Project
RoU Verification
Report

2022

COVER PAGE RoU Project Verification Report Form (VR)	
BASIC INFORMATION	
Name of approved UWR Project Verifier / Reference No.	Enviance Services Private Limited
Type of Accreditation	☒ RoU Accreditation UWR ☐ Water Audit/Water Footprint Expertise
Approved UWR RoU Scopes for Project Verification	RoU Scope 2: Measures for conservation and storage of unutilized water for future requirements including freshwater ecosystems and wetlands.
Validity of UWR approval of Verifier	30/09/2027
Completion date of this VR	31/07/2025
Title of the project activity	Rainwater Harvesting Project by ACAATINGA
Project reference no. (as provided by UWR RoU Program under Approved for Verification tab)	UWR ID: 491
Name of Entity requesting verification service (can be Project Owners themselves or any Entity having authorization of Project Owners, example aggregator.)	Kosher Climate India Private Limited
Contact details of the representative of the Entity, requesting verification service (Focal Point assigned for all communications)	Name: Narendra Kumar Email ID – narendra@kosherclimate.com
Country where project is located	Brazil
Applied reference documents used for estimation (approved water data and reference guides under the UWR Rou Standard used)	Instituto Nacional de Meteorologia - INMET (Brazil) https://portal.inmet.gov.br/
Project Verification Criteria: Mandatory requirements to be assessed	☒ UWR Standard ☒ Applicable Approved Calculations ☒ Applicable Legal requirements /rules of host

	country ☒ Eligibility of the Project Type ☒ Start date of the Project activity ☒ Meet applicability conditions in the applied methodology ☒ Credible Water Data Sets ☒ Do No Harm Test ☒ RoU calculations ☒ PCNMR ☒ No Double Counting ☐ Others (please mention below)
Project Verification Criteria: Optional requirements to be assessed	☒ Environmental Safeguards Standard and do-no-harm criteria ☒ Social Safeguards Standard do-no-harm criteria
Project Verifier's Confirmation: The *UWR Project Verifier* has verified the UWR project activity and therefore confirms the following:	The UWR RoU Project Verifier [*Enviance Services Private Limited*], certifies the following with respect to the UWR Project Activity [*Rainwater Harvesting Project by ACAATINGA*]. ☒ The Project Owner has correctly described the Project Activity in the PCNMR version 2.0 (dated *22/07/2025*) including the applicability of the guidance documents and water data as outlined in the UWR RoU Standard [*RoU Scope 2: Measures for conservation and storage of unutilized water for future requirements including freshwater ecosystems and wetlands*.] and meets the applicability conditions and has achieved the estimated RoUs, complies with the monitoring methodology and has calculated RoU estimates correctly and conservatively. ☒ The Project Activity is likely to generate 19,056 RoUs as indicated in the PCNMR version 2.0, which are applicable with UWR rules ☒ The Project Activity is not likely to cause any net-harm to the

	environment and/or society ☒ The Project Activity complies with all the applicable UWR rules[1] and therefore recommends UWR Program to register the Project activity with RoUs.
Project Verification Report, reference number and date of approval	Verification Report UWR Project ID: 491 Date: 31-07-2025
Name of the authorised personnel of UWR Project Verifier and his/her signature with date	 Vidhya MuraliKrishna Quality Manager Date: 31-07-2025

[1] https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UWRtermsandconditionsVer7_290525201833453236.pdf

PROJECT VERIFICATION REPORT

Executive summary

The project activity is titled – “Rainwater Harvesting Project by ACAATINGA”. The project is located in District Crateús and Buriti dos Montes municipality, State Ceará and Piauí, Brazil.

Acaatinga is the Implementor of the Rainwater Harvesting (RWH) project, responsible for providing the necessary materials and constructing of cisterns. The local communities of Crateús and Buriti dos Montes are the End Users and are responsible for maintaining the systems that capture rainwater during the monsoon season. An agreement has been signed between Acaatinga and the local communities (End Users) stating that any environmental benefits, such as the Rainwater Offset units (RoU) associated with the project, will be retained by Acaatinga.

The project activity is focused on water management for human consumption, enabling them to effectively manage the harvested rainwater and ensure its safe use for drinking and other essential needs.

The project activity involves the installation of Rainwater Harvesting (RWH) cisterns constructed near the homes of local community members. The Project Proponent, Acaatinga, adheres to all required rules and regulations by the Brazilian ministry of Development and Social assistance, Family and fight against Hunger[2]. Each household is allotted its own distinct cistern, ensuring that the water user rights remain with the local communities.

The installed Rainwater Harvesting System is man-made constructed cisterns that conserve and stores rainwater for future use in the rural area of the Crateús and Buriti dos Montes municipality.

Rainwater harvesting (RWH) is the process of collecting, conveying, and storing rainfall for future use. It involves capturing rainwater from rooftops (roof water) which can then be reused for irrigation or other domestic purposes. The collected rainwater is directed into storage facilities, which can vary in size small for residential use and large for commercial and institutional applications.

The Project aims to improve living conditions for low-income families in rural areas by installing 16,000-liter plate cisterns for rainwater collection and storage. Alongside this infrastructure, capacity-building and training in water management are provided. By maintaining these systems, families can access quality water more easily, reducing the need for long walks to find water and avoiding reliance on low-quality sources. Ultimately, these efforts not only enhance water access for human consumption but also contribute to food and nutritional security, fostering resilience in Brazil's semi-arid regions.

[2] https://www.gov.br/mds/pt-br/acoes-e-programas/acesso-a-alimentos-e-a-agua/programa-cisternas

Both the municipalities area faces acute shortage of water due to frequent failure of monsoon creating drought like situation. The overall annual average rainfall for Cratéus is 559.4 mm and for Buriti dos Montes is 619.3 mm.

The annual rainfall data for the study area is summarized in the tables below. For **Crateús**, the highest recorded rainfall was 1,080.4 mm in 2020, while the lowest was 137.6 mm in 2019. The 15-year average annual rainfall for Crateús is 559.4 mm. In **Buriti dos Montes**, the maximum rainfall recorded was 1,111.4 mm in 2023, and the minimum was 124 mm in 2017. The 14-year average annual rainfall for Buriti dos Montes is 619.3 mm. The overall Annual average rainfall for the entire project area is 589.35 mm.

Year wise Annual Rainfall for the last 15 years (2009 to 2023) in the city of Crateús, Ceará - Brazil[3]	
Year	**Observed rainfall (mm)**
2009	904.4
2010	350.0
2011	941.8
2012	244.0
2013	402.2
2014	276.6
2015	600.0
2016	595.2
2017	444.8
2018	897.4
2019	137.6
2020	1080.4
2021	596.8
2022	275.0
2023	644.8

Table: Annual Rainfall for last 21 years for Cratéus

Year wise Annual Rainfall for the last 14 years (2010 to 2023) in the city of Castelo do Piauí, Piauí - Brazil[4]	
Year	**Observed rainfall (mm)**
2010	903.8
2011	1109.2
2012	308.6
2013	434.0
2014	619.8
2015	501.6
2016	346.2
2017	124.0

[3] Instituto Nacional de Meteorologia - INMET
[4] https://portal.inmet.gov.br/

2018	1030.0
2019	323.4
2020	no data
2021	no data
2022	no data
2023	1111.4

Table: Annual Rainfall for last 21 years for Buriti dos Montes

The project activity qualifies under the UWR RoU program since the PP has undertaken water conservation measures to collect rainwater efficiently. The Rainwater Offset Units or Water Credits (RoU) were calculated based on UWR Protocols and Brazilian weather and rain data.

The current monitoring period is from 01/01/2014 to 31/12/2023 and the RoU's generated by the project activity in this monitoring period are 19,056 RoU's.

Scope of Verification

The scope of the services for the project is to perform Project Verification of concerned Project Activity. The scope of verification is to assess the claims and assumptions made in the Project Concept Note & Monitoring Report (PCNMR) against the UWR criteria, including but not limited to, UWR program verification guidance document, UWR Standard, UWR Program Manual, and related rules and guidelines established under Program process.

Verification Process and Methodology

The verification process was undertaken by a competent verification team and involved the following,

- Desk review of documents and evidence submitted in context of the reference rules and guidelines issued by UWR,
- Undertaking/conducting site visit/remote audit, interview or interactions with the representative of the project owners/representatives,
- Reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and preparing a draft verification opinion based on the auditing findings and conclusions
- Finalization of the verification opinion (this report)

Desk/Document review

A detailed desk review of the PCNMR, Methodology and all other associated documentation and references took place in advance of the remote site visit, and additional documents that were not available for the desk review were requested for review during the remote site visit. Additional information can be required to complete the verification, which may be obtained from other public and reliable sources or through telephone and face to face interviews with key

stakeholders (including the project developers and where necessary, government and NGO representatives in the host country).
A list of all documents reviewed or referred to in the course of this verification is included below in Appendix 3.

Follow up interviews/site visit

The verifier conducted remote audit and had requested for site photographs, short videos. A remote interview was conducted with the project owners and stakeholders.

Conclusion
Based on the work performed, the verifier concludes that in the project "Rainwater Harvesting Project by ACAATINGA", the information and data presented in the PCNMR version 2.0 dated 22/07/2025 meets all relevant requirements of the UWR for UWR project activities.
For the current monitoring period, verified RoU's achieved by the project activity were as below;

Start date of monitoring period	01/01/2014
End date of monitoring period	31/12/2023
RoU's achieved	19,056 RoU's

Project Verification team, technical reviewer and approver

Project Verification team

No.	Role	Last name	First name	Affiliation (e.g. name of central or other office of UWR Project Verifier or outsourced entity)	Involvement in		
					Document review	Off-Site inspection	Interviews
1.	Team Leader/ Technical Expert	Singh	Ritu	Enviance Services Private Limited	Yes	Yes	Yes
2.	Validator-Verifier/ Technical Expert in Trainee	Mahajan	Swati	Enviance Services Private Limited	Yes	Yes	Yes
3.	Validator-Verifier in trainee/ Technical Expert in Trainee	Shastri	Prakhar	Enviance Services Private Limited	Yes	Yes	Yes

Technical reviewer and approver of the Project Verification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of UWR Project Verifier oroutsourced entity)
1.	Technical reviewer	Internal	Kumar	Mr. Pankaj	Enviance Services Private Limited
2.	Approver	Internal	Muralikrishna	Vidhya	Enviance Services Private Limited

Means of Project Verification

Desk/document review

A detailed desk review of the PCNMR, methodology and all other associated documentation and references took place in advance of the remote audit, and additional documents that were not available for the desk review were requested for review during the remote audit. Additional information can be required to complete the verification, which may be obtained from other public and reliable sources or through telephone and face-to face interviews with key stakeholders (including the project developers and where necessary, Government and NGO representatives in the host country).

A list of all documents reviewed or referred to in the course of this verification is included in Appendix 3 below.

Off-site inspection

Date of off-site inspection 07/05/2025			
No.	**Activity performed Off-Site**	**Site location**	**Date**
1.	a) An assessment of the implementation and operation of the project activity as per the PCNMR and UWR requirements b) Verification of the project design, as documented is sound and reasonable, and meets the identifiedcriteria of UWR Standard Requirements and associated guidance c) Assessment to conformance with the certification criteria as laid out in the UWR Standards; d) Evaluation of the conformance with the certification scope, including the water	District Crateús and Buriti dos Montes municipality, State Ceará and Piauí, Brazil	07/05/2025

	project and baseline scenarios, additionality; scopes of water project; and the physical infrastructure, activities, technologies and processes of the water project to the requirementsof the UWR; e) Evaluation of the calculation of RoU's, including the correctness and transparency of formulae and factors used; assumptions related to estimating RoU's. f) Review of information flows for generating, aggregating and reporting of the parameters to bemonitored g) To confirm that the operational and data collection procedures can be implemented in accordancewith the Monitoring Plan h) Cross-check of information provided in the submitted documents and data from other sources available at site i) Review of calculations and assumptions made in determining RoU's, and an identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters j) Interviews of local Stakeholders		

Interviews

No.	Interview			Date	subject
	Last name	First name	Affiliation		
1.	Miranda	Gilson	Associação Caatinga (ACAATINGA)	07/05/2025	Project Implementation, Monitoring plan, Project Boundary, Eligibility criteria, Host country requirements, RoU calculations Project implementation, monitoring, Local stakeholder consultation
2.	Pascoal	Cassia			
3.	Kumar	Naveen	Kosher Climate India Private Limited		
4.	Thakur	Prachi			
5.	Barbi	Jorge	Kosher Climate India Private Limited, Brazil Team		
6.	Abrao	Joao			
7.	De Souza	Antonia Rodrigues	Local stakeholders		
8.	Lima	Rita Alves			
9.	Gomes	Maria Núbia Alves			
10.	Dos Santos	Rafaela Martins			

Clarification request (CLs), corrective action request (CARs) and forward action request (FARs) raised

Areas of Project Verification findings	No. of CL	No. of CAR	No. of FAR
Rainwater Offset Units or Water Credits (RoU)			
Identification and Eligibility of project type	-	-	-
General description of project activity	03	-	-
Application and selection of methodologies and standardized sets	-	-	-
- Application of RoU methodologies and standardized data sets	-	-	-
- Deviation from methodology and/or methodological tool	-	-	-
- Clarification on applicability of methodology, tool and/or standardized data sets	-	-	-
- Project boundary and unutilized water sources	-	-	-
- Likely scenario without RoU Project	-	-	-
- Estimation of RoUs	-	-	-
- PCNMR	01	01	-
Start date, crediting period and duration	-	-	-
Positive environmental impacts on water table and/or groundwater recharge and/or water security in the area	-	-	-
Project Owner- Identification and communication	-	-	-
Others (please specify)	-	-	-
Total	04	01	-

Project Verification findings

Identification and eligibility of project type (Approved Project Activities (Positive List))

Means of Project Verification	The project is a rainwater harvesting project located in Brazil. This is confirmed based on the documents, local community guide, design specifications and technical specifications. Detailed examination of documents to verify the correct application was done. Verification of compliance records and other verification of documentation was carried out. Off-Site verification of the project site to was carried out to confirm that activities are implemented as described in PCNMR. Inspection of rainwater harvesting cisterns and associated infrastructure was thoroughly carried out on the basis of the submitted documents. Since the project is a rainwater harvesting project which effectively stores the rain water in designed cisterns for domestic use during non-monsoon season it comes under scope 2 project as per UWR Rainwater (RoU) Standard, version 8.0 (https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/RainWaterOffsetStandardver8_07072515361607895 4.pdf) The Project owner has used valid PCNMR form available at the UWR website for the preparation of PCNMR for the current project activity. The project has prepared PCNMR in line with UWR guidance and requirements.
Findings	No findings raised.
Conclusion	The UWR-approved format is used for description and the project meets the requirement of the UWR RoU verification standard version 2.0 and UWR RoU standard version 8.0. UWR project communication agreement was submitted to the verifier and the same has been verified. Methodology referenced and applied appropriately describing the project type as a rainwater harvesting project which contributes to sustainable water management through construction and maintenance of cisterns which effectively store rainwater reducing the reliance on groundwater and enhancing local water security in Brazil. The eligibility of the project aggregator is verified using the UWR communication agreement, project correctly applies the verification standard, UWR project standard, and UWR regulations. The project activity is overall meeting the requirements of the UWR Verification standard and UWR project standard.

General description of project activity

Means of Project Verification	The project is a rainwater harvesting project located in Brazil. The commissioning date is verified through the program manual of the project. The documents confirm the effective capture and storage of rainwater in this project. Assessment team conducted documentation review of the PCNMR against the UWR RoU verification standard version 2.0 and UWR RoU standard version 8.0 and the UWR-PCNMR-FORM Version 3.0. By checking the supporting documents, it is confirmed that the project is a rainwater harvesting project, the project is located in District Crateús and Buriti dos Montes municipality, State Ceará and Piauí, Brazil Developing and reviewing monitoring reports that document the implementation status of the project was carried out. All the data that is monitored was calculated to verify the outcome generated during monitoring period. The rainfall data and technical specifications were verified through the links provided as a reference and the details of involved communities were verified by the submitted documents. Assessment team performed an offsite inspection of project and confirmed that the location and activities described in the PCNMR are accurate.
Findings	CL 02, CL 03 and CL 04 were raised and closed successfully. More information presented appendix below.
Conclusion	The description of the project activity is verified to be true based on the review of PCNMR, Commissioning details and other submitted documents. The project activity for the Rainwater Harvesting Ponds in Brazil by Acaatinga represents the successful implementation of a sustainable water management system. The project involves the construction and maintenance of cisterns, which effectively capture and store rainwater, thereby reducing reliance on groundwater and river resources. This initiative not only enhances water security and supports agricultural productivity but also contributes to the socioeconomic development of the region by ensuring a sustainable water supply for various industrial and community needs.

Application and selection of water data and calculation parameters

Means of Project Verification

Verification criteria are as per the requirements of UWR RoU program for the scope – 2.
For applicability mentioned in the PCNMR, commissioning details, rainwater program manual, technical specifications, rainfall data were checked.

The rainfall data was collected from National Institute of Meteorology, Brazil (https://portal.inmet.gov.br/).
The catchment area for Households varies in between 50 to 70 m^2, Thus the average catchment area is considered for the calculation i.e., **A= 60 m^2**

The run off coefficient is based on type of area, Type of surface and terrain type of the catchment area, which considers all the types of losses losses due to spillage, leakage, infiltration, catchment surface wetting and evaporation, which will all contribute to reducing the amount of runoff and is considered as 0.40375.

For conservative approach the uncertainty factor of 0.8 (1-0.2) is considered from 2014 to 2021.

Water budget component	Typical estimated uncertainty (%)	Description
Surface inflow	2%	Typical range of accuracy from meters to minimum delivery accuracy requirements of delivery and diversion measurement devices
Precipitation	10%	Typical range of accuracy from field-level rain gauges to extrapolation of local weather station data
Surface outflow	3%	Typical range of accuracy from meters to estimated outflow relationships
Evapotranspiration	NA	Evapotranspiration will not occur as the surface of the water harvesting unit is closed.
Change in storage	NA	The actual amount of water collected by the units is not considered for the RoU calculation.

	<table><tr><td></td><td></td><td>Hence, not applicable.</td></tr><tr><td>**Deep percolation**</td><td>5%</td><td>Typical range of accuracy</td></tr><tr><td>**Total**</td><td>**20%**</td><td></td></tr></table> The baseline scenario assumes that, without the project, rainwater would flow unutilized into drains. The methodology ensures compliance with project goals by aligning water management practices with sustainability objectives. Monitoring and calculation tools support accurate reporting, making it possible to verify the project's impact on water conservation.
Findings	No findings raised.
Conclusion	The project has effectively implemented the cisterns for collection and storage of rainwater following the guidelines of UWR RoU standards by effectively using the rainwater in non-monsoon season and has a positive impact of local hydrology and community water resources. All the calculations including the run off coefficient, catchment area and uncertainty factor were calculated appropriately as per the UWR standards and the Brazilian water data.

Clarification on applicability of tool and/or RoU estimates

Means of Project Verification	The documents reviewed are PCNMR version 2.0 including water data sheets and RoU calculation formulas. RoU estimates by reviewing the flow details, UWR RoU standard, and UWR RoU Verification Standard. Evaluation of the constructed rainwater harvesting cisterns, including their design basics and operational facility. Remote verification methods, such as video inspections and photographic evidence. Cross-checking the formulas for water harvesting potential and RoU calculations against the UWR standard Reviewing baseline scenarios to verify that, without the project, rainwater would have gone unutilized. Assessing the project's impact by comparing baseline and operational data, focusing on reduced reliance on external water sources. Gathering inputs from project stakeholders, including local communities and operational staff, to confirm the implementation and effectiveness of the methodology and tools.
Findings	No findings raised.
Conclusion	The verification team confirms that all the applicability criteria set by the UWR RoU standard are met. The relevant information against those criteria is also included in the PCNMR. The selected scope for the project activity is applicable. The project adheres to UWR standards, ensuring accurate data collection and reliable RoU calculations. By capturing and utilizing unutilized rainwater and contributing to sustainable use of rain water, the initiative supports sustainable water management. Monitoring processes are comprehensive, ensuring continuous compliance and long-term benefits the local community.

Project boundary, sources and RoUs

Means of Project Verification	Conducting remote inspections of the project site to assess the dimensions and design specifications of cisterns within the project boundary. Document Review: Examining the project's documentation, including permits, ownership documents, rain water data, run off coefficient, catchment area and uncertainty factor.
Findings	No findings raised
Conclusion	The project boundary is correctly defined in the PCNMR. The project boundary in this project comprises of cisterns constructed in local communities to collect rain water which enhances the water conservation and sustainability of the local water reserves.

Baseline scenario of the water shed or activity prior to project commissioning

Means of Project Verification	As per the UWR scope 2 project the baseline scenario is as following: *"*Measures for conservation and storage of unutilized water for future requirements including freshwater ecosystems and wetlands.*"* Remote audit conducted and document review showed that in absence of the project activity, the rain water would have been left unutilised due to the absence of rain water collection cisterns. The PCNMR version 2.0 outlines the lack of rainwater harvesting measures before project initiation, with a significant portion of rainfall flowing into storm drains or evaporating. This is substantiated by calculations of runoff coefficients and catchment area data. The PCNMR shows the pre project scenario of external dependency on other water resources for domestic use.
Findings	No findings raised
Conclusion	The baseline scenario shows the difficulties faced by local communities in approach of clean water for domestic use due to semi-arid regions in Brazil. The approved baseline methodology has been correctly applied to identify a realistic and credible baseline scenario, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed UWR project activity. All the assumption and data used by the project participants are listed in the PCNMR and/or supporting documents. All documentation relevant for establishing the baseline scenario are correctly quoted and interpreted in the PCNMR. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable.

Implementation Benefits to Water Security

Means of Project Verification	Examining the PCNMR, commissioning certificate, legal documentation and any other relevant documentation. By conducting interviews with the project proponent, owners. By assessing the rain water data report, construction and maintenance of rain water collection cisterns as well as the impact on local communities if the rain water is left unutilized. Cross-checking the reduction in reliance on other water resources with documented reductions in water shortages. Monitoring the alignment of project outcomes with sustainability goals, such as

	SDG 1 (No poverty), SDG 3 (Good Health and Well Being) and SDG 6 (Clean Water and Sanitation).
Findings	No findings raised.
Conclusion	The implementation of the rainwater harvesting project at Brazil has successfully strengthened water security by providing a sustainable and reliable water source for domestic purpose for local communities. The project has overall effectively reduced the dependency on other water sources. This initiative has ensured use of clean water during periods of water scarcity and contributed to sustainable water management practices. By aligning with environmental and social goals, the project has demonstrated a significant positive impact on water conservation, resource sustainability, and community well-being and alleviate pressure on depleting aquifers. Overall, the project demonstrates effective strategies for reducing dependency for water on external water resources, the project hopes to foster a broader adoption of environmentally responsible approaches within the local communities.

Estimation of RoUs or net water saved/recycled/reused

Means of Project Verification	Remote inspection of the rain water collection cisterns to ensure it matches the project documentation. Examination of PCNMR, Commissioning documents and project plan was carried out and other relevant documentation provided by the project proponent. Measurement Verification was carried out by checking the rain water data. Assess the baseline condition, where rainwater would otherwise remain unutilized or flow into storm drains, to quantify the additionality of water saved or reused due to the project. This provides a clear measure of net water conservation. The net quantity of collected water is calculated based on the rainfall data as per the National Meterological Department, Brazil. RoUs are calculated based the same data. RoU's achieved during the first monitoring period which is from 01/01/2014 to 31/12/2023 as per the Project Activity:

Year	RoUs
2014	781
2015	1,119
2016	1,229
2017	842
2018	2,855
2019	811
2020	3,809
2021	2,102
2022	1,212
2023	4,296
Total	**19,056**

The project is rainwater harvesting project means the water budget component is as follows

Water budget	Typical	Description

component	estimated uncertainty (%)	
Surface inflow	2%	Typical range of accuracy from meters to minimum delivery accuracy requirements of delivery and diversion measurement devices
Precipitation	10%	Typical range of accuracy from field-level rain gauges to extrapolation of local weather station data
Surface outflow	3%	Typical range of accuracy from meters to estimated outflow relationships
Evapotranspiration	NA	Evapotranspiration will not occur as the surface of the water harvesting unit is closed.
Change in storage	NA	The actual amount of water collected by the units is not considered for the RoU calculation. Hence, not applicable.
Deep percolation	5%	Typical range of accuracy
Total	**20%**	

According to the RoU Standard version 8

The formula for calculation for harvesting potential or volume of water received or runoff produced or harvesting capacity is given as:

Option 01:

Harvesting potential or Volume of water utilized (liters) =	**Area of Catchment/Roof/Collection Zone (m^2) X Amount of rainfall (mm) X Runoff coefficient**

Parameters	Value
Annual Avg. Rainfall in mm (I)	589
Average Catchment Area in m^2 (A)	60
Catchment Terrain coefficient	0.85
Run-off coefficient (K)	**0.40375**
Residential-(0.3 to 0.5)	0.5[5]
Uncertainty Factor (2014 to 2021)	**0.8**
Roof inclined or Sloping-(0.85 to 0.95)	0.95

[5] As per UWR standard, version 7.0

Option 1 is being considered to calculate the rainwater harvesting potential, the parameter analyzed are as follows:

Annual Rainwater harvesting Potential

Annual rainwater harvesting potential is given by $V = K \times I \times A$

Where, V=Volume of water that can be harvested annually in liters.

K = Runoff coefficient

I = Annual rainfall in (mm)

A = Catchment area in (m^2)

Rainfall data is as follows

Year	Observed rainfall (mm) for Crateús, Ceará - Brazil	Observed rainfall (mm) for Castelo do Piauí, Piauí - Brazil	Annual Average Rainfall in (mm)
2009	904.4	no data	904
2010	350	903.8	626
2011	941.8	1109.2	1025
2012	244	308.6	276
2013	402.2	434	418
2014	276.6	619.8	448
2015	600	501.6	550
2016	595.2	346.2	470
2017	444.8	124	284
2018	897.4	1030	963
2019	137.6	323.4	230
2020	1080.4	no data	1080
2021	596.8	no data	596
2022	275	no data	275
2023	644.8	1111.4	878

Average catchment area (A): The catchment area for House holds varies in between 50 to 70 m^2, Thus the average catchment area is considered for the calculation i.e., **A= 60 m^2.**

Run-off Coefficient (K): Based on type of area, Type of surface and terrain type of the catchment area, which considers all the types of losses losses due to spillage, leakage, infiltration, catchment surface wetting and evaporation, which will all contribute to reducing the amount of runoff.

Parameters	Type of Area (A)	Different Surfaces (B)	Terrain type (C)	Run-off Coefficient (K) = A*B*C
	Residential	Roof inclined (Sloping)	concrete works	**0.40375**
	0.3 to 0.5	0.85 to 0.95	0.85	
Value	0.5	0.95	0.85	

	considered | | | | | PP has 20% accounted as the uncertainty factor remain conservative. Therefore, an uncertainty factor of 0.8 (1-20%) is applied to all ROUs.
Findings	No findings raised.
Conclusion	In summary, the calculation of RoU's was correctly demonstrated by the PP. It is confirmed by the assessment team that: For the estimation of Rainwater Offset Units (RoUs) or net water collected by rainwater hearvesting in Acaatinga, Brazil, would highlight the successful implementation of a project activity that has effectively collected the rainwater. The quantification tools and calculations detailed in the document indicate a total of 19,056 RoUs (1000 liters each) were collected over the monitoring period from 01/01/2014 to 31/12/2023. This initiative not only collected a significant amount of rainwater that would have otherwise gone unutilised but also contributed to the improvement of local communities, demonstrating the project's positive impact on water security and sustainability in the region. The project serves as a model for similar rainwater harvesting projects, showcasing the benefits of collecting rainwater in enhancing and safeguarding the local water reserves.

PCN+Monitoring Report

Means of Project Verification	Conducting off-site audit to verify the implementation and operation of the rainwater collection cisterns. Examining all relevant documents, such as permits, ownership papers, and maintenance records of the cisterns. Talking to the project proponent about the operation of the unit. Checking the accuracy of reported data, such as the rain water data, catchment area, run off coefficient and uncertainty factor and by evaluating the design and technical aspects of the cisterns to ensure it aligns with the UWR RoU Standard principles.
Findings	CL 01 and CAR 01 were raised and closed successfully. More information presented appendix below.
Conclusion	The verification team is convinced of compliance of the monitoring plan. During the remote audit assessment, the verification team interviewed the PP that the monitoring arrangements described in the monitoring plan are feasible within the project design. The monitoring parameter reported in PCNMR adequately represents the parameters relevant to RoU calculation. The rain water data ensures the accuracy of the data reported. The number of RoU's generation is calculated based on this accurately reported data. The calculation was done using an excel sheet where all the parameters were reported. The comprehensive documentation underscores the project's adherence to its objectives and its contribution to sustainable water management, ensuring compliance with regulatory and environmental requirements. In the PCNMR RoU calculations are correctly calculated and reported. The PCNMR meets the requirements of UWR project verification requirements.

National Water Security Index

Means of Project Verification	During verification it was confirmed that the project reduces dependency on external water sources, aligning with the water resource efficiency goals by the Brazil water security agency. The project ensures alignment with national water security criteria for sustainable groundwater management. Review of rain water data logs to confirm efficient use of harvested rainwater for domestic use. Review of document mentioning improvements in local water availability and ecosystem health. Water security index for Brazil is 0.8 for all beneficiary states[6] As mentioned in the PCNMR, commissioning details and program manual this project is not a groundwater restoration project as the water collected in cistern in through a loop which includes enclosed pipes and gutter system connected to cisterns. Cistern is well coated with 3 layers of waterproofing material to avoid and leakage and regular water levels are been checked to detect and avoid any leakage if any. Ground water restoration can be done if the rain water collection tank is constructed below ground level.
Findings	No findings raised
Conclusion	The verification team on assessment concluded that the project is a rooftop rainwater harvesting project and not a groundwater restoration project. The project ccontributes to the National Water Security goals by enhancing water availability, resource efficiency, and sustainability. The project effectively captures and utilizes rainwater, reducing reliance on external water resources and mitigating water scarcity risks. The initiative has positively impacted local communities and improved access to water for domestic use. By aligning with the goals of resource conservation, operational efficiency, and socio-economic benefits, the project serves as a model for sustainable water management practices under the NWSI framework.

Start date, crediting period and duration

Means of Project Verification	The start date and crediting period of project activity was checked based on the commissioning details, PCNMR and other documents provided. Off-Site verification of the rainwater harvesting infrastructure was conducted to ensure the cisterns were operational as per the claimed start date.
Findings	No findings raised.
Conclusion	The project has chosen crediting period start date as 01/01/2014. The crediting period is chosen as 01/01/2014 to 31/12/2023.

Positive Environmental impacts

[6] ingles.pdf

Means of Project Verification	PP has not claimed any separate positive environmental impact. The project being rainwater harvesting project will reduce the dependency of local communities on external water resources. Monitored documents show the effective use of collected rain water for domestic purpose which benefits the local communities during non-monsoon period. The project activity also prevents the soil erosion.
Findings	No findings raised
Conclusion	Rainwater harvesting project in Brazil have proven to be a significant contributor to positive environmental impacts. The project has reduced reliance on external local water reserves. By mitigating soil erosion, supporting vegetation, and improving biodiversity, the project has contributed to ecosystem restoration in the region. These outcomes demonstrate the project's alignment with environmental sustainability objectives, benefiting both the local ecosystem and the broader community.

Project Owner- Identification and communication

Means of Project Verification	Identity of the project owner was verified through the PCNMR, communication agreement, commissioning details.
Findings	No findings raised
Conclusion	The project owner was identified through a communication agreement signed between project owner and project aggregator. Commissioning detail was also verified and they clearly establish the project ownership. The identification and communication correctly meet the requirement of project verification and UWR project standard. Project owner: Associação Caatinga (ACAATINGA)

Positive Social Impact/Ecological Aspects/Recharge Aspects

Means of Project Verification	During remote audit and also from the submitted documents feedback from local communities and stakeholders to understand the project's impact on water availability for domestic purposes. Document improvements in community livelihoods, such as reduced water scarcity during non-monsoon period. Project activity has also prevented soil erosion by preventing run off of unutilized rain water. Review improvements in water access and infrastructure that benefit local communities. Project has provided temporary employment to local farmers during construction of cisterns. Overall social impact of project implementation is positive on the surrounding area. Also, The PP has showcased the successful utilization of collected rain water, thus saving millions of liters of rainwater from getting unutilized. The project activity showcases best-in-class rain water harvest system that can reduces the dependency of local communities on external water resources.
Findings	No findings raised.

Conclusion	Project has overall social positive impact and ecological positive impact. The project has ensured a reliable water supply for domestic use. Ecological improvements, reduced soil erosion, and enriched biodiversity, demonstrate the project's role in supporting environmental restoration. Socially, the project has alleviated water scarcity, strengthened community resilience, and fostered equitable access to water resources. These outcomes align with the project's objectives of sustainable water management, ecological conservation, and social well-being, making it a model for integrated resource management.

Sustainable development aspects

Means of Project Verification	PP has claimed SDG Goals 1, 3 and 6 **SDG 1(1.4) is no poverty** which ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance. During assessment it was verified that Proportion of population living in households with access to basic services like access to clean collected rain water for domestic use. **SDG 3 (3.9) is good health and well-being** and it is verified during remote audit. PP showcases how clean collected rain water has reduced the mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services). **SDG 6 is clean water and sanitation** Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all. Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity. During assessment it was verfied that the local communities in Brazil have now access to clean and safe water for domestic use through rain water collected in well designed cistern. People now have access to fresh and clean drinking water and reduced the withdrawal of water from external watre resources.
Findings	No findings raised.
Conclusion	The project has the capability to address SDG 1, 3 and 6.

Internal quality control

The verifier confirms that,

- Due professional care has been taken while reviewing the submitted document.
- There is no conflict of interest as the verifier has no other engagement with either the aggregatoror project owner directly or indirectly.
- Verification team consists of experienced personnel.

Project Verification opinion

Assessment team conducted documentation review the PCNMR against the UWR RoU verification standard version 2.0 and UWR RoU standard version 8.0 and the UWR-PCNMR FORM Version 3.0.
It is confirmed that the project activity is a rooftop rainwater harvesting project, that is located in District Crateús and Buriti dos Montes municipality, State Ceará and Piauí, Brazil.

Assessment team performed an offsite audit and confirmed that the location described in the PCNMR is accurate. The verification was performed on the basis of UWR requirements, and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases:

i) Desk review of the PCNMR and additional background documents;

ii) Follow-up interviews with project stakeholders;

iii) Resolution of outstanding issues and the issuance of the final verification report and opinion.

The project correctly applies the approved baseline and monitoring methodology.

The monitoring plan provides for the monitoring of the project's Rainwater Offset Unit (RoU) calculations. The monitoring arrangements described in the monitoring plan are feasible within the project design, and the project participants are able to implement the monitoring plan. Given that the project is implemented and maintained as designed, the project has achieved the RoU's of 19,056 RoU's during the monitoring period i.e. from 01/01/2014 to 31/12/2023.

The review of the project design documentation and the subsequent follow-up interviews have provided assessment team with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all applicable UWR requirements. Assessment team thus requests the registration of the proposed UWR project activity.

Appendix 1. Abbreviations

Abbreviations	Full texts
UWR	Universal Water Registry
PCNMR	Project Concept Note and Monitoring Report
NGO	Non-Governmental Organization
CAR	Corrective Action Request
CL	Clarification Request
RWH	Rainwater Harvesting
RoU	Rainwater Offset Unit
DPR	Detailed Project Report

Appendix 2. Competence of team members and technical reviewers

❖ **Ms. Ritu Singh** has done Masters in Environmental Science from Central University of South Bihar, Gaya and bachelor of Science in Zoology from Magadh Mahila College, Patna University, India. She has done Masters' research focused on solid waste management during and post covid-19 pandemic and conducted a survey in Medical Colleges of Bihar to study the trends of waste management. She has more than 2 year working experience in True Quality Certifications Pvt. Ltd. (An outsource entity for LGAI Technological Center, S.A. (Spain) "Applus+ Certification") and has been involved in supporting Audit teams for Validation and Verifications of Project Activities (Renewable and non-Renewable projects) under CDM/VCS/GS4GG/GCC programs. Currently, Ritu is engaged as an internal resource with Enviance Services Private Limited, where she is accredited as a Lead Auditor, Validator, Verifier, and Technical Expert for Sectoral Scope/Technical Area 1.2 by Enviance.

❖ **Ms. Swati Mahajan** is graduate in Environmental Engineering from Shivaji University, India and previously worked as an Environment Engineer at Eco Designs India Private Ltd., Pune. She is adept in designing of landfill sites for solid waste management. She also has hands on experience in cost benefit analysis and preparation of DPRs for SWM projects. She also has done a certified course in carbon capture and storage from Edinburg University. Currently working as GHG assessor for projects under various GHG mechanisms like GCC, ICR, UCR and VERRA.

❖ **Mr. Pankaj Kumar** worked as team leader – Bihar for South Asia Climate Proofing and Growth Development (CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO (Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA, Applus certification as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1, 4.1, 13.1 by Enviance. He is also member of task force on climate change & human health, Health Department, GoB and on roster of UNICEF's WASH experts. He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing. Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

❖ **Mr. Prakhar Shastri** has done Bachelor of Technology in Electronic Communication Engineering from Medicaps University, Indore. Currently, He is working in Enviance Services Private Limited and has been involved in supporting Audit teams for Verifications of Project Activities (Renewable and non-Renewable projects) under various registries like GCC.

Appendix 3. Document reviewed or referenced

No.	Author	Title	References tothe document	Provider
1	NA	Communication agreement		Project Owner
2	NA	Project Concept Note and Monitoring Report		Aggregator
3	NA	RoU Calculation sheet		Aggregator
4	NA	Declaration on avoidance of doublecounting		Aggregator
5	NA	Commissioning Certificates for the ETP		Aggregator
6	NA	Water flow details/log book details for thecomplete monitoring period		Aggregator
7	NA	Calibration certificates for water meters		Aggregator
8	UWR	UWR RoU Program manual version 2.0 UWR RoU standard version 8.0 UWR RoU Verification standard version 2 UWR terms and conditions version 7.0		Universal Water Registry

Clarification request, corrective action request and forward action request

Table 1. CLs from this Project Verification

Classification	☐ **CAR** ☒ **CL/CR** ☐ **FAR**	**Number:**	**01**
Raised by:	**Ms. Ritu Singh**	**Document Reference**	**PCNMR**
Finding Description		**Date:**	**10/05/2025**
As per PCNMR version 3.0, PP shall update the section A.2, A.3, A.6 and A.13 of PCNMR by adding information as mentioned in PCNMR.			
Client/Responsible Party/Project Proponent Response		**Date:**	**22/07/2025**
The sections A.2, A.3, A.6 and A.13 of the PCNMR has been updated with the necessary information related to the project.			
Validation/Verification Team Assessment		**Date:**	**24/07/2025**
PP has updated the sections A.2, A.3, A.6 and A.13 of the PCNMR. During assessment it was observed that all the sections in PCNMR are now inline with the PCNMR version 3.0. Hence, CL 01 is closed.			

Classification	☐ **CAR** ☒ **CL/CR** ☐ **FAR**	**Number:**	**02**
Raised by:	**Ms. Ritu Singh**	**Document Reference**	**PCNMR**
Finding Description		**Date:**	**10/05/2025**
As per UWR RoU verification standard version 2.0, PP shall submit an undertaking for no double counting for current monitoring period and for project activity has neither been registered nor seeking registration under any other water registry or sustainable development programs.			
Client/Responsible Party/Project Proponent Response		**Date:**	**22/07/2025**

A declaration by the project proponent has been provided stating that the project is not submitted under any other GHG program for registration to ensure no double counting.		
Validation/Verification Team Assessment	**Date:**	**24/07/2025**
PP has submitted the no double counting certificate for the current monitoring period. During assessment it was found that the project activity has neither been registered nor seeking registration under any other water registry or sustainable development programs. Hence, CL 02 is closed.		

Classification	☐ **CAR** ☒ **CL/CR** ☐ **FAR**	**Number:**	**03**
Raised by:	**Ms. Ritu Singh**	**Document Reference**	**PCNMR**
Finding Description		**Date:**	**10/05/2025**
1. PP shall submit the legal ownership document of the project activity. 2. PP shall submit the detailed project report of the activity (preferably in english).			
Client/Responsible Party/Project Proponent Response		**Date:**	**22/07/2025**
1. The legal ownership of the unit lies with the users and the rights of RoUs have been transferred to the Associação Caatinga by all the users of the cisterns implemented under the project. 2. The document detailing the overview of the project has been submitted			
Validation/Verification Team Assessment		**Date:**	**24/07/2025**
1. The Project Participant (PP) has submitted documentation demonstrating that the legal ownership of the units resides with the individual users. Additionally, the Rights of Use (RoUs) for all cisterns implemented under the project have been formally transferred to Associação Caatinga by these users. During the assessment, all relevant documents were verified, and it was confirmed that the users' names were accurately recorded and aligned with project records. 2. The Project Participant (PP) has submitted a document outlining the overall overview of the project. During the assessment, it was verified that the submitted details related to monitoring activities and implementation procedures appropriately reflect the scope and execution of the project. All information provided was found to be consistent and aligned with the project's operational framework. Hence, CL 03 is closed.			

Classification	☐ **CAR** ☒ **CL/CR** ☐ **FAR**	**Number:**	**04**
Raised by:	**Ms. Ritu Singh**	**Document Reference**	**PCNMR**
Finding Description		**Date:**	**10/05/2025**
As per UWR verification report format, PP shall submit the names of the local stakeholders.			
Client/Responsible Party/Project Proponent Response		**Date:**	**22/07/2025**
The names of the beneficiaries involved in the project activity have been provided in the excel spreadsheet format			
Validation/Verification Team Assessment		**Date:**	**24/07/2025**
PP has submitted the names of the local stakeholders. Hence, CL 04 is closed.			

Table 2. CARs from this Project Verification

Classification	☒ **CAR** ☐ **CL/CR** ☐ **FAR**	**Number:**	**01**
Raised by:	**Ms. Ritu Singh**	**Document Reference**	**PCNMR**
Finding Description		**Date:**	**10/05/2025**
As per the link mentioned in PCNMR, UNDP indicator as per 2023 is 0.786. PP shall recheck the value. Correction sought.			
Client/Responsible Party/Project Proponent Response		**Date:**	**22/07/2025**
The UNDP indicator for the Country Brazil has been updated as 0.786 in line with the United Nations Development Programme (https://hdr.undp.org/data-center/country-insights#/ranks)			
Validation/Verification Team Assessment		**Date:**	**24/07/2025**
As suggested PP has revised the value of UNDP indicator. During assessment it was verified that the value is now inline with the United Nations Development Programme (https://hdr.undp.org/data-center/country-insights#/ranks). The same was verified in updated version of PCNMR. Hence, CAR 01 is closed.			

Table 3. FARs from this Project Verification

~~**FAR ID**~~	~~xx~~	~~**Section no.**~~		~~**Date:** DD/MM/YYYY~~
~~**Description of FAR**~~				
~~**Project Owner's response**~~				~~**Date:** DD/MM/YYYY~~
~~**Documentation provided by Project Owner**~~				
~~**UWR Project Verifier assessment**~~				~~**Date:** DD/MM/YYYY~~