, Viet Nam
Telephone	+84 243 519 0955
Email	dung.hoang@carbonvietnam.com

1.5 Other Entities Involved in the Project

The project activity is invested by SIPCO only, no other entities involved in the project so this section is not applicable.

² Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

1.6 Project Start Date

Project start date	01-November-2021
Justification	The project start date of a non-AFOLU project is the date on which the project began generating GHG emission reductions or removals. The project start date is 01 November 2021 which is the distribution date of the first water purifier.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☒ Ten years, fixed ☐ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
Start and end date of first or fixed crediting period	01 November 2021 to 31 October 2031

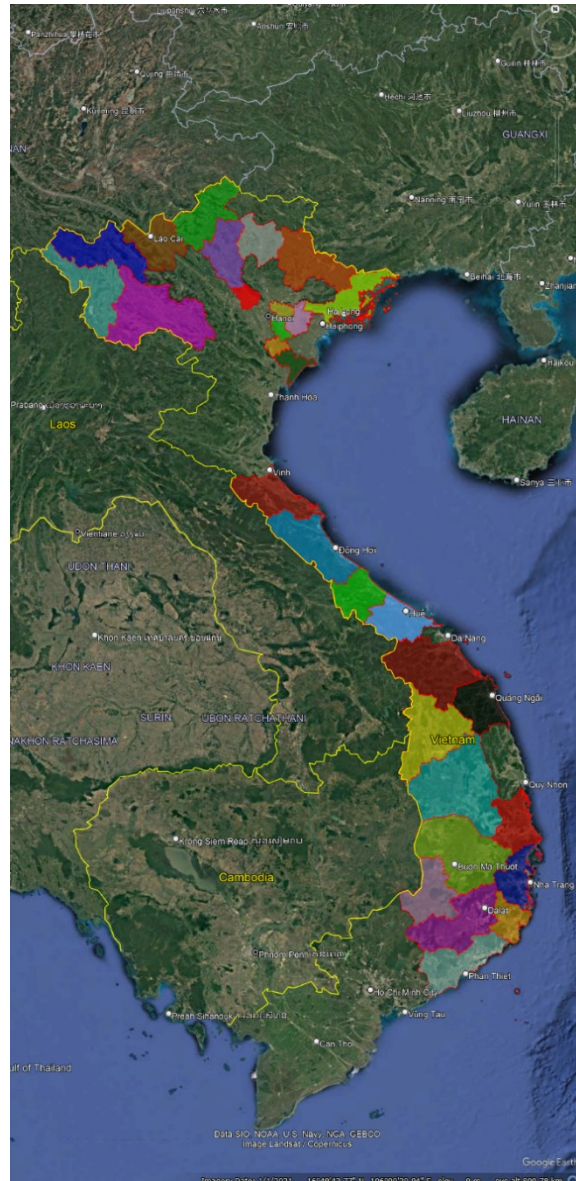
1.8 Project Location

The grouped project will be hosted by Viet Nam. The grouped project covers the 30 provinces of Tuyen Quang, Nam Dinh, Lai Chau, Dien Bien, Lao Cai, Son La, Quang Ninh, Bac Ninh, Ha Nam, Vinh Phuc, Quang Binh, Phu Yen, Dak Lak, Kon Tum, Lam Dong, Ha Tinh, Quang Tri, Gia Lai, Lang Son, Ha Giang, Hai Duong, Hung Yen, Thua Thien Hue, Quang Nam, Quang Ngai, Binh Thuan, Khanh Hoa, Ninh Thuan, Dak Nong and Bac Kan in Viet Nam bounded between.

Latitudes: 14.315425 N

Longitudes: 108.339537 E

The details of coordinates are being submitted separately as KML file.



Map 1: Map of grouped project

Detail geographic information of the project activity instance is below:

Project activity Instance	Province	Coordinate
PA 1	Tuyen Quang	22.1727° N, 105.3131° E https://www.google.com/maps/place/Tuy%C3%AAn+Quang.+Vi%E1%BB%87t+Nam/@22.0969536,104.9422137,10z/data=!3m1!4b1!4m6!3m5!1s0x3134adfba5491ee1:0x7f5401719284787f!8m2!3d22.1726708!4d105.3131185!16zL20vMDdjZHMx?hl=vi-VN

PA 2	Nam Dinh	20.2792° N, 106.2051° E https://www.google.com/maps/place/Nam+%C4%90%E1%BB%8Bnh,+Vi%E1%BB%87t+Nam/@19.7105244,107.5739664,8z/data=!4m6!3m5!1s0x31360c2151521bdf:0xc8eba2bffe25df62!8m2!3d20.2791804!4d106.2051484!16zL20vMDdtMWRq?hl=vi-VN
PA 3	Lai Chau	22.3687° N, 103.3119° E https://www.google.com/maps/place/Lai+Ch%C3%A2u,+Vi%E1%BB%87t+Nam/@22.2482639,102.8718826,10z/data=!3m1!4b1!4m6!3m5!1s0x312d322c39d1b451:0xe229916091483c2e!8m2!3d22.3686613!4d103.3119085!16zL20vMDJ3aDis?hl=vi-VN
PA 4	Dien Bien	21.8042° N, 103.1077° E https://www.google.com/maps/place/%C4%90i%E1%BB%87n+Bi%C3%AAn,+Vi%E1%BB%87t+Nam/@21.7191452,102.3094314,9z/data=!3m1!4b1!4m6!3m5!1s0x312d1f0ee0d1fbf3:0x48718c8562df0ef4!8m2!3d21.8042309!4d103.1076525!16zL20vMDJnajiJr?hl=vi-VN
PA 5	Lao Cai	22.3381° N, 104.1487° E https://www.google.com/maps/place/L%C3%A0o+Cai,+Vi%E1%BB%87t+Nam/@21.2083468,103.1400565,7z/data=!4m6!3m5!1s0x36cd3b8cbf4c0e07:0x21a2b6b9fb469068!8m2!3d22.3380865!4d104.1487055!16zL20vMDIOczE3?hl=vi-VN
PA 6	Son La	21.1022° N, 103.7289° E https://www.google.com/maps/place/S%C6%A1n+L%C3%A0,+Vi%E1%BB%87t+Nam/@21.3009206,103.5568492,9z/data=!3m1!4b1!4m6!3m5!1s0x31325990dc3d1dd5:0x582d645a6a0f387b!8m2!3d21.1022284!4d103.7289167!16zL20vMDdtMWpj?hl=vi-VN
PA 7	Quang Ninh	21.0064° N, 107.2925° E https://www.google.com/maps/place/Qu%E1%BA%A3ng+Ninh,+Vi%E1%BB%87t+Nam/@21.1506388,106.992521,10z/data=!3m1!4b1!4m6!3m5!1s0x314b01d79a78852f:0xed0779f4f0a5866a!8m2!3d21.006382!4d107.2925144!16zL20vMDZnX3M5?hl=vi-VN

PA 8	Bac Ninh	21.1214° N, 106.1111° E https://www.google.com/maps/place/B%E1%BA%AFc+Ninh,+Vi%E1%BB%87t+Nam/@21.3386452,105.8196901,10z/data=!4m6!3m5!1s0x31350a5d26af7a51:0xe55920c0c6558f70!8m2!3d21.121444!4d106.1110501!16zL20vMDNxNmZ3?hl=vi-VN
PA 9	Ha Nam	20.5835° N, 105.9230° E https://www.google.com/maps/place/H%C3%A0+Nam,+Vi%E1%BB%87t+Nam/@20.533743,105.8357658,11z/data=!3m1!4b1!4m6!3m5!1s0x3135c511181964e1:0x74a9b90d3b326852!8m2!3d20.5835196!4d105.92299!16zL20vMDdtMTI?hl=vi-VN
PA 10	Vinh Phuc	21.3609° N, 105.5474° E https://www.google.com/maps/place/V%C4%A9nh+Ph%C3%BAC,+Vi%E1%BB%87t+Nam/@21.3629465,105.4178304,11z/data=!3m1!4b1!4m6!3m5!1s0x3134e54d82ea2dbb:0xc0d08e3fe11b105f!8m2!3d21.3608805!4d105.5474373!16zL20vMDdtMWtk?hl=vi-VN
PA 11	Quang Binh	17.6103° N, 106.3487° E https://www.google.com/maps/place/Qu%E1%BA%A3ng+B%C3%ACnh,+Vi%E1%BB%87t+Nam/@17.5049575,106.0197994,10z/data=!3m1!4b1!4m6!3m5!1s0x3138b0f638296f2d:0x901f872e6223598f!8m2!3d17.6102715!4d106.3487474!16zL20vMDdsX3h2?hl=vi-VN
PA 12	Phu Yen	13.0882° N, 109.0929° E https://www.google.com/maps/place/Ph%C3%BA+Y%C3%AAn,+Vi%E1%BB%87t+Nam/@13.2011058,108.7842812,10z/data=!3m1!4b1!4m6!3m5!1s0x316f70bf634caeff:0xfe6e1c1c171a80!8m2!3d13.0881861!4d109.0928764!16zL20vMDdtMWWhu?hl=vi-VN
PA 13	Dak Lak	12.7100° N, 108.2378° E https://www.google.com/maps/place/%C4%90%E1%BA%AFk+L%E1%BA%AFk,+Vi%E1%BB%87t+Nam/@12.7877909,107.9590977,10z/data=!3m1!4b1!4m6!3m5!1s0x3171f7daf7307157:0x8ef97694d9883315!8m2!3d12.7100116!4d108.2377519!16zL20vMDUzZDU3?hl=vi-VN

PA 14	Kon Tum	14.6612° N, 107.8389° E https://www.google.com/maps/place/Kon+Tum,+Vi%E1%BB%87t+Nam/@14.6686635,107.3793971,9z/data=!3m1!4b1!4m6!3m5!1s0x316be72358aad1d1f:0x619b11aacc88a54!8m2!3d14.661167!4d107.83885!16zL20vMDU3cTAz?hl=vi-VN
PA 15	Lam Dong	11.5753° N, 108.1429° E https://www.google.com/maps/place/L%C3%A2m+%C4%90%E1%BB%93ng,+Vi%E1%BB%87t+Nam/@11.7651411,107.7169621,10z/data=!3m1!4b1!4m6!3m5!1s0x3171132659f3db7d:0xbb5ad2df5f54f56c!8m2!3d11.5752791!4d108.1428669!16zL20vMDdi-anox?hl=vi-VN
PA 16	Ha Tinh	18.2944° N, 105.6745° E https://www.google.com/maps/place/H%C3%A0+T%C4%A9nh,+Vi%E1%BB%87t+Nam/@18.3600801,105.5234041,10z/data=!3m1!4b1!4m6!3m5!1s0x313828a1eee9c3c7:0x1ac77b26b87d106b!8m2!3d18.2943776!4d105.6745247!16zL20vMDdmc3N5?hl=vi-VN
PA 17	Quang Tri	16.7943° N, 106.9634° E https://www.google.com/maps/place/Qu%E1%BA%A3ng+Tr%E1%BB%8B,+Vi%E1%BB%87t+Nam/@16.7345587,106.6717562,10z/data=!3m1!4b1!4m6!3m5!1s0x3140e4abaa1df129:0xe471fae020d54d28!8m2!3d16.7943472!4d106.963409!16zL20vMDVyd3Jq?hl=vi-VN
PA 18	Gia Lai	13.8079° N, 108.1094° E https://www.google.com/maps/place/Gia+Lai,+Vi%E1%BB%87t+Nam/@13.7989509,107.6002884,9z/data=!3m1!4b1!4m6!3m5!1s0x316c1f82022f81a3:0x8c52b5f68143b50d!8m2!3d13.8078943!4d108.109375!16zL20vMDdtMTFs?hl=vi-VN
PA 19	Lang Son	21.8564° N, 106.6291° E https://www.google.com/maps/place/L%E1%BA%A1ng+S%C6%A1n,+Vi%E1%BB%87t+Nam/@21.8928274,106.4485828,10z/data=!3m1!4b1!4m6!3m5!1s0x36b5543eb745256f:0xfa3d34da85826e5a!8m2!3d21.8563705!4d106.6291304!16zL20vMDZuMnhx?hl=vi-VN

PA 20	Ha Giang	22.7662° N, 104.9389° E https://www.google.com/maps/place/H%C3%A0+Gi+ang,+Vi%E1%BB%87t+Nam/@22.7788949,104.6736905,10z/data=!3m1!4b1!4m6!3m5!1s0x36cc79caead371b1:0x834878b09acb80a8!8m2!3d22.7662056!4d104.9388853!16zL20vMDI0bjdj?hl=vi-VN
PA 21	Hai Duong	20.9386° N, 106.3207° E https://www.google.com/maps/place/H%E1%BA%A3i+D%C6%B0%C6%A1ng,+Vi%E1%BB%87t+Nam/@20.958668,106.2274023,11z/data=!3m1!4b1!4m6!3m5!1s0x314a7af448e05235:0x82e957d1041d9053!8m2!3d20.9385958!4d106.3206861!16zL20vMDdtMTg1?hl=vi-VN
PA 22	Hung Yen	20.8526° N, 106.0170° E https://www.google.com/maps/place/H%C6%B0ng+Y%C3%AAn,+Vi%E1%BB%87t+Nam/@20.8100609,105.9403332,11z/data=!3m1!4b1!4m6!3m5!1s0x3135af35301d265d:0xa7a9ea16cfd6d482!8m2!3d20.8525711!4d106.0169971!16zL20vMDdtMWZ4?hl=vi-VN
PA 23	Thua Thien Hue	16.4674° N, 107.5905° E https://www.google.com/maps/place/Th%E1%BB%A Ba+Thi%C3%AAn+Hu%E1%BA%BF,+Vi%E1%BB%87t+Nam/@16.3686343,107.3230359,10z/data=!3m1!4b1!4m6!3m5!1s0x31419c87726490f7:0xab1c0fc7cb84b5!8m2!3d16.467397!4d107.5905326!16zL20vMDYyNG5j?hl=vi-VN
PA 24	Quang Nam	15.5394° N, 108.0191° E https://www.google.com/maps/place/Qu%E1%BA%A3ng+Nam,+Vi%E1%BB%87t+Nam/@15.5095641,107.3149508,9z/data=!3m1!4b1!4m6!3m5!1s0x31420dd4e1353a7b:0xe49cabb166747679!8m2!3d15.5393538!4d108.019102!16zL20vMDRsZI9n?hl=vi-VN&entry=ttu

PA 25	Quang Ngai	15.0760° N, 108.7126° E https://www.google.com/maps/place/Qu%E1%BA%A3ng+Ng%C3%A3i,+Vi%E1%BB%87t+Nam/@14.9817272,108.4080347,10z/data=!3m1!4b1!4m6!3m5!1s0x31683eeca9160973:0x4da18d6e3239edb1!8m2!3d15.0759838!4d108.7125791!16zL20vMDZmNW1k?hl=vi-VN
PA 26	Binh Thuan	11.0904° N, 108.0721° E https://www.google.com/maps/place/B%C3%ACnh+Thu%E1%BA%ADn,+Vi%E1%BB%87t+Nam/@11.0141029,107.923566,10z/data=!3m1!4b1!4m6!3m5!1s0x3176c3f2d68f59a1:0x2737428edf34c28e!8m2!3d11.0903703!4d108.0720781!16zL20vMDUzY3Bm?hl=vi-VN
PA 27	Khanh Hoa	12.2585° N, 109.0526° E https://www.google.com/maps/place/Kh%C3%A1nh+H%C3%B2a,+Vi%E1%BB%87t+Nam/@12.3185715,108.7883157,10z/data=!3m1!4b1!4m6!3m5!1s0x31701b8ca8dcd395:0x69c20827322308ce!8m2!3d12.2585098!4d109.0526076!16zL20vMDdsX19w?hl=vi-VN
PA 28	Ninh Thuan	11.6739° N, 108.8630° E https://www.google.com/maps/place/Ninh+Thu%E1%BA%ADn,+Vi%E1%BB%87t+Nam/@11.7379248,108.6112455,10z/data=!3m1!4b1!4m6!3m5!1s0x3170956e17fa09af:0xf8f5929e768e9e45!8m2!3d11.6738767!4d108.8629572!16zL20vMDdtMDFm?hl=vi-VN
PA 29	Dak Nong	12.2646° N, 107.6098° E https://www.google.com/maps/place/%C4%90%E1%BA%AFk+N%C3%B4ng,+Vi%E1%BB%87t+Nam/@12.2799563,107.3798706,10z/data=!3m1!4b1!4m6!3m5!1s0x3173b5ece644a927:0x7530e130f4a387ad!8m2!3d12.2646476!4d107.609806!16zL20vMDVoEgti?hl=vi-VN

PA 30	Bac Kan	22.3033° N, 105.8760° E https://www.google.com/maps/place/B%E1%BA%AFc+K%E1%BA%A1n,+Vi%E1%BB%87t+Nam/@22.272135,105.5579457,10z/data=!3m1!4b1!4m6!3m5!1s0x36cae0484a85eb4d:0xbf0390482b496ed0!8m2!3d22.3032923!4d105.876004!16zL20vMDNxZ21n?hl=vi-VN
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1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	AMS III.AV	Low greenhouse gas- emitting safe drinking water production systems	08
Methodology	VMR 0006	Energy efficiency and fuel switch measures in thermal applications	1.2
Methodology	AMS-I.E	Switch from non-renewable biomass for thermal applications by the user	12.0
CDM Sampling Standard	N/A	Sampling and surveys for CDM project activities and programme of activities	09.0
CDM Sampling Guideline	N/A	Sampling and surveys of CDM project activities and programmes of activities	04.0
Tool	01	Tool for the demonstration and assessment of additionality	07.0
Tool	21	Demonstration of additionality of small-scale project activities	13.1
Tool	30	Calculation of the fraction of non-renewable biomass	04.0

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, *“Carbon credits may be issued through the Verified Carbon Standard project ID 2557 for the greenhouse gas emission reductions and removals associated with Ecozen-25 water purifiers, manufactured by Viet Charcoal Production Company Limited in Di Su commune, My Hao District, Hung Yen Province, Vietnam, distributed by Sustainability Investment Promotion and Development Joint Stock Company (SIPCO)”*.

☒ Yes ☐ No

Detail in Appendix 2 in this report.

1.12 Sustainable Development Contributions

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

- **Environmental sustainability**

The project helps significantly reduce greenhouse gas emissions over its lifetime.

The project helps 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 ensure the maintenance of watersheds that regulate water table levels and prevent flash flooding.

- **Social benefits**

Purchasing or collecting firewood or fossil fuels to boil the water constitutes a significant expense for the very poorest households and communities. The project provides free equipment, people can drink water directly without boiling thus saving firewood and boiling water time for families. That time could be spent to increase productivity and income, 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/fossil fuels.

The project alleviates the work burden of women and children as they have to spend less time to collect firewood for boiling water.

- ***Economic benefits***

The project activity helps develop a section of Viet Nam rural economy through the installation and maintenance of SDWPs³, as well as work related to monitoring of the carbon registration activity.

The proposed project delivers a long term, secure and simple contribution to sustainable development in Viet Nam that would not exist without carbon finance.

The project aligns with and contribute to sustainable development objectives outlined in Table 1 below.

³ SIPCO is an entity undertake the maintenance by hiring the manufacturer and the maintenance done for free to households in lifetime of filter core.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
Sequential row number	SDG Target number	Number and text of SDG indicator or, if no official SDG indicator is applicable, user-defined indicator	Indicate the project's contribution to the SDG Indicator (implemented activities to increase or decrease)	Brief description of the quantifiable impact of the project's activities related to the SDG indicator, during the monitoring period.	Brief description of the cumulative quantifiable impact of the project's activities related to the SDG indicator, over the project lifetime.
1)	1.4	Project specific indicator: Number of households with access to basic services	Implemented activities to increase	Provide 350,118 families with greater access to basic services in the form of clean water technology	The project allowed 364,000 households access to clean water technology until end of this monitoring period.
2)	3.9	Project specific indicator: Number of households experiencing health benefits due to reduced exposure to indoor air pollution	Implemented activities to decrease	100% of households interviewed answered that they drink water directly from project water purifiers without boiling water. Therefore, the project activity helps reduce Household Air Pollution (HAP) by 100% due to boil water by using 350,118 water purifiers in these households in this monitoring period	The project reduced 100% of HAP due to boil water for 364,000 households until end of this monitoring period.

3)	5.4	Project specific indicator: Time spent daily on unpaid domestic and care work, by sex, age and location	Implemented decrease	activities to	Under the project scenario, the household drink water directly, without boiling water. Therefore, they would be able to save 1.973 hours/WP daily, equivalent by 100% time for boiling and collecting wood fuel. The women would also have time to engage in other employment opportunities.	The project activity contributed to time savings of 1.973 hours/WP daily for all of 364,000 households until end of this monitoring period.
4)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented increase	activities to	Reduce the total fuelwood usage in the project area to generate approximately 266,631 tCO2e of emission reductions	The project achieved GHG emission reduction of 1,239,431 tCO2 until end of this monitoring period.
5)	6.1	Project specific indicator: Number of household who have easy access to a safe water supply	Implemented increase	activities to	With the distribution of 364,000 Safe Drinking Water Purifiers (SDWPs), the project lower exposure to unsafe water for 350,118 households	The project allowed 364,000 households to gain access to clean water until end of this monitoring period.
6)	8.3	Project specific Indicator: Number of jobs created for unemployment in total employment.	Implemented increase	activities to	The project has generated 10 employments opportunities for repairmen and maintenance of SDWPs in this monitoring period	The project generated total of 40 employment opportunities until end of this monitoring period.

7)	15.1	15.2.1. Progress towards sustainable forest management by increasing above ground biomass in forests.	Implemented increase	activities to	Contribute an estimated reduction in removal of woody biomass to the tune of more than 1.651 tons per SDWP per year. The total biomass savings for this monitoring period is 291,186 tonnes from forests surrounding the communities thereby leading to an increase in above ground biomass in these forests.	By distributing 364,000 safe water purifiers, using drinking water directly instead of boiling water for drinking, the project help reduction of 1,883,381 tonnes woody biomass in demand for firewood until end of this monitoring period.
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1.13 Commercially Sensitive Information

The project activity involves distribution of water purifier to individual household. There is no commercially sensitive information so this section is not applicable.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification

The stakeholders have been identified as individuals or groups that are potentially affected by the project and within each of the following categories: government, international government agencies, non-governmental organizations, religious aid agencies, academic, current, and potential future implementing partners, water purifier manufactures, carbon sector organizations, partner donors, the media, individuals, and their families.

Stakeholders can be defined by three steps approach as following:

Step 1: The first step is to identify the expected and unforeseen consequences of the project's activities. Once the outcomes are determined, the potential stakeholders affected by these impacts are identified.

Step 2: Following the holistic perspective on the overall benefits and co-benefits of the project, stakeholder group identification is carried out as each stage of project implementation. The examination for stakeholder identification per different stages are as follows:

- Project Initiation: stakeholders include self-help groups such as Women Union or Youth Group who can assist the project initiator in understanding the project benefits

	and potential impediments, making ingress within the community. • Project Development: At this step, stakeholders include government representatives, community development organisations, investors, NGOs working in defined groups, etc • Project Implementation: End-users, implementing partners, water purifier manufacturers, training personnel. The PPs has signed contract with Provincial's women Union, this is an agency with all levels from central to local (village, hamlet), they are close the households and can know exactly these households who are using the traditional cookstove for boiling water and they can select the correct beneficiaries. • Project monitoring (validation and verification): surveyors, database developers, end-users involved in project monitoring. Almost of project stakeholders affected by project activity were identified in the step 2 by SIPCO. Step 3: Select representatives from each stakeholder identified in step 2 as the final step of the identification process. The final list of stakeholder includes end users, representative of Women Union, government authorities, local NGOs and business, local vendor, WP manufacturers. The full list of identified stakeholders has been provided to the VVB as a supportive document.
Legal or customary tenure/access rights	The project activity involves distribution of water purifiers (WPs) to households and it is not involving any legal or customary tenure/access rights to territories and resources. So, this section is not applicable.
Stakeholder diversity and changes over time	Each stakeholder is defined as a group composed of individual stakeholders who derive similar income, livelihood, well -being and/or cultural values from the project and whose values are different from those of other groups. There are many stakeholders identified at period of project activity, from starting, development, implementation

	and monitoring. There is insignificant change in stakeholders' diversity and therefore have no real impact on their opinion during the monitoring period. - WP user: there has been an unquantifiable improvement in their health, livelihood, wellbeing, and income as per exchange during onsite survey. - Women Union: No change in structure & functionality or any organization values. - Local vender: Various local businesses supply wood in the project area. Project activity helps save wood in boiling water so influence consumption of these products and could thus negatively affect vendor livelihoods. - Manufacturer: More jobs for their employees in manufacturing, transportation and maintenance WPs. - Other governmental authority and NGOs: No change was observed in structure & functionality.
Expected changes in well-being	- The project activity is contributing to the reduction in GHG emission due to reduction in use of non-renewable biomass and it can ensure natural recovery of forests. - Community health issues such as chronic lung diseases, acute respiratory infections, cataracts, blindness, and adverse effects on pregnancy are decreasing due to improvement of indoor air quality. The project activity also helps to prevent illness related to digestive system such as diarrhea, cholera, dysentery, typhoid fever from drinking contaminated water - The introduction of locally manufactured technology with improved drinking water quality helps in technological self-reliance in the area
Location of stakeholders	All the stakeholders are operating and living in the area of project activity which is in the geographical boundary of in Viet Nam country.
Location of resources	Have no change in location of resource during the monitoring period. - WP user: they still freely access to local forest around their household to collect wood fuel.

	- Local vendor: They still can supply wood in the project area. - Women Union and local NGOs and government: They have no change in structure & functionality, they are still operating in Vietnam and access to the same resources
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2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	The PP is maintaining ongoing communication with stakeholders through different measures. 1) During the monitoring survey, project has taken the chance to update information to different stakeholders, and collected comments through interviews, surveys, direct observations, group discussions. The PP also conducts and reports the monitoring result from the random sampling to all stakeholders on annually basis. 2) The local (village, commune) Women Union often visit the households and report the status of using water purifier to higher level of Women Union. Staff of SIPCO and Women Union of the villages communicates & collects end-users' comments through regular visits/ phone calls to household at least 1 time per year. 3) Through monitoring survey trip, the field team managers also actively organize and conducts group discussions with different stakeholders The data from these interactions is compiled into annual reports and updated to the Women Union & local governmental authority. Through the ongoing communication process, all the implementation information, such as the results of monitoring, the risks, costs and benefits the project and the plan of site visit from verification body has been updated timely to the stakeholders. In addition, the PP also updates workers on relevant law and applicable regulation (if any) and conduct additional educational services as requested by the beneficiary.
Date(s) of stakeholder consultation	• 18 April 2021, the date of initial stakeholder consultation meeting for grouped project.

	06 to 18 January 2025, the date to conduct ongoing consultation & conduct sampling survey at the same time 20 January 2025, SIPCO sends the report of this monitoring period to provincial's Women Union.
Communication of monitored results	The monitored results have been shared with Woman Union & relevant stakeholders through annual reports include the information of 1) The list of households has been selected for survey 2) The summarize of the result of SIPCO's representative sample conduct survey.
Consultation records	All formal consultation is logged in the consultation forms. Forms are saved for record of correspondence
Stakeholder input	During this ongoing communication, there was no comment received from stakeholder for the water purifiers quality and design for the current monitoring period.

2.1.3 Free, Prior, and Informed Consent

Consent	The project activities take place with the approval of Commune People's Committee in a series of consultation meetings as documented. In addition, WPs is a completely voluntary activity and households in participating villages are free to choose whether they take part or not. Free, prior, and informed consent takes place before installation.
Outcome of FPIC	The project activity involves distribution of water purifiers to individual households and it has not encroached on land, relocated people. All of the information is transparency.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
There is no the grievance raised during this monitoring period.	If any grievance is received, then the field staff is responsible to address the grievance within 15 days of record according to the grievance mechanism process below. If there is a major grievance which is recorded, then

the technical team is responsible to handle the grievance and report to the management.

The end user approaches the women union of commune in case of any complaint/ issues with the distributed water purifier. The women union of commune further conveys it to the women Union of higher level. The women union of province communicates to SIPCO. Representative from SIPCO attend this complaint/ issue and get it rectified as per process below.



• Receive Grievance

The grievance could be received by all means, such as in person/over the phone, via email/website. The grievance register is being maintained by the distributors for submission of input/ grievance (if any) related to the project activity. The queries by stakeholders are noted and documented in the grievance register. In addition, the contact details of the project proponent and local representative/ partner of the project proponent are also provided to the stakeholder's for sharing suggestions/ queries either through call/messaging/ e-mailing. The grievance register is kept at SIPCO, Women Union and 30 local partner offices where any stakeholder can come and register his/her feedback. Total 32 grievance register is kept at address as following:

Name of organization	Address	Phone number	Contact person	Email
SIPCO	6 th Floor, Hop Long Building, No.1, 59 Lang Ha Street, Ba Dinh District, Hanoi.	+842435190955	Pham Ngoc Nhan	info@carbonvietnam.com
Viet Nam Women Union (WU)	39 Hang Chuoi, Hoan Kiem, Hanoi.	+842439719915	Ms. Pham Thi Ha	hatwhoi@yahoo.com

Tuyen Quang's WU	No.65, 17/8 Street, Minh Xuan Ward, Tuyen Quang City	+84 948096278	Chu Thi Mai Huong	vanphongpntq@gmail.com
Nam Dinh's WU	70 Tran Phu, Nam Dinh City.	+84 979643718	Nguyen Thi Minh Ha	Ntmha.hlpnt@namdi nh.gov.vn
Lai Chau's WU	4th floor - Building C, provincial center, Tan Phong Ward, Lai Chau City.	+84 986679464	Hoang Thi Hien	vppnlc@gmail.com
Dien Bien's WU	Muong Thanh Ward, Dien Bien Phu City.	+84 917336134	Nong Thi Thinh	phongtonghoppndb@g mail.com
Lao Cai's WU	Building A, 4th floor, headquarters Block 3, Nam Cuong ward, Lao Cai city.	+84 972710808	Dao Phuong Thuy	contact- hpn@laocai.gov.vn
Son La's WU	Group 8, Chieng Le Ward, Son La City	+84 2123858413	Bui Thanh Thuy	thanhthuy020372@g mail.com
Quang Ninh's WU	5th Floor, Inter-agency Building No. 4, Hong Ha Ward, Ha Long City	+84 2033 623589	Bui Thi An Dung	lhpn@quangninh.gov.vn
Bac Ninh's	No. 122 Ngo Gia Tu, Suoi Hoa Ward, Bac Ninh City..	+84 2223870687.	Nguyen Phuong Mai	
Ha Nam's WU	No. 102, Le Cong Thanh Street, Tran Hung Dao Ward, Phu Ly City	+84 2263841901	Tran Thi Binh	vanphongpnhn@gmail.c om
Vinh Phuc's WU	No. 8, Truong Chinh Street, Dong Da Ward, Vinh Yen City	+84 989885411	Nguyen Thi Kieu Anh	vanphongth.pnvp@gmai l.com
Quang Binh's WU	Van Cao Street - Dong Hoi City - Quang Binh Province	+84 2323822461	Tu Thi Le Ninh	webhoipnqb@gmail.co m
Phu Yen's WU	01 Nguyen Truong To, Ward 6, Tuy Hoa City, Phu Yen Province	+84 2573823425	Nguyen Thi Minh Thuy	banbientap.hoilhpnphu yen@gmail.com

Dak Lak's WU	No. 21 Truong Chinh Street, Buon Ma Thuot City.	+84 5003959017	To Thi Tam	bdtphunudaklak@gmail.com
Kon Tum's WU	678 Tran Phu, Kon Tum city, Kon Tum province	+84 2603861752	Y Phuong	yphuongubmtkt@gmail.com
Lam Dong's WU	No. 61 Quang Trung, Ward 9, Da Lat City, Lam Dong Province	+84 2633822380	Pham Thi Anh Tuyet	tuyetphong2011@gmail.com
Ha Tinh's WU	No. 98, Phan Dinh Phung Street, Tan Giang Ward, Ha Tinh City	+84 941097868	Bien Thi Thu Huyen	hoiphunu_hatinh@yahoo.com.vn
Quang Tri's WU	No. 11 Hai Ba Trung, Ward 1, Dong Ha City, Quang Tri Province	+84 913419685	Le Thi Thanh Huyen	huyenttng@gmail.com
Gia Lai's WU	01 A Pham Van Dong, Pleiku City, Pleiku City, Gia Lai	+84 2693824330	Dang Thi Thanh Binh	vanphongpngl@yahoo.com
Lang Son's WU	Van Cao Street, Chi Lang Ward, Lang Son City, Lang Son Province.	+84 2053810305	Nong Thanh Hai	vanphongphunulangson@gmail.com
Ha Giang's WU	No. 3, 20/8 Street, Nguyen Trai Ward, Ha Giang City, Ha Giang Province	+84 948206620	Tran Thi Phuong Thuy	Ttpthuy.hlhpnth@hagian.gov.vn
Hai Duong's WU	Do Ngoc Du Street, Tan Binh Ward, Hai Duong City	+84 3203897590	Tran Thi Thanh Thao	
Hung Yen's WU	Square Street, Hien Nam Ward, Hung Yen City, Hung Yen Province	+84 2213863711	Doan Thi Nguyet	hlhpntinhhungyen@gmail.com
Thua Thien Hue's WU	12 Dong Da, Vinh Ninh Ward, Hue City, Thua Thien Hue Province	+84 2343822144	Tran Thi Kim Loan	vanphong.hlhpnthth@gmail.com

Quang Nam's WU	No. 18 Tran Phu, Tam Ky City, Quang Nam Province	+84 2353852778	Dang Thi Le Thuy	lethuyphnqnam@gmail.com
Quang Ngai's WU	279 Quang Trung - Quang Ngai City, Quang Ngai Province	+84 553826973	Le Na	hoiphunutinh@quangngai.gov.vn
Binh Thuan's WU	23 Tran Hung Dao, Phan Thiet street, Binh Thuan City	+84 2523821668	Le Thi Hai Yen	hlhpn@binhthuan.gov.vn
Khanh Hoa's WU	No. 02 Ngo Quyen, Van Thanh ward, Nha Trang city, Khanh Hoa province.	+84 2583561020	Nguyen Quynh Nga	banbientappnkh@gmail.com
Ninh Thuan's WU	Phan Chu Trinh Street, Ward 6, My Binh Ward, Phan Rang Thap Cham City, Ninh Thuan Province.	+84 2593823975	Pham Thi Ngan Hanh	nganhanhphan79@gmail.com
Dak Nong's WU	No. 02, No Trang Long, Nghia Duc Ward, Gia Nghia City, Dak Nong	+842 613546817	H'Vi EBan	banbientap@gmail.com
Bac Kan's WU	Group 8a, Duc Xuan Ward, Bac Kan City, Bac Kan Province	0961662558	Nong Thi Le	hoiphunu@backan.gov.vn

- Record**

All formal grievances are 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 are 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 is acknowledged, the grievance owner, within two working days of a grievance being submitted. Communication is made either verbally or in written form.

The acknowledgement of a grievance should include a summary of the grievance, method that is taken to resolve the grievance and an estimated timeframe in which the grievance is 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 analyzed and 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 uses 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 then formally advise the external stakeholder via their preferred method of contact.

- **Follow up and close out**

The grievance owner 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 is 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.

The procedure is accessible to stakeholders for ongoing consultation, but there is no any grievance received in this monitoring period.

In addition, SIPCO also allows considers and integrates traditional methods stakeholders use for conflict resolution including:

- Informing Women Union at levels.
- Social media communications are crucial to stay engaged with a variety of stakeholders. Below mentioned mechanism will be used by stakeholders to communicate their grievances with the Project owner:
 - Communication via phone call (+84) 243 519 0955 or email info@carbonvietnam.com

2.1.5 Public Comments

Summary of comments received	Actions taken
There were no negative or adverse comments received from stakeholders in this monitoring period	Not applicable

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

SIPCO has many years of experiences in implementing similar project activities and engaging communities. We have policies in place to inform management and employees about the avoidance of corruption, code of conduct, and business ethics. These policies are applied by all project staff, including company management to ensure that the organization is run in accordance with all legal requirements and is held to the highest standards of operation.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' well-being	No risk identified	The project activity involves distribution of water purifier to individual household. There is no trade-off or any negative impact to their livelihood, land, food, etc. therefore, no any risk identified to stakeholder well-being.
Risks to stakeholder participation	No risk identified	The project activity involves distribution of water purifier to individual household. Therefore, no any risk identified to stakeholder participation
Working conditions	No risk identified	Project activities create jobs for local people, help them from unemployed to employed. All of working condition such as working hour, clothes, environment... as per Viet Nam's Labor Law.

		therefore, no any risk identified to working condition
Safety of women and girls	No risk identified	The project activity help reduce the proportion of time rural women spend on unpaid domestic work related to collection of firewood, Therefore, no any risk identified relate to safety of women and girls.
Safety of minority and marginalized groups, including children	No risk identified	The project alleviates the work burden of children and minority and marginalized grouped as they have to spend less time to collect firewood for cooking. Therefore, no any risk identified relate to safety of minority and marginalized grouped
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	The project activity involves distribution of water purifiers to individual household. The project activity reduce air pollutants from wood smoke and improve the air quality indoor.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁴	Mitigation or preventative measure(s) taken
Discrimination	No risk identified	Discrimination has no place in SIPCO's work environment. No one shall be discriminated against based on personal characteristics or beliefs such as gender, age, religion, marital status, race,

⁴ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

		caste, social background, disease, disability, pregnancy, ethnic and national origin, nationality, membership in worker organizations including unions, political affiliation, sexual orientation, or similar. All employees must always be treated strictly according to his or her abilities and qualifications in any employment decision. SIPCO supports diversity, inclusion, and equity with attention to vulnerable populations, including women and children. In Viet Nam, just like in the developing world in general, women continue to form a large majority of the working poor, earn less income, and are more often affected by under- and un-employment and precarious working conditions than men. Women in Viet Nam are principally found in lower paid occupational sectors or in vulnerable employment.
Sexual harassment	No risk identified	As part of our commitment to having a diverse and inclusive workplace, we have zero tolerance for harassment and bullying.
Gender equity in labor and work	No risk identified	The project also encourages women in the local communities to take up employment as per their skills, and provide training to all staff regardless of gender. The company as per its human resource policy ensures fair opportunity and equal pay for equal work done to both men and women. Furthermore, the project activity provides more

		opportunities to women through self-help groups, thus helping in overall women empowerment
Forced labor	No risk identified	SIPCO does not tolerate child labor or forced, involuntary or trafficked labor in any form. Victimization at work, such as recurring negative actions directed against individual employees, is not permitted. All employees shall treat one another with respect, dignity and common courtesy.
Child labor	No risk identified	
Human trafficking	No risk identified	

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The contractor, synonymous with implementing partner, enters into an independent contractor agreement with SIPCO. The agreement contains details of SIPCO's and the contractor's compliance according to Viet Nam labor laws. Specific information is provided on anti-terrorism and anti-corruption efforts, including a code of conduct. Per the Core Labour Conventions of the International Labour Organization (ILO), SIPCO respects, and works in tandem with the elimination of all forms of forced or compulsory labour, the effective abolition of child labour, minimum age convention, the right to organize, and the elimination of discrimination in respect of paid positions and occupation.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	The project activity involves distribution of water purifiers to individual households and it is not involving any indigenous peoples and cultural heritage.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The project activity involves distribution of water purifiers to individual households and it is not involving any property right removal/relocation of property rights holders.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	The project activity does not impact the benefit sharing so this section is not applicable
Benefit sharing during the monitoring period	The project activity does not impact the benefit sharing so this section is not applicable

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	The implementation of the grouped project does not impose any severe impacts on the ecological system in the surrounding areas. This project activity helps in reducing the consumption of fuel wood by efficient fuel combustion thereby reducing deforestation and reducing indoor air pollution. The use of clean water technology reduce adverse environmental and social impacts associated with the use of non-renewable biomass. The reduced
Soil degradation and soil erosion	No risk identified	
Water consumption and stress	No risk identified	

		consumption of the stated baseline fuel has sustainable benefit for all household's traditional cook stoves users included in the project activity. The implementation of the project reduce workloads involved in fuel collection, and by reducing indoor air pollution, reduce the risk of respiratory diseases, especially for women and children. Water purifiers also contribute to environment protection by reducing biomass consumption and hence greenhouse gas emissions, mainly CO ₂ , when the combusted biomass originates from non-renewable stocks. Therefore, it has no impact to ecosystem health, so this section is not applicable.
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2.4.1 Rare, Threatened, and Endangered species

Species or habitat	It is not applicable since there is no ecosystem impact were identified during validation
Areas needed for habitat connectivity	

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified	The project activity involves distribution of water purifier to individual households and it is not impact to habitat in ecosystem
Areas for habitat connectivity	No risk identified	

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not applicable	N/A	N/A	N/A

2.4.3 Ecosystem conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	It is not applicable since project do not involve any ecosystem conversion.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity aims to distribute WPs in 30 provinces of Viet Nam and until the end of this monitoring period all 364,000 WPs under project activity were distributed. All WPs were transported and gathered in local district's temporary warehouses one week before the start distribution date. From 01 – November - 2021, SIPCO in conjunction with the local partner (Women Union) organized mass distributions in all villages within the district. Women Union has affiliates in every village in all over 30 provinces of Viet Nam, they can quickly identify the households who were using traditional cookstove to boil drinking water and they can select the households that meet the project criteria. The representative of households whose names were on the demand registration list which have been predetermined to be eligible to participate in the project were invited to the distribution's points to attend the communication session and receive WP. All 364,000 WPs under this grouped project were distributed during more than 01 years from 01– November – 2021 to 21 – December – 2022, detail in following:

Table 02: Timeline of project activities (PAs)

Project activity	Steps	Timeline
PA 1	Start date of fifth monitoring period	01 July 2024
	Inclusion date	20 January 2022
	Project start date (the first equipment distributed)	01 November 2021
	Implementation status as on December 2024 (number of SDWPs distributed)	100 WPs were distributed on 01 November 2021 9,846 WPs were distributed from 05 to 08 August 2022

		4,044 WPs were distributed from 10 to 14 November 2022.
PA 2	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	15 April 2022
	Implementation status as on December 2024 (number of SDWPs distributed)	200 WPs were distributed on 15 April 2022 11,800 WPs were distributed from 06 to 15 December 2022
PA 3	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	20 May 2022
	Implementation status as on December 2024 (number of SDWPs distributed)	100 WPs were distributed on 20 May 2022 11,900 WPs were distributed from 05 to 12 Dec 2022
PA 4	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	21 April 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	100 WPs were distributed on 21 April 2022 10,900 WPs were distributed from 01 to 04 December 2022
PA 5	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	18 November 2022
	Implementation status as on December 2024 (number of SDWPs distributed)	14,000 WPs were distributed from 18 to 27 November 2022
	Start date of fifth monitoring period	01 July 2024

PA 6	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	17 May 2022
	Implementation status as on December 2024 (number of SDWPs distributed)	100 WPs were distributed on 17 May 2022 13,900 WPs were distributed from 14 to 18 November 2022
PA 7	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	05 July 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	300 WPs were distributed on 05 July 2022 400 WPs were distributed in 16 August 2022 6,300 WPs were distributed from 10 to 17 December 2022
PA 8	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	04 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	350 WPs were distributed on 04 May 2022 4,414 WPs were distributed from 06 to 08 July 2022 3,339 WPs were distributed on 10 August 2022 7,897 WPs were distributed from 15 to 18 September 2022 01 WP of WP-008-13271 was not operated from January 2024.
PA9	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	21 July 2022
	Implementation status as on 31/12/2024 (number of SDWPs distributed)	100 WPs were distributed on 21 July 2022

		8,900 WPs were distributed from 10 to 13 November 2022
PA10	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	07 July 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	260 WPs were distributed on 07 July 2022 11,740 WPs were distributed from 08 to 14 December 2022
PA11	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	05/06/2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	350 WPs were distributed on 05 June 2022 15,550 WPs were distributed from 07 to 28 October 2022 3,000 WPs were distributed from 12 to 15 November 2022
PA12	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	14 June 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	350 WPs were distributed on 14 June 2022 11,650 WPs were distributed from 10 to 21 September 2022
PA13	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	07 April 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	1,400 WPs were distributed on 07 April 2022 100 WPs were distributed on 09 May 2022

		10,500 WPs were distributed from 03 to 13 October 2022
PA14	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	09 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	100 WPs were distributed in 09 May 2022 11,680 WPs were distributed from 14 to 22 October 2022
PA15	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	09 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	100 WPs were distributed on 09 May 2022 11,900 WPs were distributed from 21 to 26 October 2022
PA16	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	18/04/2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	250 WPs were distributed on 18 April 2022 100 WPs were distributed on 17 June 2022 11,800 WPs were distributed from 01 to 15 October 2022
PA17	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	22 April 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	100 WPs were distributed on 22 April 2022

		12,000 WPs were distributed from 15 to 21 December 2022
PA18	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	09 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	130 WPs were distributed in 09 May 2022 8,580 WPs were distributed from 22 to 29 October 2022
PA19	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	24 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	1,210 WPs were distributed on 24 May 2022 72 WPs were distributed on 10 August 2022 5,335 WPs were distributed from 21 to 24 November 2022 5,383 WPs were distributed from 17 to 21 December 2022
PA20	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	12 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	210 WPs were distributed on 12 May 2022 5,590 WPs were distributed from 02 to 05 October 2022 8,800 WPs were distributed from 08 to 10 November 2022 4,510 WPs were distributed from 02 to 05 December 2022
PA21	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023

	Project start date (the first equipment distributed)	22 July 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	10,000 WPs were distributed from 22 to 26 July 2022
PA22	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	08 June 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	5,000 WPs were distributed from 08 to 20 June 2022 4,000 WPs were distributed from 20 to 23 September 2022
PA 23	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	23 June 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	200 WPs were distributed on 23 June 2022 5,730 WPs were distributed from 24 to 28 September 2022 4,070 WPs were distributed from 13 to 18 October 2022 2,000 WPs were distributed from 15 to 20 November 2022
PA 24	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	23 April 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	100 WPs were distributed on 23 April 2022 270 WPs were distributed on 22 June 2022 11,630 WPs were distributed from 23 to 26 November 2022
	Start date of fifth monitoring period	01 July 2024

PA 25	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	24 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	5,000 WPs were distributed from 24 to 28 May 2022 6,000 WPs were distributed from 07 to 09 Aug 2022
PA 26	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	24 June 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	1,054 WPs were distributed on 24 June 2022 4,839 WPs were distributed on 29 July 2022 2,107 WPs were distributed on 25 September 2022
PA 27	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	20 June 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	490 WPs were distributed in 20 June 2022 11,510 WPs were distributed from 27 to 29 November 2022
PA 28	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	22/06/2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	2,500 WPs were distributed from 22 to 27 June 2022 8,500 WPs were distributed from 26 to 28 September 2022
PA 29	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023

	Project start date (the first equipment distributed)	09 May 2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	• 250 WPs were distributed in on 09 May 2022 • 8,850 WPs were distributed from 04 to 11 October 2022 • 6,050 WPs were distributed from 29 to 30 November 2022
PA 30	Start date of fifth monitoring period	01 July 2024
	Inclusion date	05 June 2023
	Project start date (the first equipment distributed)	21/09/2022
	Implementation status as on 31 December 2024 (number of SDWPs distributed)	• 200 WPs were distributed from 01 to 21 September 2022 • 4,422 WPs were distributed from 13 to 16 November 2022 • 7,378 WPs were distributed from 16 to 19 December 2022

Until the end of this monitoring period, a total of 364,000 water purifiers were installed as part of the project activity. Only one water purifier model (Ecozen -25) was distributed in the project.

CDM methodology AMS III.AV version 08 allows the use of a correction factor of 0.95 applied to the overall emissions reductions to account for any possible leakage. This factor has been applied to the emissions reductions presented in this report.

During the current monitoring period, there was 01 WP was not operated due to broken, there are only 98.11% of WPs that have been operating. There should be no effect on approved monitoring plan.

3.2 Deviations

3.2.1 Methodology Deviations

Not applicable. No methodology deviations were applied.

3.2.2 Project Description Deviations

There are 02 changes made in during this monitoring period as below:

- 1) Change the sample size calculation for parameter m “fraction of functional appliances that are meeting the SDWP Standard” in section 5.3 of registered PD, that were presented in 1st monitoring report and approval on 05 June 2023 as following:

Parameter m

As per Guideline “Sampling and surveys for CDM project activities and programmes of activities”, for the use of a single sampling plan covering a group of PAs, provided the homogeneity of population can be demonstrated, or differences are taken into account in the sample size calculation, a 95/10 confidence/precision is applied for annual sampling. For fraction of functional appliances that are providing the SDWP (m), this is proportion value so 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).

At validation, the Implementer will distribute 28,000 SDWPs and will provide clean drinking water to 28,000 households in Tuyen Quang Provinces. So, the population size, N is taken as 28,000 persons.

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:

$$n \geq \frac{1.96^2 \times 28,000 \times 0.9 (1-0.9)}{(28,000 -1) \times 0.1^2 \times 0.9^2 + 1.96^2 \times 0.9 (1- 0.9)}$$

Which comes out to be

$$n \geq 42.62$$

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) There has been a change about the value of f_{nrB} "Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass". The f_{nrB} is 0.9403, was calculated as per tool30 "Calculation of the fraction of non-renewable biomass" version 03 as per the independent report by third Party. This value was approved in registered PD on 20/01/2022. Since the result is quite high so PPs want a conservative approach. Currently, the tool has been update to version 04, according to the updated tool, the f_{NRB} was recalculated and resulted as 88.13%. The analysis was independently completed by C4 Ecosolutions (Pty) Ltd, below:

The fraction of harvested biomass that can be established as non-renewable biomass is the f_{nrB} . This fraction ranges between 0 and 1, where 0 indicates that 100% of harvested biomass is renewable (0% is non-renewable) and 1 indicates that 100% is non-renewable. The following equation is used to calculate f_{NRB} :

$$f_{NRB} = \frac{NRB}{NRB + RB}$$

Where:

f_{NRB} = Fraction of non-renewable biomass

NRB = Non-renewable biomass (t/yr)

RB = Renewable biomass (t/yr)

The quantity of non-renewable biomass (NRB) is the difference between the annual biomass consumption (H) and the quantity of renewable biomass (RB), calculated by the following equation:

██████████

Where:

H = Total woody biomass consumption in the absence of project activity (t/yr)

- ***Estimating Viet Nam's woody biomass consumption***

The total woody biomass consumption in a country comprises its domestic and non-domestic energy and non-domestic non-energy consumption. For Vietnam, this total is estimated using United Nations Statistics Division consumption data and World Bank population statistics.

The reported volumes of fuelwood consumed in cubic meters are converted to metric tonnes using the FAO default conversion factor. Finally, consumed volumes of commercial forest products – including manufacturing, construction and non-fuel industry – are converted to metric tonnes using a biomass conversion and expansion factor provided for the region

Table 1: Total 2021 population, woody biomass consumption, and per capita consumption estimates for Vietnam.

Variable	Value	Source
Population		
Total	98,168,829	The World Bank ¹¹
Domestic woody biomass consumption		
Fuelwood consumption by households (t/yr)	5,415,879	Calculated
Domestic per capita consumption rates		
Fuelwood households (m ³ /capita/yr)	0.076	Calculated – UN STAT ⁷
Total Non-domestic (energy) wood consumption		
Fuelwood for transformation in charcoal plants (t/yr)	3,410,141	Calculated
Total Non-domestic (non-energy) wood consumption		
Total non-domestic (non-energy) (t/yr)	28,200,198	Calculated
Manufacturing, construction and non-fuel industry (m ³ /yr)	21,509,000	Calculated
Non-domestic per capita consumption per category		
Transformation in charcoal plants (m ³ /capita/yr)	0.076	Calculated – UN STAT ⁷
Manufacturing, construction and non-fuel industry (m ³ /capita/year)	0.221	Calculated – UN STAT ⁷
Conversion factors		
Wood density (t/m ³)	0.725	FAO ¹²
Biomass conversion and expansion factor (t/m ³)	1.300	FAO ¹⁰
Charcoal to wood biomass factor	4	CDM ⁹
Total woody biomass consumption (t/yr)	37,026,218	Calculated

- **Estimating renewable biomass (RB)**

Geospatial data products for Vietnam were analysed in to estimate the country's renewable biomass. The default age-weighted mean annual increment (MAI) estimates of each ecological zone, as reported by the IPCC, were used for this calculation.

Table 2: Total, protected and remote forest cover extent, mean annual increment (MAI) and renewable biomass (RB) by Global Ecological Zone for Viet Nam.

Ecological Zone	Total forest cover (ha)	Protected cover (ha)	Remote cover (ha)	MAI (t/ha/yr)	Renewable biomass (t/yr)
Subtropical humid forest	449,647	13,536	112,574	0.85	274,021
Subtropical mountain system	74,563	327	16,967	0.52	29,494
Tropical dry forest	428,482	61,861	131,524	1.29	304,114
Tropical moist forest	5,105,505	1,236,174	1,373,969	0.84	2,096,596
Tropical mountain system	1,807,758	224,585	786,494	0.27	211,188
Tropical rainforest	3,179,349	501,257	1,598,386	1.31	1,413,108
Tropical shrubland	172,131	28,234	84,494	1.12	66,711
Total	11,217,436	2,065,975	4,104,408		4,395,232

- **The fraction of non renewable biomass (fnrb)**

The fraction of non-renewable biomass is the quotient of the non-renewable and the total biomass. The fraction of non-renewable biomass for Vietnam is, therefore, estimated to be 0.8813.

Table 3: Summary of the fraction of non renewable biomass (fnrb) calculation for Viet Nam

Variable	Value	Source
Total woody biomass consumption (t/yr)	37,026,218	Table 1
Renewable biomass (t/yr)	4,395,232	Table 2
Non-renewable biomass (t/yr)	32,630,986	Calculated
Fraction of non-renewable biomass	0.8813	Calculated

The resulting fNRB value is higher than the expected fNRB values determined using the WISDOM method, as reported by Bailis et al., 2015⁵ for the same region. While direct comparisons between the WISDOM and CDM methodologies are only sometimes appropriate, given the different approaches of the methodologies, the following factors can contribute to variations in the fNRB estimates between the two methods:

- More recent population statistics (2021) for Viet Nam were used in the present study. The more recent data represents an increase in population numbers since the 2009 data utilised by Bailis et al., 2015.
- Updated 2019 FAO forest products statistics were used in the present study, whereas the study conducted by Bailis et al., 2015 used 2013 FAO forest products statistics.
- Different methods are used to determine the accessibility which can result in significant differences in the estimated renewable biomass and consequently the fNRB value.

⁵) Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015). The carbon footprint of traditional woodfuels. Nature Climate Change, 5(3), pp. 266–272

- Mean annual increments (MAI) were calculated using a weighted average based on the forest area of three categories (i.e. primary forests, above 20-year secondary forest, below 20-year secondary forest). Data from the 2019 Refinement of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for 'Above-ground biomass growth rates for different ecological zones' was utilised. As per the Bailis et al., 2015 study, MAI values were derived from a combination of field observations and IPCC values, followed by an estimation of growth rates as a percentage of standing stock. This approach often yields higher MAIs compared to using only IPCC values and may lead to lower estimations of non-renewable biomass (NRB).

The value is calculated as 0.8813, however the uncertainty deduction for fnrb of 0.26 is applied as per the latest version of methodology VMR006, version 1.2⁶. So, the updated fnrb = $0.8813 * (1 - 0.26) = 0.6522$ is applied for ER calculations and monitoring report from this monitoring period as a conservative approach.

This value was approved in second monitoring report on 04 April 2024 and continue to be applied in subsequent monitoring period.

The deviation does not impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario, the project remains in conformance with the applied methodology

3) Because the population under the project activity is not homogeneous but instead consists of several sub-populations which are known to vary (across model and age) so take a stratified random sampling from each of these sub-populations separately is better to simple random sample. Stratification helps to ensure that estimates of a population characteristic are accurate, especially if there are differences amongst the strata. Therefore, during this monitoring period, the project proponent has changed the sampling method from simple random sampling as per the approved PD dated 20 January 2022 to stratified random sampling across age and model. This sampling method is complied with the Guideline: Sampling and surveys for CDM project activities and programmes of activities Version 04.0.

The deviation does not impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario, the project remains in conformance with the applied methodology.

3.3 Grouped Projects

There are not new project activity instances included under this grouped project in this monitoring period.

⁶ chrome-extension://efaidnbmninnbpcjpcglclefindmkaj/https://verra.org/wp-content/uploads/2023/07/VMR0006-v1.2_PDF.pdf

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	QPW _{pp}		
Data unit	Litres		
Description	Average volume of drinking water per person per day		
Source of data	Calculated based on survey Records.		
Value applied	PA	QPW _{pp}	
	PA 1	5.0	
	PA 2	4.98	
	PA 3	5.05	
	PA 4	5.04	
	PA 5	5.12	
	PA 6	5.02	
	PA 7	4.6	
	PA 8	4.82	
	PA 9	4.82	
	PA 10	5.12	
	PA 11	5.15	
	PA 12	5.04	
	PA 13	4.95	
	PA 14	4.88	
	PA 15	5.15	
	PA 16	4.95	
	PA 17	4.99	
	PA 18	5.06	
	PA 19	5.12	

	PA 20	5.10
	PA 21	5.05
	PA 22	4.98
	PA 23	5.02
	PA 24	5.12
	PA 25	4.88
	PA 26	4.45
	PA 27	4.85
	PA 28	5.05
	PA 29	5.13
	PA 30	5.08
Justification of choice of data or description of measurement methods and procedures applied	Survey	
Purpose of Data	Calculation of baseline emissions	
Comments	-	

Data / Parameter	LS
Data unit	Years
Description	Life span of water treatment technologies
Source of data	Manufacturer's specifications
Value applied	10
Justification of choice of data or description of measurement methods and procedures applied	Manufacture specifications
Purpose of Data	-
Comments	Life span of water treatment technologies shall be 10 years.

Data / Parameter	n_{wb}
Data unit	%
Description	Efficiency of water boiling system being replaced
Source of data	Efficiency of the water boiling systems being replaced. Use one of the options below:

	(a) The efficiency of the water boiling system shall be established using representative sampling methods or based on referenced literature values (fraction), use weighted average values if more than one type of systems is encountered; (b) 0.10 default value may be optionally used if the replaced system or the system that would have been used is a three stone fire or a conventional system for woody biomass lacking improved combustion air supply mechanism and flue gas ventilation system that is without a grate as well as a chimney; for the rest of the systems using woody biomass 0.2 default value may be optionally used; (c) 0.5 default value may be used if the replaced system or the system that would have been used is a fossil fuel combusting system.
Value applied	10%
Justification of choice of data or description of measurement methods and procedures applied	This shall be determined based on option (b) detailed under the row above "Source of data" because only households who using three stone fire are taken into account for supplying safe drinking water.
Purpose of Data	Calculation of baseline emissions
Comments	The project proponents will distribute the SDWPs for the households who have used the traditional cookstove to boil water

Data / Parameter	BL _{fuel,i}																					
Data unit	Fraction																					
Description	Proportions of baseline fuel type I (NRB and or fossil fuels)																					
Source of data	Survey																					
Value applied	<table><tr><td>PA</td><td>BL_{fuel,i}</td></tr><tr><td>PA 1</td><td>0.9485</td></tr><tr><td>PA 2</td><td>0.9638</td></tr><tr><td>PA 3</td><td>0.9608</td></tr><tr><td>PA 4</td><td>0.9819</td></tr><tr><td>PA 5</td><td>0.976</td></tr><tr><td>PA 6</td><td>0.985</td></tr><tr><td>PA 7</td><td>0.9266</td></tr><tr><td>PA 8</td><td>0.9459</td></tr><tr><td>PA 9</td><td>0.9544</td></tr></table>		PA	BL _{fuel,i}	PA 1	0.9485	PA 2	0.9638	PA 3	0.9608	PA 4	0.9819	PA 5	0.976	PA 6	0.985	PA 7	0.9266	PA 8	0.9459	PA 9	0.9544
PA	BL _{fuel,i}																					
PA 1	0.9485																					
PA 2	0.9638																					
PA 3	0.9608																					
PA 4	0.9819																					
PA 5	0.976																					
PA 6	0.985																					
PA 7	0.9266																					
PA 8	0.9459																					
PA 9	0.9544																					

	PA 10	0.9548
	PA 11	0.9612
	PA 12	0.9669
	PA 13	0.9759
	PA 14	0.9578
	PA 15	0.9669
	PA 16	0.9789
	PA 17	0.9759
	PA 18	0.9726
	PA 19	0.9458
	PA 20	0.9674
	PA 21	0.9424
	PA 22	0.9392
	PA 23	0.9699
	PA 24	0.9518
	PA 25	0.9578
	PA 26	0.9634
	PA 27	0.9398
	PA 28	0.9459
	PA 29	0.9729
	PA 30	0.9666
Justification of choice of data or description of measurement methods and procedures applied	The baseline survey data show that the major source of fuel is fire wood	
Purpose of Data	Calculation of baseline emissions	
Comments	The baseline scenario established through the survey shows that proportion of the people used traditional stoves using woody biomass to boil water in the absence of the project activity.	

Data / Parameter	fi
Data unit	Fraction
Description	Factor to determine amount of non-renewable fuels
Source of data	Survey Methodology AMS – III.AV (Version 08.0),

Value applied	0.6522
Justification of choice of data or description of measurement methods and procedures applied	The value in registered PD is 0.9403, was calculated according to version 03 of methodological Tool30 “Calculation of fraction of non-renewable biomass”. Since the result is quite high so PPs want a conservative approach. Currently, the tool has been update to version 04, according to the updated tool, the fNRB was recalculated and resulted as 88.13%. The analysis was independently completed by C4 Ecosolutions (Pty) Ltd The value is calculated as 0.8813, however the uncertainty deduction for fnrb of 0.26 is applied as per the latest version of methodology VMR 0006, version 1.2, So, the value of 0.6522 is applied for ER calculations as a conservative approach from this monitoring period For fossil fuel, the default value is 1.0
Purpose of Data	Calculation of baseline emissions
Comments	This value is different from that in PD and it is stated as deviation by mention the section.

Data / Parameter	EF _{projected fossil fuel}
Data unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non – renewable woody biomass.
Source of data	AMS – III.AV, Version 08.0 IPCC, chapter 2, table 2.2
Value applied	85.7
Justification of choice of data or description of measurement methods and procedures applied	As per AMS-III.AV, Version 08.0 and IPCC, Chapter 2, table 2.2
Purpose of Data	Calculation of baseline emissions
Comments	This parameter shall remain fixed for the monitoring periods

Data / Parameter	X _{boil}
Data unit	%

Description	Fraction of the population serviced by the project activity for which the common practice of water purification is or would have been water boiling.		
Source of data	Survey		
Value applied		PA	X _{boil}
		PA 1	0.9909
		PA 2	1
		PA 3	1
		PA 4	1
		PA 5	1
		PA 6	1
		PA 7	1
		PA 8	1
		PA 9	1
		PA 10	1
		PA 11	1
		PA 12	1
		PA 13	1
		PA 14	1
		PA 15	1
		PA 16	1
		PA 17	1
		PA 18	1
		PA 19	1
		PA 20	0.9970
		PA 21	1
		PA 22	1
		PA 23	1
		PA 24	1
		PA 25	1
		PA 26	1
		PA 27	1
		PA 28	1
		PA 29	0.9969

	PA 30	1
Justification of choice of data or description of measurement methods and procedures applied	Survey	
Purpose of Data	Calculation of baseline emissions.	
Comments		

Data / Parameter	P_h	
Data unit	Fraction	
Description	Averaged number of person per household	
Source of data	Survey	
Value applied	PA	P_h
	PA 1	4.5
	PA 2	4.42
	PA 3	4.54
	PA 4	4.61
	PA 5	4.52
	PA 6	4.62
	PA 7	4.51
	PA 8	4.52
	PA 9	4.52
	PA 10	4.81
	PA 11	5.01
	PA 12	4.85
	PA 13	4.63
	PA 14	4.83
	PA 15	4.68
	PA 16	4.65
	PA 17	4.48
	PA 18	4.41
	PA 19	4.56
	PA 20	4.62
	PA 21	4.50

	PA 22	4.55
	PA 23	4.64
	PA 24	4.44
	PA 25	4.48
	PA 26	4.7
	PA 27	4.54
	PA 28	4.58
	PA 29	4.72
	PA 30	4.81
Justification of choice of data or description of measurement methods and procedures applied	Survey	
Purpose of Data	Calculation of baseline emissions .	
Comments	This para is used to calculate parameter P_y	

4.2 Data and Parameters Monitored

Data / Parameter	P_y						
Data unit	Number						
Description	Population who consumes the purified water serviced by the project activity in year y						
Source of data	Survey records						
Description of measurement methods and procedures to be applied	Water purifier distribution database and Monitoring survey records						
Frequency of monitoring/recording	Annual						
Value monitored	PA	Distribution quatity	Operation rate in last MP	Operation rate in this MP	Operation quantity in this MP	P_h	$P_y = N_y \times P_h$
	1	14,000	0.9804	0.9811	13,466	4.5	60,615

	2	12,000	0.9804	0.9811	11,542	4.42	53,040
	3	12,000	0.9804	0.9811	11,542	4.54	54,480
	4	11,000	0.9804	0.9811	10,581	4.61	50,710
	5	14,000	0.9804	0.9811	13,466	4.52	63,280
	6	14,000	0.9804	0.9811	13,466	4.62	64,680
	7	7,000	0.9804	0.9811	6,733	4.51	31,570
	8	16,000	0.9804	26,465	15,390	4.52	72,320
	9	9,000	0.9804	26,465	8,657	4.52	40,680
	10	12,000	0.9804	0.9811	11,542	4.81	57,720
	11	18,900	0.9804	0.9811	18,179	5.01	94,689
	12	12,000	0.9804	0.9811	11,542	4.85	58,200
	13	12,000	0.9804	0.9811	11,542	4.63	55,560
	14	11,780	0.9804	0.9811	11,331	4.83	56,897
	15	12,100	0.9804	0.9811	11,639	4.68	56,628
	16	12,150	0.9804	0.9811	11,687	4.65	56,498
	17	12,100	0.9804	0.9811	11,639	4.48	54,208
	18	8,710	0.9804	0.9811	8,378	4.41	38,411
	19	12,000	0.9804	0.9811	11,542	4.56	54,720
	20	19,110	0.9804	0.9811	18,381	4.62	88,288
	21	10,000	0.9804	0.9811	9,619	4.50	45,000
	22	9,000	0.9804	0.9811	8,657	4.55	40,950
	23	12,000	0.9804	0.9811	11,542	4.64	55,680
	24	12,000	0.9804	0.9811	11,542	4.44	53,280
	25	11,000	0.9804	0.9811	10,581	4.48	49,280
	26	8,000	0.9804	0.9811	7,695	4.7	37,600
	27	12,000	0.9804	0.9811	11,542	4.54	54,480
	28	11,000	0.9804	0.9811	10,581	4.58	50,380
	29	15,150	0.9804	0.9811	14,572	4.72	71,508
	30	12,000	0.9804	0.9811	11,542	4.81	57,720

	<table><tr><td>Total</td><td>364,000</td><td></td><td></td><td>350,118</td><td></td><td>1,679,072</td></tr></table>	Total	364,000			350,118		1,679,072
Total	364,000			350,118		1,679,072		
Monitoring equipment	-							
QA/QC procedures to be applied	A 95 /10 confidence / margin of error is applied for the sampling parameter as per para 22 of Standard: Sampling and surveys for CDM project activities and programmes of activities, Version 08.0							
Purpose of the data	Calculation of baseline emissions							
Calculation method	Calculated by the quantity of water purifiers are distributed x The average of number of person in a household. PPs maintains the database of all water purifiers installed. The number of operating water purifiers have been determined on a sampling basis. Proportion of operational water purifier for this survey is 98.11%. To conservative, the number of project device operating in this monitoring period is calculated by the number of project device operating in last MR x the proportion of operational stove in this survey $N_y = (n_{\text{operational}}/n_{\text{total}})*N_{\text{distributed}}$. Where: N_y = Number of SDWPs in operation $n_{\text{operational}}$: Number of samples in operation n_{total}: Total of samples $N_{\text{distributed}}$ = Number of distributed water purifiers Proportion of operational water purifiers: <table><tr><td>Value in last MP</td><td>Value in this MP</td></tr><tr><td>0.9804</td><td>0.9811</td></tr></table> $N_y = 98.04\%*0.9811*364,000= 350,118$	Value in last MP	Value in this MP	0.9804	0.9811			
Value in last MP	Value in this MP							
0.9804	0.9811							
Comments	In last monitoring period, there are 01 water purifier of WP-008-13271 in stratum – age 2 which was not operated, the operation rate for stratum – age 2 is 0.9804 and stratum – age 3 is 1.0. But in this monitoring period, the stratum of age is change so to conservative, PPs applied the lower operation rate of age 2 for all of water purifiers.							

Data / Parameter	QPW _y
Data unit	litres

Description	Quantity of purified water in year y				
Source of data	Calculated				
Description of measurement methods and procedures to be applied	This parameter can be calculated based on equation: $QPW_y = P_y \times QPW_{pp} \times \text{Number of operating days (184 days for this monitoring period)}$. P_y: Population who consumes the purified water serviced by the project activity QPW_{pp}: Average volume of drinking water per person per day				
Frequency of monitoring/recording	Annual				
Value monitored	PA	P_y	QPW_{pp}	Operating days	QPW_y
	1	60,615	5.0	184	55,749,240
	2	53,040	4.98	184	46,746,651
	3	54,480	5.05	184	48,690,712
	4	50,710	5.04	184	45,235,146
	5	63,280	5.12	184	57,340,943
	6	64,680	5.02	184	57,464,830
	7	31,570	4.6	184	25,701,639
	8	72,320	4.82	184	61,693,856
	9	40,680	4.82	184	34,703,295
	10	57,720	5.12	184	52,301,474
	11	94,689	5.15	184	86,304,366
	12	58,200	5.04	184	51,912,407
	13	55,560	4.95	184	48,672,660
	14	56,897	4.88	184	49,142,021
	15	56,628	5.15	184	51,616,265
	16	56,498	4.95	184	49,497,016
	17	54,208	4.99	184	47,875,360

	18	38,411	5.06	184	34,399,116
	19	54,720	5.12	184	49,583,102
	20	88,288	5.10	184	79,689,134
	21	45,000	5.05	184	40,220,887
	22	40,950	4.98	184	36,093,249
	23	55,680	5.02	184	49,467,572
	24	53,280	5.12	184	48,278,284
	25	49,280	4.88	184	42,563,994
	26	37,600	4.45	184	29,613,130
	27	54,480	4.85	184	46,762,367
	28	50,380	5.05	184	45,029,943
	29	71,508	5.13	184	64,922,667
	30	57,720	5.08	184	51,892,869
	Total				1,489,164,195
Monitoring equipment	-				
QA/QC procedures to be applied	N/A				
Purpose of the data	Calculation of baseline emissions				
Calculation method					
Comments					

Data / Parameter	m
Data unit	fraction
Description	Fraction of functional appliances that are providing the SDWP
Source of data	Microbiological testing certificate of Department on Environmental Quality Analysis Institute of Environmental Technology. The Laboratories has been assessed and found to conform with the requirements of international standards ISO/IEC 17025:2017

	in accordance Certificate of Accreditation of Ministry of Science and Technology Bureau of Accreditation (BoA)
Description of measurement methods and procedures to be applied	For determination of function appliances that providing the SDW, an across PA sampling based on the WP model and its vintage with the applied 95/10 confidence precision level. Total of 43 samples were microbiological testing at Laboratory by third Party and all samples meet requirement following: (i) Using filtration ceramic with Natural Osmosis systems to create safe drinking water. (ii) All SDWPs are operating in good condition. The use of appliances was monitored through self – report measures (survey questionnaires). We surveyed random samples all of physical signs that are observable (e.g. wetness of the unit, water in storage receptacle, functionality of parts). Through survey and physical signs, we can confirm that all SDWPs are operating in good). (iii) All samples meet Microbiological parameters required by QCVN 6-1:2010/BYT for drinking water to deliver treated water verified to be <1cfu/100 ml E.Coli, using methods for measurement with a lower detection limit (LDL) of 1cfu E.Coli per 100 ml sample
Frequency of monitoring/recording	Annually
Value monitored	1
Monitoring equipment	
QA/QC procedures to be applied	Quality of safe drinking water is confirmed by Department on Environmental Quality Analysis Institute of Environmental Technology. This is the third party that conducted the test during monitoring period. The Laboratories have been recognized in accordance with international standards ISO/IEC 17025: 2017. During the sampling plan, the people in charge are required to collect information and records of replacement of appliances, filters and maintenance if any. They will ask the sampled household if their WP has appliances, filter replaced & or have any maintenance activity and records in the sampling records. Later on, they will also cross-check the information with the record database using the serial number of the sampled WP to make sure of the accuracy of the information. However, during this monitoring period, all the sampled WP are in good condition, and there is no maintenance & replacement activity was recorded. Another, during WP usage, if the household detect any defective & abnormal issue with water quality, they will: - Notify SIPCO about defective SDWPs

	- SIPCO will send the appliance or filter cores to the Commune People's Committee and representative of Commune Women's Union will help replace the filter core for the households. - Households must sign the minutes of filter core replacement, and PPs will note in the data base for the next monitoring. The days from find defective filter core to replacement date will be note and VCUs generate from this filter core in this time will be discarded in next monitoring period
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	Emission reductions cannot be claimed if over 10% of appliances in the project activity fail to meet the final water quality requirements mentioned above.

Data / Parameter	Check for SDWP public distribution network
Data unit	-
Description	Annual check if there is a public distribution network supplying SDWP is installed
Source of data	Confirmation from local authorities and survey questionnaires
Description of measurement methods and procedures to be applied	1. Before distribution at new area, the provincial Women Union will send an official letter confirming that the WP distribution locations are places that do not have access to clean water. This confirmation has been provided to VVB for checking in supporting documents. 2. The random survey by questionnaires for end user were used to check if there is a public distribution network supplying SDW is installed. If the household accessed to safe drinking water, the emission reduction will be discarded (according to proportion). Monitoring shall include annual check if there is public distribution network supplying SDW
Frequency of monitoring/recording	Annually
Value monitored	0.9815
Monitoring equipment	-
QA/QC procedures to be applied	-

Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	This condition should be checked annually during the crediting period.

Data / Parameter	Quality of safe drinking water
Data unit	
Description	The quality of the safe drinking water
Source of data	Water Quality testing certificates of Department on Environmental Quality Analysis Institute of Environmental Technology. The Laboratories has been assessed and found to conform with the requirements of international standards ISO/IEC 17025:2017 in accordance Certificate of Accreditation of Ministry of Science and Technology Bureau of Accreditation (BoA)
Description of measurement methods and procedures to be applied	Although as per registered VCS PD, the frequency for this parameter monitoring is one every two years, the quality of safe drinking water is confirmed by Third party annually for better monitor of the water quality. 9 samples for grouped project were sampled and tested. All treated water samples are confirmed to meet requirement of Viet Nam Drinking water Standard.
Frequency of monitoring/recording	Once every two years
Value monitored	1 (all of samples meet requirement)
Monitoring equipment	-
QA/QC procedures to be applied	
Purpose of the data	Calculation of baseline emissions
Calculation method	
Comments	Emission reductions cannot be claimed if project activity fails to meet SDWP standards

4.3 Monitoring Plan

The monitoring procedures and sampling plan for the grouped project is in-line with the procedures outlined of the Standard for Sampling and Surveys for CDM Project Activities and

Programme of Activities (Version 09.0), which refers to the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities (Version 04).

Due to the large number of SDWP distributed as part of the PAs included in the grouped project, it is not economically feasible to monitor each individual SDWP unit distributed. Therefore, representative sampling was undertaken as part of a grouped project - wide Sampling Plan (by grouping and sampling across PAs) that is designed in line with the requirements of the “Sampling and surveys for CDM project activities and programme of activities”, version 04

(a) Objective and reliability requirements

As a rule, the most appropriate confidence/precision levels required by the Sampling Standard will be applied whenever sampling is undertaken. According to para 11 of Sampling Standard, 95/10 reliability is to be applied whenever sampling across a group of instance, which will typically be the case for this grouped project. In the case of conducting instance-specific sampling, the project participants use 90/10 confidence/precision.

The objective of the sampling effort will be to meet the monitoring requirements set forth in the sampling standard (Version 09.0). 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. PP has considered 95/10 confidence/precision sampling to consider 30 PAs under one sampling frame. This will be applicable to instance types as long as homogeneity can be demonstrated. When homogeneity cannot be demonstrated the PP may monitor instances individually. All monitoring shall be coordinated by the PP.

Sampled parameters.

Parameter	Description of parameter	Monitoring frequency
P _y	Population who consumes the purified water serviced by the project activity in year y	At least annually
Check for SDWP 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 year

(b) Target population

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

(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”, version 09 and Guideline for Sampling and Surveys for CDM Project, version 04.

To determine the parameters, sampling survey has been involved the following approaches (outcome in brackets):

P_y, check for SDWP public distribution network: Visual inspection of the premises to see if SDWP is operational and in use. Interview with end user if required to verify that SDWP is still in use (Yes/No).

m, water quality: These are monitoring parameters and testing has also been performed by third party.

Using the formulas as given in the section “Sample Size” below, the CME has randomly sampled the required number of SDWPs from the primary sampling units.

(d) Sample size

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

According to footnote 8 of the “Standard for sampling and surveys for CDM project activities and programme of activities”, version 09 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.

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.

Parameter P_y and the fraction of SDWP public distribution network

To estimate the sample size for parameters P_y and check for SDWP public distribution network, the equation that will be used is:

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

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

For this parameter, during the previous monitoring period, the value is 1.0 so based on previous experience, PPs used an estimated value of 0.9 for this 4th monitoring period as the sample size calculation with a value of 1.0 is not possible.

Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated for total population size, the result below:

Monitoring parameter(s)	Water purifier Operating Fraction for determination of P_y and check for SDWP public distribution network			
Sampling frame(s)	Given water purifier model and age population			
Sampling approach	Stratified random sampling across water purifier model and age			
Sampling Population (Batch)	Water Purifier population	Expected operational proportion)	Calculated Sample Size (n)	Actual Monitored sample size
Ecozen age 4	100	0.90	1	2
Ecozen age 3	363,899	0.90	42	52
Sample size determination				
Estimated Operation (p)			0.90	
$V_{operation} = p(1-p)/p^2$			0.111	
Sample Size required (SOF)			43	

Additionally, as per registered sampling plan, it's recommended that the CME may choose to use the same samples to monitor more than one parameter, where parameters have same units. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs. At the same time this approach ensures the random selection of samples for every parameter. Also, oversampling is strongly encouraged, not only to compensate for any attrition, outliers or nonresponse associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved and additional sampling efforts would be required. We expect the response rate from the sampled households to be 80%. Thus, we would decide to sample $43/0.8 = 54$ samples. A total of 54 samples were selected.

Parameter m

For Fraction of functional appliances that are meeting the SDWP Standard (m), this is proportion value so the equation that will be used is:

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

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

During the previous monitoring period for this parameter, the value is 1.0 so based on previous experience, PPs used an estimated value of 0.9 for this 4th monitoring period as the sample size calculation with a value of 1.0 is not possible.

Based on the above assumptions, the resulting sampling size for a 95/10 confidence/precision is calculated for total population size, the result below:

A total sample size for parameter m is 43 samples.

Monitoring parameter(s)	Function fraction (m)
Sampling frame(s)	Given water purifier model and age population
Sampling approach	Stratified random sampling across water purifier model and age

Sampling Population (Batch)	Water Purifier population	Expected operational proportion	Calculated Sample Size (n)
Ecozen age 4	100	0.90	1
Ecozen age 3	363,899	0.90	42
Sample size determination			
Estimated Operation (p)			0.90
V _{operation} = p(1-p)/p ²			0.111
Sample Size required (SOF)			43

Since parameters P_y, check for SDWP public distribution network and m share the same sampling units, CME may choose to have one common survey for these two parameters. Other hand, to save cost for testing parameter m, we will choose 43 samples available for parameter m from 54 samples of parameter P_y.

Quality of safe drinking water

Water quality monitoring will be undertaken annually or biennially on a sampling basis. This will comply with relevant national standards. To ensure compliance of the water quality with: (i) at a minimum the “interim” performance target as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011); or (ii) an applicable national standard or guideline, the water quality shall be monitored on sample basis for contamination with Escherichia coli (E. coli). A test for E. coli colony forming units (CFU) in 100 ml of water or an equivalent quantitative test for E. coli CFU shall be used. The fraction of water quality measurements providing water of insufficient quality shall be excluded from the calculation of emission reductions.

For water quality, the equation that will be used is:

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

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

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

For the mean value, the desired reliability is expressed in relative terms to the mean. In the previous monitoring period, the mean value is 1.0 so based on previous experience, PPs used an estimated value of 0.9 for this 5th monitoring period as the sample size calculation with a value of 1.0 is not possible. On the other hand, the standard deviation is 0% in the previous monitoring period so PPs used an estimated value of 10% is expected standard deviation for this monitoring period as the sample size calculation with a value of 0% is not possible.

$$n \geq \frac{1.96^2 \times 363,999 \times (0.09/0.9)^2}{(363,999 - 1) \times 0.1^2 + 1.96^2 \times (0.09/0.9)}$$

Using above values, the sample size comes out to be 3.84, its rounded off to be 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))

Monitoring Parameter	Water Quality				
Sampling approach	Stratified random sampling based on water purifier's model and age				
Sampling Population (Batch)	Population Size	Expected Mean	Expected Standard Deviation	Calculated Sample Size	Actual Monitored sample size
Ecozen age 4	100	0.9000	0.090	1	2
Ecozen age 3	363,899	0.9000	0.090	6	7
Sample size determination					
Mean				0.9000	
Standard Deviation (SD)				0.0900	
$V_{\text{mean}} = (SD/\text{mean})^2$				0.01000	
Minimum Sample Size required				4	
tDistribution sample size adjustment			Iteration 1	11	

	Iteration 2	5
	Iteration 3	8
	Iteration 4	6
	Iteration 5	7
	Iteration 6	6

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):

The adjusted sample size obtained after applying Student's t-distribution is 7. We expect the response rate from the sampled households to be 80%. Thus, we would decide to sample $7/0.8 = 9$ samples.

(e) Analysis of data collected and confidence/precision achieved

Analysis of the data monitored through sampling revealed the following results:

Parameters P_y

RESULT FOR OPERATION FRACTION P_y			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Operation
Ecozen age 3	363,899	52	0.9811
Ecozen age 4	100	2	
Reliability Check			
Samples Monitored			54
Utilization Measured			0.9811
Standard Error of Utilization			0.25%
Relative precision (Margin of error)			0.51%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

Parameter check of SDWP public distribution network

RESULT FOR PUBLIC WATER SUPPLY SYSTEM FRACTION			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored Operation
Ecozen age 3	363,899	52	0.9815
Ecozen age 4	100	2	
Reliability Check			
Samples Monitored			54
Utilization Measured			0.9815
Standard Error of Utilization			0.25%
Relative precision (Margin of error)			0.50%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

Parameters m

RESULT FOR MICROBIOLOGICAL PARAMETER			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored microbiological quality fraction (m)
Ecozen- 25 - Age 3	363,899	42	1
Ecozen- 25 - Age 4	100	1	
Reliability Check			
Samples Monitored			43
Utilization Measured			1.00
Standard Error of Utilization			0.00%
Relative precision (Margin of error)			0.00%
Result			Ok, reliability level met
Lower Bound confidence value			Not applicable

Parameter water quality

RESULT FOR WATER QUALITY			
Sampling Population	Sampling frame size	Monitored Sample Size	Monitored water quality fraction
Ecozen- 25 - Age 3	363,899	7	1
Ecozen- 25 - Age 4	100	2	

Reliability Check	
Samples Monitored	9
Utilization Measured	1.00
Standard Error of Utilization	0.00%
Relative precision (Margin of error)	0.00%
Result	Ok, reliability level met
Lower Bound confidence value	Not applicable

For detailed calculations refer ER calculator sheet.

(f) Implementation plan

Survey Implementation Schedule:

The survey for collecting the details of monitoring parameters were conducted from 06 to 18 January 2025 for this monitoring period.

The overall monitoring and the implementation of the sampling was co-ordinated by the project proponent and the management staff. They ensure successful monitoring of the emission reductions of the proposed project during its crediting period. Furthermore, the survey of the representative sample for the parameters are carried out by the distributor together with the project proponent.

The survey method has been used by project proponent include:

- (a) Hard-copy questionnaires
- (b) Face to face interview

The monitoring survey included several questions to support the information on the key monitoring parameters. These included visual inspections to confirm water purifier use comments by surveyors, check of randomly selected households against actual household information. These strategies aimed at minimizing surveyor or non-response biases. The questionnaire was piloted in the field prior to implementation

All sampling efforts were conducted by qualified personnel who have professional qualifications from College or above and undergone training as part of the grouped project. A total of 10 received training for the ongoing monitoring and sampling activities on 10 November 2024. They also have at least one year of experience in similar sampling in other projects. Any samplers will be required to speak the native language(s) such as ethnic minority languages with support of local Women Union in which water purification systems have been implemented, allowing for full understanding of any responses given by users, and any questions therein.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times m \times X_{boil} \times SEC \times \sum_i (BL_{fuel,i} \times f_i \times EF_{projected\ fossil\ fuel,i} \times 10^{-9})$$

Where:

BE_y	: Baseline emissions during the year y in (tCO ₂ e)
QPW_y	: Total quantity of purified water by the project in year y (litres). Detail in ER sheet.
m	: Fraction of functional appliances that are meeting the SDWP standards (%). Only project appliances that (i) use technologies that meet the technology standards as per paragraph 4(b) and (ii) are operating or replaced by an equivalent in service appliance and (iii) deliver microbiologically safe drinking water, are counted for emission reductions.
X_{boil}	: Fraction of the population served by the project activity for which the common practice of water purification is or would have been water boiling. This shall be determined ex-ante through surveys.
SEC	: Specific energy consumption required to boil one litre of water(kJ/L) to be calculated according to paragraphs below
$BL_{fuel,i}$	: Proportions of baseline fuel type i (NRB and/or fossil fuels)used in the absence of the project activity (fraction)
f_i	: Fraction of non-renewable fuel type i used in the absence of the project activity in year y. For biomass it is the fraction of woody biomass that can be established as non-renewable biomass (f _{NRB}). If the baseline fossil fuel, the value to be applied is 1
$EF_{projected\ fossil\ fuel,i}$	: Emission factor of the fossil fuel substituted (tCO ₂ /TJ).

The grouped project distributed 364,000 water purifiers for households in 30 provinces in Viet Nam. According to the results of a random survey of households in each project activity, the result the parameter QPW_{pp} X_{boil} , $BL_{fuel,i}$ and P_h for each project activity instance as following:

Project activity	P_h	QPW_{pp}	X_{boil}	$BL_{fuel,i}$
PA 1	4.5	5.0	0.9909	0.9485
PA 2	4.42	4.98	1	0.9638
PA 3	4.54	5.05	1	0.9608
PA 4	4.61	5.04	1	0.9819
PA 5	4.52	5.12	1	0.976
PA 6	4.62	5.02	1	0.985
PA 7	4.51	4.6	1	0.9266
PA 8	4.52	4.82	1	0.9459
PA 9	4.52	4.82	1	0.9544
PA 10	4.81	5.12	1	0.9548
PA 11	5.01	5.15	1	0.9612
PA 12	4.85	5.04	1	0.9669
PA 13	4.63	4.95	1	0.9759
PA 14	4.83	4.88	1	0.9578
PA 15	4.68	5.15	1	0.9669
PA 16	4.65	4.95	1	0.9789
PA 17	4.48	4.99	1	0.9759
PA 18	4.41	5.06	1	0.9726
PA 19	4.56	5.12	1	0.9458
PA 20	4.62	5.10	0.9970	0.9674
PA 21	4.5	5.05	1	0.9424
PA 22	4.55	4.98	1	0.9392
PA 23	4.64	5.02	1	0.9699
PA 24	4.44	5.12	1	0.9518
PA 25	4.48	4.88	1	0.9578

PA 26	4.70	4.45	1	0.9634
PA 27	4.54	4.85	1	0.9398
PA 28	4.58	5.05	1	0.9459
PA 29	4.72	5.13	0.9969	0.9729
PA 30	4.81	5.08	1	0.9666

These value is less than the maximum quality of drinking water person per day of 5.5l/person/day according to para 18 of AMS III AV, version 08.0. So, the quantity of purified water in year is

$QPWy = Py \times \min(QPWpp; 5.5) \times 365 \times \text{Proportion active days in year}$

Result for each PA depend on number of distributed water purifiers and proportion activity days in a year, detail below:

Name of CPA	Distribution Quantity	Age	Operational rate in last MP	Operational rate in this MP	Operational quantity	QPWy
PA 1	13,900	3	0.9804	0.9811	13,370	55,351,800
PA 1	100	4	0.9804	0.9811	96	397,440
PA 2	12,000	3	0.9804	0.9811	11,542	46,746,651
PA 3	12,000	3	0.9804	0.9811	11,542	48,690,712
PA 4	11,000	3	0.9804	0.9811	10,581	45,235,146
PA 5	14,000	3	0.9804	0.9811	13,466	57,340,943
PA 6	14,000	3	0.9804	0.9811	13,466	57,464,830
PA 7	7,000	3	0.9804	0.9811	6,733	25,701,639
PA 8	16,000	3	0.9804	0.9811	15,390	61,693,856
PA 9	9,000	3	0.9804	0.9811	8,657	34,703,295
PA 10	12,000	3	0.9804	0.9811	11,542	52,301,474
PA 11	18,900	3	0.9804	0.9811	18,179	86,304,366
PA 12	12,000	3	0.9804	0.9811	11,542	51,912,407
PA 13	12,000	3	0.9804	0.9811	11,542	48,672,660
PA 14	11,780	3	0.9804	0.9811	11,331	49,142,021
PA 15	12,100	3	0.9804	0.9811	11,639	51,616,265
PA 16	12,150	3	0.9804	0.9811	11,687	49,497,016
PA 17	12,100	3	0.9804	0.9811	11,639	47,875,360
PA 18	8,710	3	0.9804	0.9811	8,378	34,399,116
PA 19	12,000	3	0.9804	0.9811	11,542	49,583,102
PA 20	19,110	3	0.9804	0.9811	18,381	79,689,134
PA 21	10,000	3	0.9804	0.9811	9,619	40,220,887

PA 22	9,000	3	0.9804	0.9811	8,657	36,093,249
PA 23	12,000	3	0.9804	0.9811	11,542	49,467,572
PA 24	12,000	3	0.9804	0.9811	11,542	48,278,284
PA 25	11,000	3	0.9804	0.9811	10,581	42,563,994
PA 26	8,000	3	0.9804	0.9811	7,695	29,613,130
PA 27	12,000	3	0.9804	0.9811	11,542	46,762,367
PA 28	11,000	3	0.9804	0.9811	10,581	45,029,943
PA 29	15,150	3	0.9804	0.9811	14,572	64,922,667
PA 30	12,000	3	0.9804	0.9811	11,542	51,892,869

The baseline emissions shall be calculated as follows:

$$BE_y = QPW_y \times m \times X_{boil} \times SEC \times \sum_i (BL_{fuel,i} \times f_i \times EF_{projected fossil fuel,i} \times 10^{-9})$$

Result as following:

PA	QPW _y	m	X _{Boil}	BL _{fuel,i}	SEC	f _i	EF _{fossil fuel,i}	BE _y
PA 1	55,749,240	1	0.9909	0.9485	3574.8	0.6522	85.7	10,275
PA 2	46,746,651	1	1	0.9638	3574.8	0.6522	85.7	8,836
PA 3	48,690,712	1	1	0.9608	3574.8	0.6522	85.7	9,175
PA 4	45,235,146	1	1	0.9819	3574.8	0.6522	85.7	8,711
PA 5	57,340,943	1	1	0.976	3574.8	0.6522	85.7	10,975
PA 6	57,464,830	1	1	0.985	3574.8	0.6522	85.7	11,100
PA 7	25,701,639	1	1	0.9266	3574.8	0.6522	85.7	4,670
PA 8	61,693,856	1	1	0.9459	3574.8	0.6522	85.7	11,444
PA 9	34,703,295	1	1	0.9544	3574.8	0.6522	85.7	6,495
PA 10	52,301,474	1	1	0.9548	3574.8	0.6522	85.7	9,793
PA 11	86,304,366	1	1	0.9612	3574.8	0.6522	85.7	16,269
PA 12	51,912,407	1	1	0.9669	3574.8	0.6522	85.7	9,844
PA 13	48,672,660	1	1	0.9759	3574.8	0.6522	85.7	9,315
PA 14	49,142,021	1	1	0.9578	3574.8	0.6522	85.7	9,231
PA 15	51,616,265	1	1	0.9669	3574.8	0.6522	85.7	9,788
PA 16	49,497,016	1	1	0.9789	3574.8	0.6522	85.7	9,502
PA 17	47,875,360	1	1	0.9759	3574.8	0.6522	85.7	9,163
PA 18	34,399,116	1	1	0.9726	3574.8	0.6522	85.7	6,561
PA 19	49,583,102	1	1	0.9458	3574.8	0.6522	85.7	9,197
PA 20	79,689,134	1	0.9970	0.9674	3574.8	0.6522	85.7	15,073
PA 21	40,220,887	1	1	0.9424	3574.8	0.6522	85.7	7,433

PA 22	36,093,249	1	1	0.9392	3574.8	0.6522	85.7	6,648
PA 23	49,467,572	1	1	0.9699	3574.8	0.6522	85.7	9,409
PA 24	48,278,284	1	1	0.9518	3574.8	0.6522	85.7	9,012
PA 25	42,563,994	1	1	0.9578	3574.8	0.6522	85.7	7,995
PA 26	29,613,130	1	1	0.9634	3574.8	0.6522	85.7	5,595
PA 27	46,762,367	1	1	0.9398	3574.8	0.6522	85.7	8,619
PA 28	45,029,943	1	1	0.9459	3574.8	0.6522	85.7	8,353
PA 29	64,922,667	1	0.9969	0.9729	3574.8	0.6522	85.7	12,349
PA 30	51,892,869	1	1	0.9666	3574.8	0.6522	85.7	9,837
Total								280,667

5.2 Project Emissions

The operation of WP does not involve consumption of fossil fuels and electricity, So, there is no project emissions considered.

5.3 Leakage Emissions

Where relevant leakage relating to the non-renewable woody biomass is assessed as per the relevant procedures of AMS-I. E version 12.0 explained below:

Leakage emissions related to the non – renewable woody biomass saved by the project activity shall be assessed based on ex post surveys of users and the areas from which this woody biomass is sourced. The following potential source of leakage shall be considered: the use/diversion of non-renewable woody biomass saved under the project activity by non-project end-users that previously used renewable energy source. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass used by the non-project end-users that is attributable to the project activity, then B_y is adjusted to account for the quantified leakage increase in the use of non-renewable woody biomass used by the non-project end-users that is attributable to the project activity, then B_y is adjusted to account for the quantified leakage. B_y will be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. This is applied for the grouped project.

So $LE_y = BE_y \times (1-0.95)$.

Detail below:

PA	BE_y	LE_y
PA 1	10,275	514

PA 2	8,836	442
PA 3	9,175	459
PA 4	8,711	436
PA 5	10,975	549
PA 6	11,100	555
PA 7	4,670	234
PA 8	11,444	572
PA 9	6,495	325
PA 10	9,793	490
PA 11	16,269	813
PA 12	9,844	492
PA 13	9,315	466
PA 14	9,231	462
PA 15	9,788	489
PA 16	9,502	475
PA 17	9,163	458
PA 18	6,561	328
PA 19	9,197	460
PA 20	15,073	754
PA 21	7,433	372
PA 22	6,648	332
PA 23	9,409	470
PA 24	9,012	451
PA 25	7,995	400

PA 26	5,595	280
PA 27	8,619	431
PA 28	8,353	418
PA 29	12,349	617
PA 30	9,837	492
Total	280,667	14,036

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y : Emission reductions in year y (t CO₂e/yr)

BE_y : Baseline emissions in year y (t CO₂e/yr)

PE_y : Project emissions in year y (t CO₂e/yr)

LE_y : Leakage emissions in year y (t CO₂e/yr)

For detail emission reduction of each project activity below:

PA	BE _y	PE _y	LE _y	ER _y
PA 1	10,275	0	514	9,761
PA 2	8,836	0	442	8,394
PA 3	9,175	0	459	8,716
PA 4	8,711	0	436	8,275
PA 5	10,975	0	549	10,426
PA 6	11,100	0	555	10,545
PA 7	4,670	0	234	4,436
PA 8	11,444	0	572	10,872
PA 9	6,495	0	325	6,170
PA 10	9,793	0	490	9,303
PA 11	16,269	0	813	15,456

PA 12	9,844	0	492	9,352
PA 13	9,315	0	466	8,849
PA 14	9,231	0	462	8,769
PA 15	9,788	0	489	9,299
PA 16	9,502	0	475	9,027
PA 17	9,163	0	458	8,705
PA 18	6,561	0	328	6,233
PA 19	9,197	0	460	8,737
PA 20	15,073	0	754	14,319
PA 21	7,433	0	372	7,061
PA 22	6,648	0	332	6,316
PA 23	9,409	0	470	8,939
PA 24	9,012	0	451	8,561
PA 25	7,995	0	400	7,595
PA 26	5,595	0	280	5,315
PA 27	8,619	0	431	8,188
PA 28	8,353	0	418	7,935
PA 29	12,349	0	617	11,732
PA 30	9,837	0	492	9,345
Total	280,667	0	14,036	266,631

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU's (tCO ₂ e)	Removal VCU's (tCO ₂ e)	Total VCU's (tCO ₂ e)
01 Jul 2024 to 31 Dec 2024	280,667	0	14,036	266,631	0	266,631
Total	280,667	0	14,036	266,631	0	266,631

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01 Jul 2024 to 31 Dec 2024	301,907	266,631	-11.68%	

Total	301,907	266,631	-11.68%	- The distribution of WPs in PA1 is ongoing in this monitoring period. - The f_{nr} of PA1 decrease compared with registered PD - The operation of water purifier decrease in this monitoring period.
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APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

Section	Information	Justification
1.13	Not applicable	The project involves distribution WPs to individual households, there are no commercially sensitive information so this section is not applicable

APPENDIX 2: SUPPLY CHAIN

1. Public statement has been posted on SIPCO's website.

<https://intracocarbon.com/public-announcement-on-grouped-projects-for-water-purifiers-for-climate-and-community-action-project-id-2557>

