Gold Standard for the Global Goals

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT **- TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS 4593
Title of the project (s) covered by monitoring report	Municipal Waste Composting in Dschang, Cameroon
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	GS4593_PDD_CompostingDschang_V5_27 11 2018
Version number of the monitoring report	5
Completion date of the monitoring report	29/01/2026
Date of project design certification	18/02/2019
Date of Last Annual Report	N/A
Monitoring period number	06th
Duration of this monitoring period	(01/01/2024) to (31/12/2024) The first and the end dates are included in the monitoring
Project Representative	GoodPlanet Foundation
Host Country	Cameroon
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	CDM small-scale methodology: AMS.III-F: "Avoidance of methane emissions through composting", version 12
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label

	☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13: Climate Action (mandatory)	Emission reductions	2,451	VER's
SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.	Production of compost for agriculture	138.66	Tons
SDG 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all.	Creation of jobs	43	Number of people employed.
SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable.	Compost sold to local population.	171.62	Tons

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VER's
01/01/2024	31/12/2024	2,451

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The purpose of the project activity is to implement a composting unit to treat the organic fraction of the domestic wastes generated from the city of Dschang (in Cameroon). The project is the first domestic waste composting site in Cameroon and working on a commercial basis. The effects of the project on the improvement of the local life conditions and on the local economic development are strong and have been elaborated following the three dimensions (environmental, economic and social) of the sustainable development. By avoiding the organic wastes dumping on the SWDS (solid waste disposal site), the composting process in the project activity has avoided methane emissions.

The use of the compost to agricultural soils enhances the water retention capacity of the soils and also contributed to minimize soil erosions. It can be moreover pointed out that the chemical fertilizer consumption has been reduced thus improving the food quality and inhabitant's health. On a long-term basis, compost is cheaper than chemical fertilizer, leading to income savings for the local farmers and market gardeners. The project has created jobs, mainly for less educated and marginalized people (a part being women). The people employed on the composting site have preferentially been informal reintegrated into the system, given a job with a regular salary and hygienic and secured work conditions. The project thus contributes to a sustainable development of the city.

A.2. Location of project

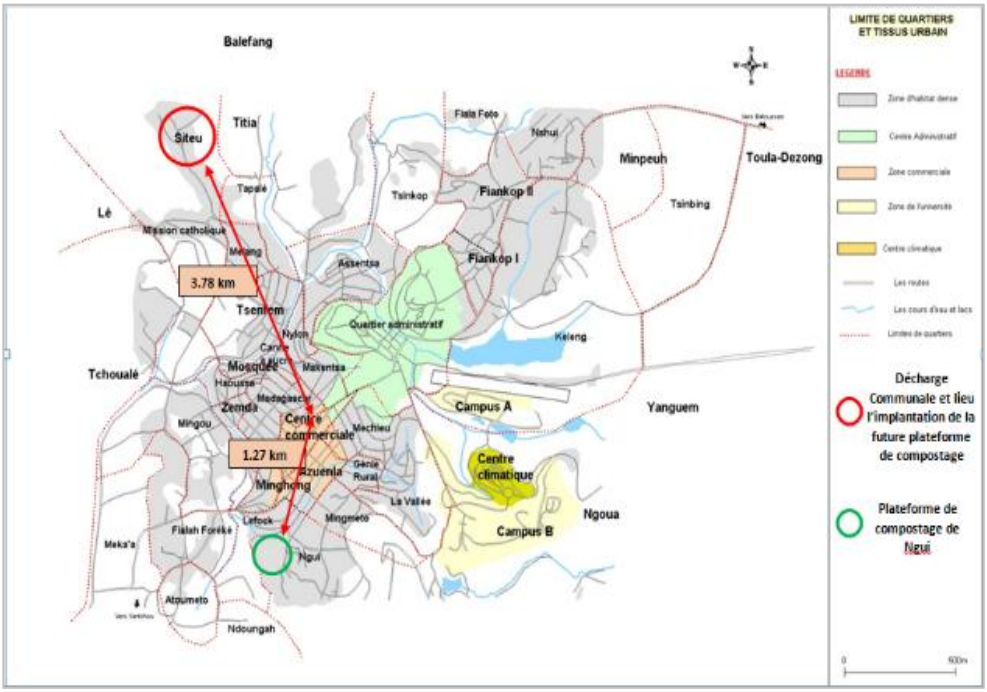
The project is implanted in Cameroon, Western Region, Department of Menoua, Province of Dschang

The project has two production sites: one located in Siteu district, the second in N'gui district. The two production sites are 5.05 km apart.

The composting unit coordinates are:

Siteu: X : 10°2'39.20"E Y : 5°25'43.57"N	N'gui: X : 10°3'17.62''E. Y : 5°26'0.73'' N.

The following maps shows the two production sites. The solid waste disposal site and Siteu's production are in the same location, 3.78km from the city center, when Ngui is 1.27km from the city center.



A.3. Reference of applied methodology

The project uses the following methodologies and guidelines:

• CDM small-scale methodology AMS.III-F: "Avoidance of methane emissions through composting", version 12.

• CDM tool: "Emissions from solid waste disposal site", version 08.00, (EB 94, Annex 7, May 4th, 2017),

• As well as the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation", version 03.0 (EB 96, Annex 5, September 22th 2017)

• And the CDM tool: "project and leakage emissions from composting" versions 02.0, (EB 96, Annex 6, September 22th 2017)

A.4. Crediting period of project

01/03/2017 to 28/02/2027 (10 years)

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

Prior to the launch of this project, the both sites have been installed in Dschang city to manage and recover the city waste. The composting of the city waste at Ngui site was initiated since the year 20/12/2014 and at the Siteu site in 11/04/2016. In 2017, the project has been validated as carbon project and the sale of VER's will be used to increase the capacity for treating and recovering city waste at the two sites.
The emission reductions are claimed for the monitoring period from the 01/01/2024 to the 31/12/2024. The total waste treated during the monitoring period is 4,901.96tons.

Process of collection and treatment of wastes:

The project team (ERA Cameroun) collects and treats the wastes at the composting sites. The trucks collect the solid waste in Dschang city and deliver it to Ngui and Siteu sites. Once each truck has been unloaded at the composting site, the heterogeneous waste is submitted to a first separation stage on ground where coarse non-compostable products are removed. Then the remaining waste is dumped on tables to be finely sorted (manual sorting) and producing two homogeneous parts:

- First is the organic fraction, which is further sent to the composting windrows and
- Second is the fine non-compostable products.

Non-compostable products are considered as a final refuse, to be disposed in the SWDS. For safety measures, each worker is provided with safety equipment, which are mandatory on the composting site.

Description of the installed technology (composting process):

The composting technology proposed in the project activity consists of a Biological Mechanical Treatment (BMT). A BMT system is a form of waste processing operation that combines a physical treatment (both manual and mechanical) and a biological treatment. In developed countries, BMT are increasingly used, due to regulations controlling the amount of organic matter allowed in landfills. In the proposed project, the biological treatment (composting) takes place during the fermentation in piles or windrows.
Composting consists in biodegradation of organic matter in aerobic conditions. The composting parameters like temperature and aeration are continuously controlled by the production team during the two stages of composting: fermentation and Maturation. The temperature is controlled daily by plunging a temperature sensor in composting windrows. Fermentation is a two months process during which the windrows are turned

6 times. Then, during the maturation phase, an organic stabilization occurs. Please refer to the reference documents "Windrow Turning in Ngui" and "Windrow Turning in Siteu", provided for verification the monitoring of windrow turning on the both sites. For the temperature monitoring, please refer to the documents "Temperature monitoring in Ngui" and "Temperature monitoring in Siteu".
The physical part of the process is largely carried out manually to save both on energy and investment costs and to provide regular jobs to informal workers on the dumpsite.

The composting process includes the following steps:

- Manual sorting to remove (or break) the coarse elements and inorganic waste components.
- Windrows preparation and control of bio-degradation conditions by manual turn-overs and
- Manual screening of the compost.

The photos of each process are provided below.

The project activity was started in the month December 2014 and the compost production was initiated on a large scale in 2015. The project was registered with the GS on 18th February 2019.
This is the sixth monitoring report for the project activity, and it represents the following crediting year: 01/01/2024 to 31/12/2024.

B.1.1 Forward Action Requests

No FAR were raised during the previous monitoring period.

B.2. Post-Design Certification changes

There were no post-design certification changes, therefore not applicable

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

There were no deviations in the project activity compared to the approved project documents, therefore not applicable

B.2.2. Corrections

Not applicable

B.2.3. Changes to start date of crediting period

The project registration was delayed due to the change in the project team, therefore the change in the first period of crediting from the 01/03/2017, instead of the expected date of 01/01/2015 (as mentioned in the registered PDD).

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

Not applicable

B.2.5. Changes to project design of approved project

Not applicable

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The project monitoring is carried out by the local project team present on the composting site. A separate monitoring system has been followed to correctly collect and record the required data of each of the four monitored parameters linked to the emission reduction calculations. The monitored parameters monitored are explained as below:

There are four monitored parameters linked to baseline emissions:

i) **Fraction of methane captured at the SWDS (f):** Visits are done regularly (at least once a year) to the final disposal site. And, the baseline scenario includes a levelling of waste, but no methane capturing.

Information to be reported for monitoring: ***value of "f"***

ii) **Global Warming Potential (GWP) of methane and nitrous oxide**: The Intergovernmental Panel on Climate Change (IPCC) periodically updates Global Warming Potential (GWP) values for converting all greenhouse gases (GHGs) to a CO2eq basis, based on the most recent science. Gold Standard requests to update GWP values following IPCC Fifth Assessment report (AR5)

Information to be reported for monitoring:

- GWPCH4 value (tonsCO2e/ton CH4),
- GWPN2O value (tonsCO2e/ton N2O)

iii) Total amount of organic waste prevented from disposal per year:

Since the loads of the waste delivery trucks vary not only with the season but also with the volume of waste to be transported, we have chosen a local adaptation based on the calculation of the carrying capacity of the wheelbarrows used at the composting site.

The total amount of organic waste (W_x), delivered to each of both composting installations (Siteu and Ngui), is the yearly sum of the organic fraction sent for composting.

The total amount of organic wastes is calculated on the basis of the wheelbarrow load (carrying capacity) of corresponding products multiplied by the number of

wheelbarrows. The average carrying capacity of the wheelbarrows is defined for each product twice per year (one for the dry season and one for the wet season) on the basis of a representative number (10) of measurements of the carrying capacity of the wheelbarrows. The carrying capacity of the wheelbarrows is determined thanks to the weighing machine available on the site, calibrated following the legal local regulation. To determine the average carrying capacity of the wheelbarrows please refer to document: "Monthly weighing of wheelbarrows",
To determine the number of wheelbarrows of waste treated please refer to the documents:

- "Nb of wheelbarrows of waste treated Ngui"
- "Nb of wheelbarrows of waste treated Siteu"

Such procedure allows a much better accuracy of the total amount of organic waste delivered to the composting installations (Siteu and Ngui).
Monthly weight of entrant household waste:
WCW = (Number of organic fraction wheelbarrows) x (average weight of organic fraction wheelbarrows) + (Number of non-compostable fraction wheelbarrows) x (average weight of non-compostable fraction)

Since January 2018, the difference is made between the rejections of the sorting on the ground and the rejections of the sorting on the table. Also, every month ten wheelbarrows full of organic matter, ten wheelbarrows full of rejections of the sorting on the ground and ten wheelbarrows full of rejections of the sorting on the table are weighed. The averages thus obtained are applied to the number of wheelbarrows of organic matter and to the number of wheelbarrows of both types of rejections obtained daily during the concerned month.

Considering the two sites, two seasons and different types of wastes/products, this average wheelbarrow weight was determined each month on each site.
The average weight of the wheelbarrows is determined each month on each site.

Monthly weight of entrant household waste:

- WCW = N° wheelbarrows full of organic matter in the month * + N° wheelbarrows full of rejections in the month

Please refer to the documents "Proof of compost production and inventory_ 2024", sheet "2024-Realized", line 27 and 47 for the amount of waste treated per month on the both sites.

iv) Weight fraction of the waste type j during the year y

The waste composition is monitored independently for each source of organic waste. Household waste includes all of six waste categories defined in the AMS III.F methodology. (table 2). For the complete characterization, please Refer to Section D2.

Waste source	Type j	Weight fraction
Household waste	Wood and wood products	3.0%
	Pulp, paper and cardboard	6.0%
	Textiles	5.6%
	Food, food waste, beverages and tobacco	69.2%
	Garden, yard and park waste	3.1%
	Glass, plastic, metal and other inert waste	13.1%

Table 2: Waste types for household waste during the monitoring period

According to the "methodological tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", the sample characterization was made by the production manager at least once a month.

The protocol used for characterization is as follows:
500 kg of waste are sampled from 5 different trucks on different days if not enough delivery occurs on the same day. The samples are collected in different spot of the truck for representativeness.
The whole sample is then divided in 4 parts, manually homogenized and put back together.
A Fourth of this sample is then selected by slicing the waste pile in 4. This part is the one which is characterized.
The pile of waste is screen to separate waste bigger than 100mm and smaller than 100 mm. Then the same operation is done to separate waste bigger than 20 mm and smaller than 20mm. Each pile is then sorted into each category of waste type.
The following table is then filled by weighing each category of waste:

	Total		Wood and wood products	Food and food waste	Paper	Textiles	Garden waste	Inerts	Fines < 20
>100mm									
20<X<100	Total	Total used for cara[3]							
<20									
Total (kg)									
Total (%)									

Table 3: Characterization table

The characterization results are recorded and the annual average has been calculated for the different waste source. The recorded data have been provided for verification. Please refer the excel documents – "Characterization campaign janv-dec 2024_ SITEU" and "Characterization campaign janv-dec 2024_ NGUI"

The obtained values weight fraction of the waste type for the present monitoring period has been provided below in the section D.2, page 20. An average of the values obtained for each month and for each composting platform was calculated and considered for the calculations. Also please refer the file "GS_4593_Confidential_VER_Cals_2024_V2 ", sheet "Year8.2024", cells T40 to T45 for the obtained values.
The local team is highly competent to realize these monitoring surveys. The site manager is an agronomist, and each procedure has been implemented under his guidance wherever required.

The project is registered with Gold Standard and no other voluntary standard, therefore no double counting of Emission reductions is possible.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	ϕ
Unit	NA
Description	Model correction factor to account for model uncertainties
Source of data	CDM "Methodological tool: Emissions from solid waste disposal sites" Version 08, page 13
Value(s) applied)	0.85
Choice of data or measurement methods and procedures	According to CDM tool used, as not enough data is available to calculate ϕ, the default value was chosen. The default value of 0.85 corresponds to current project conditions : application B (project activity avoids disposal of waste at the SWDS) and humid/wet conditions (cf. climatic data in Annex 7).
Purpose of data	Emission reduction calculations
Additional comments	

Data/parameter:	Ox
Unit	NA
Description	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering waste)
Source of data	CDM Methodological tool: Emissions from solid waste disposal sites" Version 08, page 14
Value(s) applied)	0.1
Choice of data or measurement methods and procedures	According to the CDM "Methodological tool: Emissions from solid waste disposal sites" Version 08
Purpose of data	Emission reduction calculations
Additional comments	As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	F
Unit	NA
Description	Fraction of methane in the SWDS gas (volume fraction)
Source of data	CDM Methodological tool: Emissions from solid waste disposal sites" Version 08, page 14
Value(s) applied)	0.5

Choice of data or measurement methods and procedures	According to the CDM "Methodological tool: Emissions from solid waste disposal sites" Version 08
Purpose of data	Emission reduction calculations
Additional comments	As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	DOCf
Unit	NA
Description	Fraction of degradable organic carbon (DOC) that can decompose
Source of data	CDM Methodological tool: Emissions from solid waste disposal sites" Version 08, page 14
Value(s) applied)	0.5
Choice of data or measurement methods and procedures	According to the CDM "Methodological tool: Emissions from solid waste disposal sites" Version 08
Purpose of data	Emission reduction calculations
Additional comments	This factor reflects the fact that some degradable organic carbon does not degrade, or degrades very slowly, under anaerobic conditions in the SWDS. A default value of 0.5 is recommended by IPCC As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	MCF
Unit	NA
Description	Methane correction factor
Source of data	CDM Methodological tool: Emissions from solid waste disposal sites" Version 08, page 15
Value(s) applied)	1
Choice of data or measurement methods and procedures	According to "Methodological tool: Emissions from solid waste disposal sites" Version 08". The water table is at least 11 meters deep2 and the SWDS is anaerobically managed: The placement of waste is managed (waste directed to specific deposit areas, a degree of control of scavenging and a degree of control of fires) and includes a leveling of waste and a mechanical compacting.
Purpose of data	Emission reduction calculations

Additional comments	The SWDS is both anaerobic and managed: waste is located to a specific place when it gets to the SWDS, a bulldozer levels the waste regularly, and guards are at the SWDS to make sure that no fire is voluntary started. See Annex 6 of the PDD. As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	DOCj
Unit	%
Description	Fraction of degradable organic carbon (by weight) in the waste type j
Source of data	CDM Methodological tool: Emissions from solid waste disposal sites" Version 08, page 16
Value(s) applied)	

Waste type j	DOCj (% wet waste)
Wood and wood products	43
Pulp, paper and cardboard (other than sludge)	40
Food, food waste beverages and tobacco (other than sludge)	15
Textiles	24
Garden, yard and park waste	20
Glass, plastic, metal and other inerts	0

Choice of data or measurement methods and procedures	According to CDM "According to "Methodological tool: Emissions from solid waste disposal sites" Version 08"
Purpose of data	Emission reduction calculations
Additional comments	Waste that cannot clearly be attributed to one of those categories are assimilated in a conservative way to the one having the most similar characteristics. For example, after visual analysis part):es smaller than 20 millimetres seems to be mostly organic matter thus they are assimilated to food waste. As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	kj
Unit	%
Description	Decay rate for the waste type j
Source of data	CDM Methodological tool: Emissions from solid waste disposal sites" Version 08, page 17

Value(s) applied)	<table><tr><td></td><td>Waste type j</td><td>Weather wet and tropical</td></tr><tr><td rowspan="2">Slowly degrading</td><td>Pulp, paper and cardboard (other than sludge), textiles</td><td>0.07</td></tr><tr><td>Wood and wood products and straw</td><td>0.035</td></tr><tr><td>Moderately</td><td>Other (non-food) organic putrescible garden and park waste</td><td>0.17</td></tr><tr><td>Rapidly degrading</td><td>Food, food waste, sewage sludge, beverages and tobacco</td><td>0.40</td></tr></table>
Choice of data or measurement methods and procedures	Climatic conditions in Dschang correspond to a tropical zone, with mean annual temperature >20°C and mean annual precipitation >1000mm.
Purpose of data	Emission reduction calculations
Additional comments	Cf Annex 7 in the PDD for climatic data. As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13 As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	Ef_{power}
Unit	tCO_2/MWh
Description	Emission factor for grid electricity
Source of data	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" EB 39 Annex 7 May 16th 2008
Value(s) applied)	1.3
Choice of data or measurement methods and procedures	The electricity used in the project comes from the grid, and the project consumes more energy (in the present situation due to lighting) than the baseline (scenario A, option A1 of the document sub-cited). Thus, the conservative default value of 1.3 MWh can be used.
Purpose of data	Emission reduction calculations
Additional comments	For the time being, the project works without electric power on both sites. The connection to the local grid is considered in the future; the electric consumption has then been monitored through the electricity meter and the periodic invoices of the distribution company As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	EF_{CH4},default
Unit	tCH_4/T

Description	Default emission factor of methane per ton of waste composted (wet basis)
Source of data	Methodological tool "Project and leakage emissions from composting". (Version 02.0.0)
Value(s) applied)	0.002
Choice of data or measurement methods and procedures	Default emission factor
Purpose of data	Emission reduction calculations
Additional comments	The emission factor was selected based on studying published results of emission measurements from composting facilities, literature reviews on the subject and published emission factors. Data from recent, high-quality sources was analysed and a value conservatively selected from the higher end of the range in results. As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13 As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	EF_{N2O},default
Unit	tN_2O/T
Description	Default emission factor of nitrous oxide per tonne of waste composted (wet basis)
Source of data	Methodological tool "Project and leakage emissions from composting". (Version 02.0.0). The emission factor was selected based on studying published results of emission measurements from composting facilities, literature reviews on the subject and published emission factors. Data from recent, high-quality sources was analyzed and a value conservatively selected from the higher end of the range in results.
Value(s) applied)	0.0002
Choice of data or measurement methods and procedures	
Purpose of data	Emission reduction calculations
Additional comments	As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

Data/parameter:	GWP_{CH4}
Unit	tCO_2e/tCH_4

Description	Global warming potential of CH_4
Source of data	IPCC AR5[1]
Value(s) applied)	28
Choice of data or measurement methods and procedures	
Purpose of data	Emission reduction calculations
Additional comments	

Data/parameter:	GWP_{N2O}
Unit	tCO_2e/tN_2O
Description	Global warming potential of N2O
Source of data	IPCC AR5[2]
Value(s) applied)	265
Choice of data or measurement methods and procedures	
Purpose of data	Emission reduction calculations
Additional comments	As per the GS, no requirement for an indicator for the parameters linked to the goal SDG 13

D.2 Data and parameters monitored

Data/parameter:	SDG 13 - fy
Unit	NA
Description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y.

[1] https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values.pdf
[2] https://globalgoals.goldstandard.org/standards/RU-2020-PR-V1.2-GWP-values.pdf

Source of data	Historical data on the amount captured on the SWDS by the municipality or the entity managing the SWDS
Value(s) applied)	0
Measurement methods and procedures	
Monitoring frequency	Once a year
QA/QC procedures:	
Purpose of data	
Additional comments	There is no capture / combustion of gas at the solid waste disposal site at the time of writing the Monitoring report and the municipality doesn't has it as a project.

Data/parameter:	SDG 13 - Wx
Unit	Tons
Description	Total amount of organic waste prevented from disposal in year
Source of data	Measurements by ERA (local team)
Value(s) applied)	• Ngui : 3,460.87 • Siteu : 1,441.1 • Total : 4,901.96
Measurement methods and procedures	As per to the methodological tool "project and leakage emissions from composting", there are two options to determine the quantity of waste composted in year y allows two different methods to calculate the amount of composted waste. Option 1: Procedure using a weighing device Monitor the weight of waste delivered to the composting installation using an on-site weighbridge or any other applicable and calibrated weighing device (e.g. belt-scales). Option 2: Procedure without using a weighing device This procedure shall only be applied in the case that there is no weighbridge or any other applicable and calibrated weighing device available on site. Under this procedure, Qy is calculated based on the carrying capacity of each truck delivering waste to the composting installation in year y For this project, option 2 has been adopted. A local adaptation based on the calculation of the carrying capacity of the wheelbarrows used at the composting site is used. The total amount of organic wastes is calculated on the basis of the wheelbarrows load (carrying capacity) of corresponding products multiplied by the number of wheelbarrows. For each site, a scale is used for determining the carrying capacity of wheelbarrows. The scales are verified by local

	Cameroun's Ministry of Trade per year. Please refer to the document "Justification of weighing machines calibration 2024" and "Justification of weighing machines calibration 2023" for this verification.
Monitoring frequency	10 times per month
QA/QC procedures:	Every month ten wheelbarrows full of organic matter, ten wheelbarrows full of rejections of the sorting on the ground and ten wheelbarrows full of rejections of the sorting on the table are weighed. The carrying capacity of the wheelbarrows is determined with the help of the weighing machine available on the site, calibrated following the legal local regulation. The scales are verified by the local authority one time per year. The calibration validity is for one year and conducted on august-September of the year. The calibration made in 2023 covers the period 2023/2024 and in 2024 covers the period 2024/2025. For Ngui site, the scale designation is "Balance Mécanique Portée Max 500kg ». The calibration validity is from 09/08/2023 to 08/08/2024 and 24/09/2024 to 23/09/2025. Please refer to the document "Justification of weighing machines calibration 2023" page 1 and "Justification of weighing machines calibration 2024, page 1. There are 46 uncovered days in 2024 due to the closure for the annual holidays of the local administration. During this gap period, the site recorded the treatment of 555.68 tonnes of wasteFor Siteu site, the scale designation is "Balance Mécanique Portée Max 500kg ». The calibration validity is from 30/08/2023 to 29/08/2024 and 24/09/2024 to 23/09/2025. Please refer to the document "Justification of weighing machines calibration 2023" page 2 and "Justification of weighing machines calibration 2024, page 2. There are 24 uncovered days in 2024 due to the closure for the annual holidays of the local administration. During this gap period, the site recorded the treatment of 133.1. tonnes of waste. These quantities were included in the calculation of the ER. However, as a conservative approach and to account for the uncertainty resulting from the invalid calibration of the weighing scales, a 10% deduction of these quantities will be applied in the ER calculation. Please refer to the document "GS 4593 Confidential VER Cals 2024_V2", sheet "Year8.2024", cells L10, L11, M10 and M11. CALIBRATION PROCEDURE Calibration takes place on the composting sites.

	Some preliminary tests are carried out using loads approaching the operating limits of each balance to ensure that it is working correctly. If the weighing instrument proves to be non-compliant and requires adjustment, a calibration is carried out before and after the adjustment. Eccentricity test In this test, the reference load is placed at various predetermined points on the weighing cell. Firstly, the load (technically the load's centre of gravity) is placed in the centre of the load cell before the reading is taken. The load is then placed at four other points in the load cell. The zero is checked between each measurement to ensure that it has not changed. Repeatability test The repeatability test consists of placing the same load several times in succession in exactly the same place in the weighing cell (to avoid any error due to eccentricity) and taking the measurement each time. The conditions under which the test is carried out must be identical and constant, including the way the weight is handled. Weighing test Start by zeroing the instrument without any load on it. Place the test load at the first test point, wait for stabilisation and read the indication. Continue to increase the test load point by point. Once the maximum load has been reached, reverse the procedure, decreasing the test load for the following points. Between 5 and 10 different test loads are used.
Purpose of data	Emission reduction calculations
Additional comments	

Data/parameter:	SDG 13 - Pn,j,x
Unit	%
Description	Weight fraction of the waste type j in the sample n collected during the year x

Source of data	Characterization of raw waste made by ERA Cameroun in 2024 for ex-ante calculation. The figure used for emission reduction calculations are the mean of 12 different characterizations done from (01/01/2024) to (31/12/2024).
Value(s) applied)	<table><tr><td>Wood and wood products</td><td>3.0%</td></tr><tr><td>Pulp, paper and cardboard</td><td>6.0%</td></tr><tr><td>Textiles</td><td>5.6%</td></tr><tr><td>Food, food waste, beverages and tobacco</td><td>69.2%</td></tr><tr><td>Garden, yard and park waste</td><td>3.1%</td></tr><tr><td>Glass, plastic, metal and other inert waste</td><td>13.1%</td></tr></table> Please refer to ER calculation excel "GS_4593_Confidential_VER_Cals_2024_V2", sheet "Year8.2024, cells T40 to T45
Measurement methods and procedures	A characterization is done every month by ERA Cameroun according to the characterization protocol on incoming waste (composed of six types of waste described by the methodology). Please refer to the excel files "Characterization campaign janv-dec 2024_ SITEU" and "Characterization campaign janv-dec 2024_ NGUI".
Monitoring frequency	Monthly
QA/QC procedures:	Such measurement method is based on the NF X30-408 and NF XP X30-466 standards.
Purpose of data	Emission reduction calculations
Additional comments	Characterization have been done every month to ensure reliable information on the nature of the waste collected. The sampling plan is described in the section D.4 of this report.

Data/parameter:	SDG 13 - Eey
Unit	Kwh
Description	Electrical energy consumption for compost production in year y.
Source of data	Electricity bills.
Value(s) applied)	457

Measurement methods and procedures	Take the value of energy consumption from the electricity bill.
Monitoring frequency	Monthly
QA/QC procedures:	
Purpose of data	Emission reduction calculations
Additional comments	Please refer to the document "Electricity bills 2024" for some scanned copies of the Electricity bills For the total energy consumption, Please refer to the ER calculation excel sheet "Year8. 2024" – Cell D50

Data/parameter:	SDG 2: Proportion of agricultural area under productive and sustainable agriculture / Qy,treatment
Unit	Tons of compost
Description	Quantity of compost produced in year y
Source of data	ERA's recording
Value(s) applied)	138.66
Measurement methods and procedures	Total quantity of the compost bags weighed and packed in sacks, are recorded by the team on the platform. The compost records are cross-checked by the project manager of the composting site.
Monitoring frequency	Continuous
QA/QC procedures:	The platform team records the quantity of bagged compost in the registration file. The data is verified by the site manager, who then records the data in the digital file.
Purpose of data	Estimating net benefits for the SDG 2.
Additional comments	Considering the project budget and the high cost to monitor the "proportion of agriculture area under production and sustainable agriculture", the project activity has provided the total amount of compost produced per year, which is sold to local farmers for agriculture use, ensuring a sustainable and resilient agricultural practice. Please refer to the ER calculation excel sheet – "GS_4593_Confidential_VER_Cals_2024_V2": Sheet Year8.2024 – Cell D47

Data/parameter :	SDG 8: Proportion of informal employment in non-agriculture employment, by sex / Number of workers
Unit	Number
Description	Total number of workers employed due at the composting site of the project activity
Source of data	Salary transfer order
Value(s) applied)	43
Measurement methods and procedures	The number of workers present and absent during the days worked on the both sites is recorded in the ERA database. Please refer to the document "Proof of compost production and inventory_ 2024", sheet "2024-Realized" cell P70, for the average number of workers on the two sites in 2024
Monitoring frequency	Monthly
QA/QC procedures:	After each working day, the workers sign the attendance sheet to determine the number of days worked for each worker.
Purpose of data	Monitoring the SDG 8 - Promote inclusive and sustainable economic growth, employment and decent work for all
Additional comments	The salary conditions are in line with Cameroon government policies. To date, the workers 'salaries are higher than the minimum salary set by government'. The employment details are publicly available. To recruit workers on the sites, the commune issues a written announcement posted in the commune office. Candidates are selected on the basis of their skills and motivation. If there are no applicants, the commune asks workers already on site if they know of anyone interested in the position. The trial period is one week on site. Few scan copies of the salary transfer order are provided for verification, please refer to the document: "Salary January 2024", "Salary June 2024", "Salary December 2024",

Data/parameter:	SDG 11: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities / i) Total amount of organic waste treated into compost ii) Compost sold and application for agriculture iii) Air and water quality near the surrounding areas of the waste composting facilities
Unit	i) tons of organic waste treated in year ii) number of clients monitored by the commercial team iii) number of complaints about air and/or water quality

Description	This parameter is to ensure application of compost to organic soil and assure no foul odors or water pollution in the surrounding areas of the activity.
Source of data	ERA's recording ERA's commercial visits record. Complaint books
Value(s) applied)	i) 4,901.96 tons of organic waste were treated in 2024 ii) 171.62 tons of compost were sold in 2024 iii) 0 complaint about air and/or water quality
Measurement methods and procedures	Compost sold: The compost sold is recorded by the salesteam after each sale or delivery Compost application for agriculture: The plot visit is done by an agronomist working with the project. The visit is planned with the client according to his availability. The number of clients visited is recorded in the data recording Air quality: Checking the number of complaints on air quality in the complaint book
Monitoring frequency	Continuous As a minimum, the Sales visits are done twice a year to the main clients.
QA/QC procedures:	In order to follow the buyers of the compost, a sales and delivery records are maintained as a part of the monitoring plan. Compost application for agriculture: A Sheet of good practices on the use of compost (written in French) are available to compost users. This sheet of good practices on the use of compost are distributed to the end-users during the compost purchase or the delivery. Please refer to the document "Compost Sheet of good practice" for this sheet of good practice. Plot visits are made to the some clients for ensuring the good use of the compost in agriculture. Please refer to the document "ERA's commercial visits 2024" for the plot visits in 2024. Air quality: Complaint registers are maintained at the sites to record complaints from neighbors. In 2024, there were no complaints of offensive odors from neighboring residents. Please refer to the file "Complaint register"
Purpose of data	Monitoring the SDG 11 - Make cities inclusive, safe, resilient and sustainable

Additional comments	The aerobic conditions in soil application are verified during the field visits. This visit is carried out by an agronomist from the project. During the visit, the instructions for using the compost are checked. This visit is also a way of checking whether the compost is being used on flooded crops, as well as user satisfaction During the monitoring period, no complaints have been received.

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
SDG 13 - fy	0	0
SDG 13 - Wx	4,901.96	4,935
SDG 13 - Pn,j,x	Type j: Weight fraction Wood and wood products: 3,0% Pulp, paper and cardboard: 6,0% Textiles: 5,6% Food, food waste, beverages and tobacco: 69,2% Garden, yard and park waste: 3,1% Glass, plastic, metal and other inert waste: 13,1%	Weight fraction 2.5% 6.9% 6.4% 66.2% 3.5% 14.5%
SDG 13 - EEy	457 kWh	589 kWh

SDG 2 : Proportion of agricultural area under productive and sustainable agriculture / $Q_{y,treatment}$	171,62 t	153.29 t
SDG 8 : Proportion of informal employment in non-agriculture employment, by sex / Number of workers	43	48
SDG 11 : Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities / i) Total amount of organic waste treated into compost	4,257 t	4,221 t
SDG 11 : Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities / ii) Compost analysis and its application for agriculture	Not reported	Not reported
SDG 11 : Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities / iii) Air and water quality near the surrounding areas of the waste composting facilities	0 complaint	0 complaint

D.4. Implementation of sampling plan

Characterization sampling plan:

The protocol used for characterization is based on the NF X30-408 and NF XP X30-466 standards and is as follows:
The aim of this sampling is to get a good representation of the waste collected, and of incoming waste on the platform. To insure a representative sampling, waste is gathered from different collection points, trucks and tricycle. in order to represent at best incoming waste.
The city of Dschang has three waste collection points. The waste samples used for the characterization were collected from all of these collection points. Upon arrival at the sites, waste transported by the different trucks and tricycles is consolidated in a single area.
At the Siteu site, waste collection is carried out using two trucks. The waste samples used for characterization at this site are taken from the loads of both trucks.
At the Ngui site, waste collection is performed using tricycles due to the poor condition of the access roads leading to the site. To ensure waste collection at Ngui, the project operates eight (08) tricycles, and waste samples for characterization are collected from all eight tricycles.500 kg of waste are sampled from different trucks and other type of equipment waste collectors (tricycles) on different days if not enough deliveries occur on the same day. The samples are collected in different spot of the truck for representativeness.
The whole sample is then divided in 4 parts, manually homogenized and put back together.
A Fourth of this sample is then selected by slicing the waste pile in four. This part is the one, which is characterized.
The pile of waste is screen to separate waste bigger than 100mm and smaller than 100 mm. Then the same operation is done to separate waste bigger than 20 mm and smaller than 20mm. Each pile is then sorted into each category of waste type.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG 2: Zero Hunger

Without the composting project, there would have been no production of compost. Therefore, the baseline value for this indicator is zero tons of compost.

SDG 8: Decent Work and Economic Growth

Without the composting project, there would have been no creation of employment for the local communities. Therefore, the baseline value for this indicator is zero employment at the composting site.

SDG 11: Sustainable Cities and Communities

Without this composting project, there would have been no sales of compost to local farmers. Hence no support of local sustainable practices. Therefore, the baseline value for this indicator is zero tons of compost.

SDG 13: Calculation of Baseline GHG emissions

As explained in the paragraph B.6.3 of the PDD, the GHG sources, sinks and reservoirs for the baseline are the methane emissions avoided from preventing waste disposal at the solid waste disposal site. These emissions are calculated as follow:

$$BE_{CH_4,SWDS,x} = \varphi.(1-f).GWP_{CH_4}.(1-OX).\frac{16}{12}.F.DOC_f.MCF.\sum_{x}^{Z}\sum_{j}W_{j,y}.DOC_j.e^{-k_j.(Z-x)}.(1-e^{-k_j})$$

Where:

BECH4,SWDS,y	Methane emissions avoided during the year y from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year y in (tCO2e)	Calculated
ϕ	Model correction factor to account for model uncertainties	ϕ = 0.85
F	Fraction of methane captured at the SWDS and flared, combusted or used in another manner	f = 0 Monitored
GWPCH4	Global warming potential (GWP) of methane, valid for the relevant commitment period	GWPCH4 = 28 Monitored
F	Fraction of methane in the SWDS gas (volume fraction)	F = 0.5
DOCf	Fraction of degradable organic carbon (DOC) that can decompose	DOCf = 0.5
MCF	Methane correction factor	MCF = 1

<table>
<tr><td>Wj,k</td><td>Amount of organic waste type j prevented from disposal in the SWDS in the year x (tons).</td><td>Calculated from two Monitored parameters: Total amount of organic waste prevented from disposal and Weight fraction of the waste type j</td></tr>
<tr><td>DOCj</td><td>Fraction of degradable organic carbon (by weight) in the waste type j</td><td><table><tr><td>Waste type j</td><td>DOCj (% wet waste)</td></tr><tr><td>Wood and wood products</td><td>43</td></tr><tr><td>Pulp, paper and cardboard (other than sludge)</td><td>40</td></tr><tr><td>Food, food waste beverages and tobacco (other than sludge)</td><td>15</td></tr><tr><td>Textiles</td><td>24</td></tr><tr><td>Garden, yard and park waste</td><td>20</td></tr><tr><td>Glass, plastic, metal and other inerts</td><td>0</td></tr></table></td></tr>
<tr><td>Kj</td><td>Decay rate for the waste type j</td><td>Wood 0.035
Pulp, paper 0.07
Textile 0.07
Food waste 0.40
Garden waste 0.17
Inert waste 0</td></tr>
<tr><td>j</td><td>Waste type category</td><td>Household waste</td></tr>
<tr><td>X</td><td>Year for which methane emissions are calculated</td><td>runs from the first year of the crediting period (x=1) to year z, with z=10</td></tr>
<tr><td>Z</td><td>Final year considered for methane emissions calculation.</td><td>Following suggestion by the GS TAC, Z =10 is used.</td></tr>
</table>

The factor "ϕ*(1-f)*GWP_{CH4}*16/12*F*DOC_f*MCF", which could be considered as a constant K, independent from the year and from the waste type is equal to:

K = 0.85*28*(1-0) * 16/12 * 0.5 *0.5 *1 = 7.14

The formula becomes then:

$$BE_{CH4,SWDS,y} = 6{,}936 * \sum_{x}^{z} \sum_{j} W_{j,y}.DOC_j.e^{-k_j(z-x)}.(1-e^{-k_j})$$

Calculation (01/01/2024) to (31/12/2024) :

$BE_{CH4,SWDS,2024}$ = 2,915 tC02

E.2. Calculation of project value or estimation of project situation of each SDG Impact

SDG 2 : Zero Hunger

This project produced 138.66 t of compost in 2024, helping to produce food locally.

SDG 8: Decent Work and Economic Growth

This project created 43 jobs in 2024.

SDG 11: Sustainable Cities and Communities

Thanks to this project, 171.62 t of compost have been sold in 2024. This compost sold locally allows to sustain local durable farming practices.
This compost is used by local communities as a soil amendment. It allows them to feed crops and build soil fertility.

One of the examples of the Farmers training on the Compost application

Growing cultures thanks to Compost used as soil amendment.

SDG 13: Calculation of GHG emissions and/or removals for the project

As explained in the paragraph B.6.3 of the PDD, the project GHG emissions are:
i) CO2 emissions on account of electricity used by the project activity facilities for screening and mechanical sorting of compost.
ii) Methane emissions during composting process
iii) Nitrous oxide emissions during composting process

These emissions are calculated as follow:

$$PE_{comp,y} = PE_{EC,y} + PE_{CH4,y} + PE_{N2O,y}$$

Where:
$PE_{comp,y}$= Project activity emissions in the year "y" (tonnes of CO2 equivalent)
$PE_{EC,y}$ = Emissions from electricity consumption in the year "y",
$PE_{CH4,y}$ = Methane emissions during composting process during year "y"
$PE_{N2O,y}$ = Nitrous oxide emissions during composting process during year "y"

Emissions from electricity consumption

$$PE_{y,power} = EEy * EF_{CO2} * (1+ TDL)$$

Where:

EEy	Electrical energy consumption in the year y (MWh)	Monitored
EFCO2	CO2 emission factor from electricity produced from the grid	EF CO2 = 1.3 kg CO2e/MWh
TDL	Average technical transmission and distribution losses for providing electricity to source j in year y	0.2

Calculation (01/01/2024) to (31/12/2024):

- **$PE_{y,pow}$**= (1+0.2) * 0. 457 * 1.3 = 0.71 tC02

Methane emissions during composting process

$$PE_{y,comp} = Qy * EF_{composting} * GWP_{CH4}$$

Where:

Qy	Quantity of raw waste treated in the year y (tonnes)	Monitored
EFcomposting	Emission factor for composting of organic waste (t CH4/ton waste treated).	EFcomposting= 0.002t CH4/t waste treated on a wet basis.
GWPCH4	Global warming potential (GWP) of methane, valid for the relevant commitment period	GWP_{CH4} = 28

Calculation (01/01/2024) to (31/12/2024):

- **$PE_{y,comp}$**= 4,257 *0.002*28=245.72 tC02

Nitrous oxide emissions during composting process

Nitrous Oxide emissions are calculated following the default values of the tool to determine "project and leakage emission from composting" versions 01.0.0, as the monitoring method is too expensive for a project this size.

$$PE_{N2O,y} = Qy * EF_{N2O,y} * GWP_{N2O}$$

Where:

Qy	Quantity of waste composted in year y (t/yr)	Monitored
EFN2O,y	Emission factor of methane per tonne of waste composted valid for year y (t N2O / t)	EFN2O,y= 0.0002 t N2O /t
GWPN2O	Global warming potential of N2O (TCO2e/t N2O)	GWP_{N2O}= 265

Calculation : (01/01/2024) to (31/12/2024):

- **$PE_{y,N20}$**= 4,257 * 0.0002 * 25=232.56 tC02

The value of SDG 13:

PEcomp,y= PEEC,y + PECH4,y + PEN2O,y = 0.71 + 245.72 + 232.56 = 465 t CO2.

E.3. Calculation of leakage

There is no leakage in this project as the compost is applied to soil correctly.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emission reductions (unit: tons of CO2eq)	2,915	465	2,451
2	Proportion of agricultural area under productive and sustainable agriculture (unit: tons of compost produced)	0	138.66t	138.66t
8	Proportion of informal employment in non-agriculture employment, by sex / Creation of jobs (Unit: Number of jobs created)	0	43	43
11	Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities / Compost application (unit: tons of compost)	0	171.62t	171.62t

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[3] achieved during this monitoring period
13 (Emission reduction)	4,485 tCO2eq	2,451 tCO2eq
2 (Compost produced)	1,800 tons	138.66 tons
8 (jobs created)	54 beneficiaries	43 beneficiaries
11 (compost sold)	520 tons	171.62 tons

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

The quantities of VER (SDG 13) have not been achieved as estimated. The VER estimation was originally based on the PDD considering larger quantities of waste to be treated. This explains the lower volume of VER than the estimated value in the PDD.
The number of beneficiaries (employed people) is bigger than expected because the estimation about the number of employees needed was done with a very conservative value.
For the compost production (SDG 2), the PDD estimated that production would be 1,800 tonnes in 2024 .This goal has not been achieved as the amount of waste treated is lower than the PDD estimates.

[3] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

For the SDG 8, the value estimated in the PDD is higher than the value obtained in this present monitoring report because the quantity of waste treated was estimated to be greater requiring more employees
For SDG 11, the amount of compost sold was lower as the compost production target was not met.

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

There are no increasing in achieved SDG Impacts from estimated value in approved PDD.

SECTION F. SAFEGUARDS REPORTING

Not applicable

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

During the monitoring period, no grievance have been received.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

>> None

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

The PD has provided a formal declaration that no legal contest has arisen with the project during the monitoring period

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption