

Technical Assistance Closure Report Template

Objective of the technical assistance (TA) Closure Report:

- To communicate publicly in one document a summary of progress made and lessons learned during the TA towards the anticipated impact (sections 1-4).
- To document qualitative and quantitative data collected during TA, for use in donor and UN reporting (Annex 1).

Steps for completing the TA closure report:

- The lead TA implementer submits the closure report at the end of the technical assistance as a final deliverable. The TA closure report will capture outputs, outcomes and impacts of all activities conducted under the TA. Please copy and summarise relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
- A CTCN Manager will review and revise the closure report before final approval by the CTCN Deputy Director.

Important note on public and internal use of the closure report:

Once approved by the CTCN Deputy Director, the TA closure report will be a public document available on the CTCN website www.ctc-n.org. Selected content will be used for targeted communication activities. Annex 2 is for internal use only and will not be publicly available.

Closure Report for CTCN Technical Assistance

1. Basic information

Title of response plan	<i>EC-CTCN Climate Change and Security Programme, Organic waste management project, targeting women and young people in particular, using inflatable tanks</i>
Technical assistance reference number	CTCN-24/009 - 2023000035
Country / countries	Haiti
NDE organisation	<i>Direction Changements Climatiques du Ministère de l'Environnement (Mde-Haïti),</i>
NDE focal point	<i>Yves Bernard Remarais, Point Focal CTCN</i>
NDE contact information	<i>ybremares@gmail.com , Parc Industriel (SONAPI), Boulevard Toussaint Louverture, Port-au-Prince, HAÏTI</i>
Proponent focal point and organisation	<i>Agri Climato All, Rools Pierre, Chairman of the Board of Directors, roolsp@aol.com, 270, Autoroute de Delmas, Port-au-Prince, HAÏTI</i>
Designer of the response plan	<i>Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE)</i> <i>Local Consultant, Roberto Chery supporting Agro climato All</i> <i>Ministère de l'Environnement (Mde-Haïti)</i>

Implementer(s) of technical assistance	• Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE)), • Local Consultant to be confirmed • Ministère de l'Environnement (MdE-Haïti)
Beneficiaries	<i>The Community of Fressnard, Haiti</i>
Sector(s) addressed	<i>Instruction: Select relevant sector(s) from the CTCN taxonomy https://www.ctc-n.org/resources/ctcn-taxonomy</i> <i>Renewable Energy (biodigester & biogas production), and Agriculture (using agriculture waste)</i>
Technologies supported	<i>Biodigester</i>
Implementation start date	<i>04/11/2024</i>
Implementation end date	<i>15/12/2025</i>
Total budget for implementation	<i>Up to US\$180, 000</i> <i>The project's total approved budget of up to US\$180,000 was fully expensed over the implementation period. While overall financial discipline was maintained, several significant budgetary adjustments were required during execution to respond to contextual realities on the ground. These adjustments were primarily linked to higher-than-anticipated local operational costs, including security arrangements, transportation, and logistics, as well as scheduling adaptations necessitated by access constraints and evolving local conditions. Notably, the original budget framework did not fully account for the true cost of operating within Haiti's complex security and logistical environment, requiring agile reallocation across budget lines to sustain implementation momentum. Despite these constraints, the budget demonstrated sufficient flexibility to accommodate shifts in the project's general scope while safeguarding the quality and integrity of technical outputs. All major planned activities and contractual deliverables were completed within the agreed financial envelope. A limited number of pivoted and follow-on deliverables will be finalized by the project proponents in Q1 2026, with monthly monitoring and oversight provided by the implementing agency, CCREEE. Overall, the technical assistance successfully achieved its intended objectives within a controlled and acceptable financial framework, underscoring both effective financial management and adaptive project execution in a highly challenging operating context.</i>
Description of delivered outputs and products as well as the activities undertaken to achieve them. In doing so, review the log frame of the original response plan and refer to it as appropriate	<i>This final project close report presents a consolidated account of the technical assistance delivered under the EU/CTCN Climate Change and Security Programme for the piloting of inflatable biodigesters in Kenscoff, Haiti. It summarises the key outputs, products, and activities implemented in line with the original CTCN Response Plan and logical framework. The section that follows demonstrates how the project adapted to Haiti's complex operational, security, and logistical context while remaining results-focused, inclusive, and aligned with its core objective of strengthening organic waste</i>

management, climate resilience, and livelihood opportunities for women, youth, and vulnerable communities.

Output 1 – Development of Planning, Monitoring, and Communication Frameworks

In line with Result 1 of the Response Plan, the project successfully delivered the full suite of foundational planning and governance products required to guide implementation and reporting. These included a detailed work plan, implementation schedule, Monitoring & Evaluation (M&E) Plan, impact description, gender and inclusion considerations, and agreed EU/CTCN indicators, all of which established a clear baseline for execution and evaluation .

To achieve this output, CCREEE convened an initial kick-off meeting with the Ministry of Environment (MdE-Haïti), the Designated National Entity, Agri-Climato All, consultants, and UNEP/CTCN, validating roles, timelines, and change-management protocols. Regular coordination and reporting mechanisms were then operationalised, ensuring adaptive management in response to Haiti's evolving security, logistical, and access constraints. Despite contextual delays, all planning instruments were completed and formally submitted, providing a robust governance framework that enabled agile decision-making throughout implementation.

Output 2 – Needs Assessment and Definition of Biodigester Specifications

Consistent with Result 2 of the logframe, a comprehensive community needs assessment and baseline analysis was completed for the locality of Fessard, Kenscoff. This included stakeholder mapping (with gender and youth disaggregation), diagnosis of existing agricultural practices, livestock and organic waste availability, cooking habits, and current energy sources, as well as identification of barriers and opportunities for biodigester adoption .

Activities undertaken included field missions, structured interviews with farmers, women, youth, and vulnerable groups, and consultations with local authorities and sector actors. Findings were consolidated into a community biogas needs definition and an initial impact assessment, which were subsequently validated through a local workshop involving the Steering Committee and community representatives. These outputs directly informed technology selection and system design, ensuring contextual relevance and social acceptance.

Output 3 – Definition of Biodigester System Architecture and Financing Model

Under Result 3, the project delivered a comparative technical assessment of biodigester technologies available in Haiti and the wider region, drawing on case studies from Haiti, Mexico, Guyana, and East Africa. The

	<i>analysis assessed fixed-dome, floating-drum, batch, and flexible (inflatable) systems against criteria of cost, durability, operational simplicity, feedstock requirements, and suitability to Kenscoff's climatic and socio-economic conditions .</i> <i>Based on this assessment, a flexible (inflatable) biodigester architecture was selected and preliminarily sized, alongside a cost study and evaluation of financing approaches, including Pay-As-You-Go (PAYG) and cooperative models. Workshops were held to present and validate the proposed system architecture and business model with stakeholders. While detailed final sizing requires additional site-specific data, the architecture and financing framework were completed and endorsed, fulfilling the logframe requirements for this output.</i> Output 4 – Biodigester Deployment, Training, and Impact Review <i>In accordance with Result 4, the project advanced the operationalisation phase with a strong focus on capacity building, demonstration, and preparedness for deployment, while adapting to significant mobility, security, and logistical constraints. Initial plans to implement a regional, in-person train-the-trainers programme were actively pursued, including the issuance of visa support letters and the exploration of multiple international travel routes for key Haitian counterparts. However, persistent visa access barriers and the limited effectiveness of training a single government representative led to a strategic decision to shift from in-person international training to comprehensive online capacity building, delivered in collaboration with BioGas World. This approach ensured continuity of technical knowledge transfer while maintaining inclusivity and alignment with the project's sustainability objectives. Concurrently, extensive technical engagement with international suppliers highlighted increasing risks associated with importing inflatable biodigesters into Kenscoff, including transport insecurity, extended shipping timelines, and concerns over long-term durability and thermal stability. In response, and to safeguard tangible community benefits, CCREEE, UNEP, and the beneficiary jointly agreed to revise the technology approach. A locally designed and constructed reinforced concrete (dome-type) biodigester, proposed by Cosmos Solution Haiti, was identified as a viable and context-appropriate alternative. This system enables both biogas production for clean cooking and liquid organic fertiliser generation, with on-site installation and hands-on community training planned for Q1 2026. An impact review framework, including indicators and interview tools, has been finalised, and CCREEE will continue monthly monitoring to ensure accountability, knowledge transfer, and sustained community-level outcomes beyond the formal TA period.</i>
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Output 5 – Communication Strategy and Enabling Environment for Scale-Up

Aligned with Result 5, the project delivered a detailed Communication Strategy and Roadmap to support awareness, replication, and private-sector engagement for biodigesters in Haiti. The strategy outlines inclusive, multi-channel outreach approaches; community meetings, radio, social media, demonstrations, and Creole-language materials with women and youth positioned as primary beneficiaries and agents of change

While a standalone private-sector development roadmap was not produced as a discrete deliverable, market and financing considerations relevant to private-sector participation were substantively addressed under Activity 3.2, through the cost study of biodigester technologies identified in Activity 3.1. This analysis examined typical installation costs, prevailing financing mechanisms, and lessons from comparable regional and international deployments, with particular emphasis on affordability and long-term system sustainability.

The cost study confirmed that biodigester financing globally relies on a mix of public subsidies, donor grants, concessional loans, and private investment, with unit costs varying significantly by scale and application. In Haiti, sanitation-focused biodigesters integrating sanitation, biogas, and bio-slurry production were found to cost approximately USD 18,000 per unit, with systems historically funded by NGOs and development partners. By comparison, small household systems in Kenya typically range from USD 600–900, supported by 20–30% subsidies transitioning toward incentive-based mechanisms, while small to medium farm-scale systems in Mexico range from USD 4,000–20,000 with 30–50% government support. At the industrial scale, Mexican biodigesters were observed to cost approximately USD 170,000 per unit, supported by subsidies of USD 50,000–70,000.

The study further highlighted the relevance of Pay-As-You-Go (PAYG) financing models, particularly in low-income and fragile contexts such as Haiti. Evidence from prior Haitian deployments indicated that PAYG-supported biodigesters remained operational for up to four years post-commissioning, outperforming fully grant-financed systems in terms of longevity. Under PAYG arrangements, users make incremental payments through either time-based subscriptions or usage-based (metered) payments, gradually covering capital and installation costs. Once these costs are recovered, ownership can be transferred to the community, while continued revenue streams can support ongoing maintenance, servicing, and system management, thereby strengthening sustainability. Although not framed as a formal roadmap, these findings collectively provide a practical foundation for future

	<i>private-sector engagement, demonstrating viable cost ranges, financing structures, and business models that could support local installation, servicing, and long-term operation of biodigesters in Haiti under scaled-up programming.</i> <i>Across all five outputs, the technical assistance met its intended objectives within an acceptable and controlled implementation framework. While Haiti-specific security, access, and logistics constraints required sequencing adjustments, the scope was delivered with agility, and all core deliverables defined in the original Response Plan were completed or are on a clearly monitored completion pathway. The project has established a strong technical, institutional, and community foundation for continued biodigester deployment in Kenscoff and replication nationally, fully aligned with the original CTCN logframe and EU Climate Change and Security Programme objectives.</i>
Methodologies applied to produce outputs and products	<i>The project applied a phased, adaptive, and participatory methodology aligned with the CTCN Response Plan and logical framework, combining technical analysis, stakeholder engagement, and iterative validation to deliver the planned outputs and products within Haiti's complex operating context. From inception, implementation was grounded in results-based management, with activities sequenced to move from planning and diagnostics, through technical design and costing, to capacity building, communication, and preparation for deployment.</i> <i>At the outset, document review and inception planning methodologies were used to translate the approved Response Plan into a detailed work plan, implementation schedule, and Monitoring and Evaluation framework. These tools established clear baselines, SMART indicators, and reporting protocols, enabling continuous tracking of progress and informed decision-making. Regular coordination meetings and structured reporting cycles allowed for adaptive management, ensuring timely adjustments in response to security, logistics, and access constraints.</i> <i>For needs assessment and specification of the biodigester system, the project employed mixed-methods community diagnostics, combining field missions, semi-structured interviews, stakeholder mapping, and gender-sensitive consultations. This approach ensured that technical design considerations were informed by local agricultural practices, organic waste availability, energy-use patterns, and socio-economic realities, while deliberately incorporating the perspectives of women, youth, and vulnerable groups. Validation workshops were then used as a participatory quality-control mechanism, allowing community and institutional stakeholders to review</i>

	<i>findings and confirm priorities before advancing to system design.</i> <i>Technical outputs were developed using comparative technology assessment and benchmarking methodologies, drawing on regional and international case studies to evaluate biodigester options against cost, durability, operational simplicity, maintenance requirements, and suitability to Haiti's climatic conditions. This was complemented by cost-modelling and financing analysis, including examination of subsidy structures and Pay-As-You-Go models, to assess affordability and long-term sustainability. Iterative consultations with technical experts and local partners ensured that recommendations remained feasible under prevailing security and logistical conditions.</i> <i>Capacity building and knowledge transfer relied on a blended training methodology, initially designed around in-person, hands-on learning but subsequently adapted to include structured online training and localized implementation. Training frameworks, demonstration plans, and user guidance were developed to support progressive skills transfer, while prioritizing inclusivity and practical application. In parallel, an impact review methodology was established, combining qualitative interviews and indicator-based assessment to capture anticipated environmental, social, and economic outcomes during and after piloting.</i> <i>Finally, communication and scale-up activities applied a strategic communication and ecosystem-building methodology, integrating stakeholder analysis, multi-channel outreach design, and policy and market scanning. While not formalized as a standalone private-sector roadmap, this approach generated actionable insights into barriers, enablers, and financing pathways for future biodigester deployment. Collectively, these methodologies ensured that outputs and products were technically robust, context-responsive, and aligned with the project's objectives of sustainability, inclusivity, and long-term impact in Haiti.</i>
Reference to knowledge resources	<u><i>Instruction:</i></u> Please indicate if any UNFCCC Technology Executive Committee (TEC) knowledge products (publications, briefs, tools etc.) were used in the implementation of the TA request, and which. <i>Link to TEC knowledge database:</i> https://unfccc.int/ttclear/tec/documents.html <i>Not Applicable to this project.</i>
Deviations	<i>The most substantive deviation is in the type technology to be implemented, while a biodigester is still being implemented it is not inflatable. In response, and to safeguard tangible community benefits, CCREEE, UNEP, and the beneficiary jointly agreed to revise the</i>

	technology approach. A locally designed and constructed reinforced concrete (dome-type) biodigester, proposed by Cosmos Solution Haiti, was identified as a viable and context-appropriate alternative. This system enables both biogas production for clean cooking and liquid organic fertiliser generation, with on-site installation and hands-on community training planned for Q1 2026. An impact review framework, including indicators and interview tools, has been finalised, and CCREEE will continue monthly monitoring to ensure accountability, knowledge transfer, and sustained community-level outcomes beyond the formal TA period. There is no other substantive deviations from the approved technical assistance scope were encountered during implementation. However, the project required context-driven adjustments in response to Haiti's operating environment, including security-related access limitations, international mobility and visa constraints, and intermittent delays in stakeholder engagement due to competing institutional and community priorities. These factors necessitated the rephrasing of several activities and adjustments to indicative timelines, resulting in an extension of the overall schedule. Despite these adaptations, the project maintained full alignment with the original objectives and logical framework, and all major outputs were delivered as planned, with remaining site-level actions sequenced for completion under continued monitoring arrangements.
Anticipated follow-up activities and next steps	In light of the compounded security, logistical, and international mobility constraints encountered during implementation, and to ensure that the technical assistance delivers a tangible and lasting community benefit, CCREEE, UNEP, and the beneficiary jointly agreed on a revised and pragmatic pathway forward beyond the formal project closure. This adaptive approach safeguards the project's development objectives while responding realistically to Haiti's prevailing operational conditions. The project will transition from the originally envisaged imported inflatable biodigester to a locally delivered solution provided by Cosmos Solution Haiti, based on a semi-industrial reinforced concrete (dome-type) biodigester designed and constructed in Haiti. The selected system comprises a 10 m³ digester capable of processing approximately 150–170 kg of organic waste per day, producing both biogas for clean cooking and liquid organic fertiliser for agricultural use. The technical proposal, including the detailed bill of quantities and materials list, confirms the feasibility of local procurement, construction, transport, and on-site installation, as well as hands-on community training, at an estimated total cost of USD 36,873.15. While this technology differs from the inflatable biodigester originally proposed in the Response Plan, the transition enables implementation under Haiti's current

	security, logistics, and mobility realities, significantly reducing exposure to import risks, transport insecurity, and reliance on international travel. Importantly, the revised approach remains fully aligned with the project's core objectives, including organic waste valorisation, clean and affordable cooking energy, capacity building at community level, support to the local Haitian private sector, and inclusive participation of women, youth, and vulnerable groups. Implementation of the revised pilot will be led by Agri-Climato All in Q1 2026, with full funding disbursed to the beneficiary by the end of Q4 2025 to enable uninterrupted execution on the ground. Activities will include system construction and commissioning, community-based training on operation and maintenance, and initial monitoring of biogas and fertiliser use. This phase will ensure that the community of Fessard, Kenscoff, benefits from a fully operational biodigester and associated skills transfer, despite the constraints faced during the original implementation period.
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2. Lessons learned

	Lessons learned	Recommendations
Lessons learned from the CTCN TA process	Describe lessons learned from following the steps of the TA process and interacting with the CTCN Secretariat. What were the challenges and essential factors contributing to successful implementation	The implementation of this technical assistance generated several important lessons regarding both the strengths of the CTCN TA delivery model and areas where further adjustments could enhance effectiveness, particularly in fragile and high-risk contexts such as Haiti. Overall, the process demonstrated that the CTCN mechanism remains a highly relevant and catalytic instrument for advancing climate technology deployment when applied with flexibility and strong local engagement. A key lesson relates to the alignment of indicative TA timelines with local operational realities. While the CTCN process is well structured and methodologically sound, the pace of implementation was affected by competing priorities among national institutions, limited availability of key counterparts, and intermittent access constraints at the local level. These factors resulted in delays in consultations, feedback loops, and validation steps. In such contexts, additional built-in flexibility at the outset—particularly around

	<i>stakeholder availability and security-related access—would further improve delivery efficiency without compromising technical rigor. The project also underscored the importance of iterative and adaptive design processes in climate technology deployment. The sequential approach adopted—community diagnostics, technology benchmarking, system design, costing, and validation—proved effective in producing a coherent and context-appropriate solution. However, the process required more iteration than initially anticipated as new technical, logistical, and security considerations emerged. In this regard, the responsiveness, flexibility, and technical guidance of the CTCN Secretariat were critical in maintaining momentum, ensuring compliance with CTCN standards, and supporting informed decision-making throughout implementation.</i> <i>Regular engagement with the National Designated Entity (NDE) contributed positively to institutional alignment and legitimacy, particularly in navigating approvals and maintaining coherence with national climate and energy priorities. At the same time, the project highlighted the value of strong ownership by the local implementing partner and its dedicated consultant Agri-Climato All partner and its dedicated consultant, whose active involvement ensured that outputs remained grounded in field realities, practically oriented, and responsive to community needs. This ownership was a decisive factor in sustaining progress despite external constraints.</i> <i>Conversely, the experience suggests that the project could have benefited from more consistent and proactive engagement from Haitian government counterparts, particularly in facilitating logistics, coordination, and implementation support. In fragile settings, stronger institutional anchoring and clearer government-led facilitation mechanisms may help mitigate delays and reduce reliance on adaptive workarounds.</i>
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		Overall, the technical assistance reaffirmed the value of the CTCN TA model as a catalyst for climate technology deployment, particularly when supported by flexible implementation, sustained stakeholder dialogue, and strong local ownership. The project demonstrated that success in complex contexts depends less on rigid adherence to timelines and more on adaptive management, continuous engagement, and constructive collaboration among the CTCN Secretariat, national institutions, implementing partners, and beneficiary communities.
Lessons learned related to climate technology transfer	Describe lessons learned, opportunities, and barriers for the use and deployment of the technology or technologies supported by the TA. The objective is to identify specific success factors for technology transfer	The technical assistance generated valuable lessons on the use, transfer, and deployment of inflatable biogas technology in fragile and resource-constrained contexts such as Haiti, while also highlighting the importance of flexibility in technology selection as a critical success factor for effective project delivery. Lessons Learned. A key lesson is that while inflatable biogas systems offer advantages in terms of lower upfront costs, rapid installation, and modular design, their successful deployment is highly dependent on context-specific enabling conditions. In the case of Kenscoff, the feasibility of inflatable systems was constrained by security risks along transport corridors, dependence on international supply chains, limited local repair capacity, and vulnerability of the material to puncture, temperature fluctuations, and misuse. The TA also demonstrated that technology transfer cannot be treated as a linear process; rather, it requires iterative assessment, testing of assumptions, and continuous validation against local realities. Importantly, the ability of the CTCN TA process to allow a technology pivot from an imported inflatable system to a locally built dome-type biogas system was instrumental in preserving project outcomes and community benefit, and

		<i>should be considered a core success of the intervention.</i> <i>Opportunities.</i> <i>The TA confirmed that inflatable biodigesters remain a potentially viable option for future deployment in Haiti and similar contexts where security conditions improve, logistics are simplified, or where systems can be locally assembled or manufactured. Opportunities exist to integrate inflatable digesters into pilot-scale sanitation or agricultural waste projects, particularly where temporary or mobile installations are required. The analysis also identified Pay-As-You-Go (PAYG) financing models as a strong opportunity to improve affordability, ownership, and long-term functionality of biodigesters, regardless of the specific technology type. Furthermore, the growing interest among local actors in waste valorisation, clean cooking, and organic fertiliser presents an opportunity to embed biodigesters within broader climate-smart agriculture and livelihood programmes.</i> <i>Barriers.</i> <i>Significant barriers were identified for inflatable biodigesters in the Haitian context. These include import dependency, exposure to high logistical and security risks, limited access to replacement parts, and lack of trained local technicians for repair and maintenance. Temperature variability and water availability further complicate the operation of inflatable systems, which typically require wet-process conditions and stable thermal ranges. Institutional barriers were also evident, including limited government facilitation for customs clearance, transport security, and deployment approvals. These constraints collectively reduced the viability of inflatable biodigesters under current conditions.</i> <i>Success Factors for Technology Transfer.</i> <i>The most critical success factor emerging from this TA was flexibility in</i>
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		<i>technology choice and delivery pathways. Rather than rigidly pursuing the originally proposed technology, the project maintained focus on the intended development outcomes; organic waste management, clean cooking, capacity building, and community benefit and adapted the technological solution accordingly. Additional success factors included early and continuous community engagement, strong local partner ownership, iterative technical assessment, and supportive CTCN Secretariat guidance. Together, these elements demonstrate that effective technology transfer in fragile contexts depends less on the specific technology itself and more on adaptive management, local feasibility, and the ability to pivot without compromising objectives.</i>
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3. Illustration of the TA and photos

For communication purposes, please provide 2-4 Power Point slides, including illustrations or charts, describing barriers, opportunities, methodology, activities, outputs and achieved results. The illustrations must be copied into the TA Closure report but must also be delivered as power point files. Also, please provide at least five high-resolution pictures in jpg format, capturing technical assistance. The pictures should illustrate how the TA has impacted the lives of the beneficiaries in particular and the communities in general.

This will be submitted as a standalone document.

Images can be found here: [Project Steering Committee \(PSC\), Shared Folder, Haiti Inflatable Biodigesters Project](#)

4. Impact Statement

The information in the table below will be used to communicate results and anticipated impacts of this technical assistance publicly. Please copy information from impact statement developed in the M&E Plan and update as relevant.

Challenge	Infrastructure limitations in rural areas: Limited access to organic fertilizer and clean cooking fuel due to underdeveloped supply chains and lack of proper waste management systems. Security issues: Concerns regarding safety and stability in the project area, which can affect access to resources, community participation, and long-term sustainability of the intervention.
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	Rural population commitment: Encouraging continuous community engagement and participation, given existing socio-economic challenges and competing daily priorities. Potential deficiencies in installed inflatable biogas: Ensuring effective operation and maintenance of biogas in a setting where technical expertise and repair services are limited. Effective stakeholder engagement: Addressing hesitancy from local authorities, farmers, and community members by demonstrating the benefits and reliability of biogas technology. Sustained funding and support: Securing ongoing financial and institutional backing to ensure that the project extends beyond initial technical assistance, particularly in a volatile economic and political climate.
CTCN Assistance	- Continued and targeted support from the CTCN proved critical in enabling the technical assistance to respond effectively to the complex and interlinked challenges encountered in Kentsch. In a context characterised by limited rural infrastructure, weak organic fertiliser supply chains, and constrained access to clean cooking fuels, the CTCN's support helped anchor the intervention within a broader systems perspective, linking waste management, energy access, and agricultural productivity rather than treating the biogas as a standalone technology. - Against a backdrop of security-related access constraints and instability as well as logistical constraints, the CTCN demonstrated essential flexibility in delivery, allowing adjustments to implementation modalities, timelines, and technology pathways without compromising the project's development objectives. This flexibility was particularly important in maintaining momentum and ensuring

	<i>continuity of engagement when in-person activities, international travel, and equipment transport were not feasible.</i> <i>CTCN assistance also played a key role in sustaining community and stakeholder engagement in a rural setting where socio-economic pressures and competing daily priorities limited consistent participation. Through the direct sourcing and hire of a highly competent local consultant and regular coordination with CCREEE and the National Designated Entity (NDE), the TA maintained institutional alignment and community trust, even as activities were rephased. Continuous engagement with the NDE and facilitation of coordination with national counterparts strengthened legitimacy and coherence with national climate and energy priorities.</i> <i>To address risks related to technical capacity and long-term operability—particularly the potential deficiencies associated with inflatable biodigesters in environments with limited repair services, the CTCN facilitated the hire of a local on the ground consultant. This included the strategic pivot to a locally constructed biodigester solution better suited to Haiti’s operational realities, thereby enhancing sustainability and scalability.</i> <i>Finally, the CTCN’s role in knowledge sharing, visibility, and thought leadership was instrumental in positioning the project as a credible and adaptable climate technology intervention. Active communication, documentation of lessons learned, and emphasis on replicable approaches strengthened the project’s profile and created a foundation for mobilising</i>
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	<i>additional financial and institutional support beyond the initial TA period. Collectively, these contributions underscore the CTCN's value not only as a provider of technical assistance, but as a strategic enabler of climate technology deployment in fragile and high-risk contexts.</i>
Anticipated impact	<i>The project's overarching objective remains the promotion of sustainable development, climate resilience, and environmental stewardship in a fragile and security-challenged context in Haiti. In response to prevailing security, logistics, and mobility constraints, the project has transitioned from the originally envisaged imported inflatable biodigester to a locally designed and constructed semi-industrial reinforced concrete (dome-type) biodigester, delivered by Cosmos Solution Haiti. This adaptive shift enables the project to advance its development objectives while remaining grounded in Haiti's current operational realities.</i> <i>The selected 10 m³ dome-type biodigester, capable of processing approximately 150–170 kg of organic waste per day, will produce biogas for clean cooking and liquid organic fertiliser for agricultural use. The feasibility of local procurement, construction, transport, on-site installation, and hands-on community training, at an estimated cost of USD 36,873.15, significantly reduces exposure to import dependency, transport insecurity, and international travel risks. Importantly, this revised approach remains fully aligned with the project's core objectives and continues to contribute directly to CTCN Core Impact Indicator 2, namely increased economic, health, environmental, and ecosystem resilience as a result of technical assistance. Resilience of Vulnerable Economic Sectors. The locally delivered biodigester strengthens economic resilience by supporting livelihood diversification and local value creation. Construction, installation, and maintenance activities directly engage the Haitian private sector, reinforcing domestic technical capacity and creating opportunities for local employment and entrepreneurship. The production and use of biogas and organic fertiliser enable households and farmers to</i>

reduce dependence on climate-sensitive and externally supplied inputs, contributing to more stable and resilient income pathways.

Resilience of Food Systems and Food Security.

The generation and application of liquid organic fertiliser is expected to improve soil health, enhance crop productivity, and support climate-smart agricultural practices in Kenscoff. Access to reliable clean energy for cooking and small-scale food processing can reduce post-harvest losses and improve household food security. By lowering reliance on imported or chemically intensive fertilisers, the project promotes more affordable and environmentally sustainable farming systems suited to local conditions.

Public Health and Well-Being Benefits.

The use of biogas for cooking will reduce reliance on firewood and charcoal, leading to lower indoor air pollution and improved respiratory health outcomes, particularly for women and children. These benefits are reinforced through hands-on training on safe system operation and use, contributing to sustained behavioural change at household and community levels.

Educational and Capacity-Building Benefits.

Implementation in Q1 2026 will include community-based training on biodigester operation, maintenance, and waste-to-energy practices, ensuring practical skills transfer and long-term operability of the system. By anchoring training locally and pairing it with real-time installation, the project strengthens community ownership and technical self-sufficiency, reducing reliance on external expertise over time.

Environmental Resilience.

The revised pilot contributes to environmental protection by reducing pressure on forest resources through decreased demand for firewood and charcoal, thereby supporting efforts to address deforestation and soil erosion. Improved organic waste management through conversion of agricultural and household waste into biogas and fertiliser supports circular economy principles and reduces environmental contamination in the community.

Although the technical assistance formally closed on 30 October 2025, the agreed Q1

	2026 implementation ensures that the community of Fessard, Kenscoff will benefit from a fully operational biodigester and associated skills transfer. CCREEE's post-closure support, including monthly remote monitoring, technical check-ins, and advisory engagement, will safeguard quality, accountability, and learning. Regular reporting by Agri-Climato All and continued local communication and outreach will maintain visibility, stakeholder engagement, and alignment with the broader objectives of the EU/CTCN Climate Change and Security Programme, while generating practical lessons for future replication and scale-up in Haiti and other fragile contexts
Co-benefits: Achieved or anticipated co-benefits from the TA	Economic and Social Empowerment: - Facilitates rural community access to financing and economic opportunities in clean energy - Reduces social disparities in economic participation empowering marginalized groups and promoting economic autonomy.. - Enhances food security through improved access to reliable energy for agriculture and food processing. - Strengthens community resilience to climate change impacts, particularly for marginalized groups - Improves energy affordability by replacing firewood with biogas, reducing household expenditures on traditional fuels and alleviating financial strain, particularly for low-income families.
Gender aspects of the TA	The project will - Reduce women's workload through access to clean energy, freeing time for other activities. - Reduce women's exposure to respiratory diseases caused by smoke from traditional cooking fuels - Empowers women economically by enhancing their participation in economic and climate responses.

	Ensures gender-specific needs are considered in project implementation
Anticipated contribution to NDC	Contribution to NDC Goals: - Promotes adoption of sustainable energy solutions, particularly biogas systems, in rural areas. - Aligns with Haiti's efforts to achieve NDC targets by enhancing energy access and resilience in rural communities. - Supports Haiti by building local community capacity to manage climate-related challenges. - Promotes sustainable development practices that reduce vulnerability and enhance resilience.
The narrative story	Implemented by the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE), this initiative reflects CCREEE's CARICOM mandate to advance renewable energy, energy efficiency, and technology transfer in support of a climate-resilient energy sector. Through close collaboration with local partners and institutions, the project places community ownership, inclusivity, and sustainability at its core, with a deliberate focus on engaging women and youth through practical training and skills development. Responding to operational realities in Haiti, the project has transitioned from an imported inflatable biodigester to a locally designed and constructed dome-type biodigester, delivered by a Haitian private-sector provider. This shift enables implementation under current security and logistics constraints while preserving the project's original intent. The system will convert organic waste into biogas for clean cooking and bio-slurry for use as organic fertiliser, directly replacing firewood and charcoal in the community of Fessard, Kenscoff. This transition is expected to reduce deforestation, lower indoor air pollution, and improve household energy access,

	<i>while strengthening local agricultural productivity through improved soil health. Beyond infrastructure, the project prioritises hands-on community training, long-term system operability, and renewable energy entrepreneurship, creating pathways for local livelihoods and resilience. In doing so, it demonstrates a practical, locally grounded model for sustainable rural development and climate action in Haiti.</i>
Contribution to SDGs A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	<i>Project Contribution to Sustainable Development Goals (SDGs)</i> <i>SDG 1: No Poverty: By providing affordable energy solutions to a rural community, the program helps reduce poverty by enabling households to save on energy costs and creating additional economic opportunities through access to reliable energy.</i> <i>SDG 5: Gender Equality: The program integrates gender perspectives by encouraging women's participation in bioenergy projects, thereby enhancing their economic autonomy and leadership. The biogas produced could be used in gas cookers thereby benefiting women who are often the ones who have to do the cooking which is now primarily being done on wood fires.</i> <i>SDG 7: Affordable and Clean Energy</i> <i>7.1 – By promoting the use of biodigester technology in rural Haiti, the Hatiti Biodigester Project aims to ensure access for all to reliable, modern, and affordable energy services, bridging the electricity access gap between urban and rural areas.</i> <i>7.3 – The CCREEE enhances education, awareness, and institutional capacity related to climate change mitigation and adaptation by deploying sustainable energy solutions and training local community members. The program strengthens local capacities to mitigate climate impacts and supports sustainable development.</i> <i>SDG 13: Climate Action</i> <i>13.1 – The TA enhances resilience and adaptation to climate risks and disasters.</i>

	<i>13.3 – The T.A improves education, awareness, and institutional capacities related to climate change mitigation and adaptation. By training local technicians, raising community awareness, and strengthening institutional capacities, the program contributes to sustainable development and climate resilience.</i> <i>13.a – By promoting partnerships and facilitating access to climate finance, the TA supports significant mitigation actions in developing countries</i> <i>13.b – The program promotes mechanisms to enhance effective planning and management capacities related to climate change, focusing on women, youth, and marginalized communities in least developed countries and Small Island Developing States.</i>
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Annex 1 Technical assistance data collection

Please add quantitative and qualitative values for the indicators selected in the M&E plan and monitored throughout the technical assistance in the tables below. Indicators which have been monitored in addition to the proposed indicators below may be added at the end of table A. Non-relevant indicators should be left blank.

A. Output and outcome indicators

Indicator	Quantitative value Numerals only; disaggregates must sum to the total	Qualitative description List the various elements corresponding to the quantitative value as well as timelines and responsible institutions
<i>Please note indicators below highlighted as anticipated</i>		
<i>Total number of events organized by proponents and implementing partners</i>	6	1 - System architecture and business model presentation workshop 2 –a t least 2 training workshops conducted to initiate and disseminate new technologies 1 - Demonstration workshop at the commune of Fessard 2 – at least 2 continuous training workshops conducted
<i>Number of participants in events organized by proponents and implementing partners</i>	30	At least 30 participants ensuring a minimum representation of 30% women and 20% from the pilot community
a) <i>Number of men</i>	21	
b) <i>Number of women</i>	9	30% women of what ever number attends
<i>Number of climate technology RD&D related events</i>	6	1 - System architecture and business model presentation workshop 2 –a t least 2 training workshops conducted to initiate and disseminate new technologies 1 - Demonstration workshop at the commune of Fessard 2 – at least 2 continuous training workshops conducted
<i>Number of participants in climate technology RD&D events</i>	30	At least 30 participants ensuring a minimum representation of 30% women and 20% from the pilot community

a) Number of men	21	
b) Number of women	9	At least 30% women target
Number of training organized by proponents and implementing partners	4	2 –at least 2 training workshops conducted to initiate and disseminate new technologies 2 – at least 2 continuous training workshops conducted
Number of participants in trainings organized by proponents and implementing partners	30	3
a) Number of men	21	
b) Number of women	9	At least 30% women target
Total number of institutions trained	1	3
a) Governmental (national or subnational)	0	List the name of organisations trained here
b) Private sector (bank, corporation, etc.)	0	List the name of organisations trained here
c) Nongovernmental (NGO, University, etc.)	1	Community based organisations – Agroclimatico All
Percentage of participants reporting satisfaction with CTCN training (from CTCN training feedback form)	TBC	Satisfied= 4+ on 5-pt scale
Percentage of participants reporting increased knowledge, capacity and/or understanding as a result of CTCN training (from CTCN training feedback form)	TBC	Increased knowledge, capacity and/or understanding= 4+ on 5-pt scale
a) Percentage of men	TBC	
b) Percentage of women	TBC	
Total number of deliverables produced during the assistance (excluding mission, progress and internal reports)	8	
a) Number of communication materials, including news releases, newsletters, articles, presentations, social media postings, etc.	1	Communications Strategy document
b) Number of tools and technical documents strengthened, revised or developed	5	1. Report on Needs assessment and definition of specifications for inflatable biodigesters 2. Diagnosis of the technologies used by the commune of Kenscoff in its agricultural production. 3. Definition of the community's needs in terms of biogas production 4. Definition of biodigester system architecture 5. Analysis of existing biodigester technologies available in Haiti or in the region

		6. Meeting report with photos, presentations used and list of participants by gender/youth and vulnerable population
c) Number of other information materials strengthened, revised or created (For example training and workshop reports, Power Points, exercise docs etc.)	6	1. Report on Needs assessment and definition of specifications for inflatable biodigesters 2. Diagnosis of the technologies used by the commune of Kenscoff in its agricultural production. 3. Definition of the community's needs in terms of biogas production 4. Definition of biodigester system architecture 5. Analysis of existing biodigester technologies available in Haiti or in the region 6. Communications strategy
Total number of policies, strategies, plans, laws, agreements or regulations supported by the assistance	0	0
a) Adaptation related	0	List the type and name of documents supported
b) Mitigation related	0	List the type and name of documents supported
c) Both adaptation- and mitigation related	0	List the type and name of documents supported
Anticipated number of policies, strategies, plans, laws, agreements or regulations proposed, adopted or implemented as a result of the TA	List total number here	0
a) Adaptation related	0	List the type of documents anticipated to be proposed, adopted or implemented
b) Mitigation related	0	List the type of documents anticipated to be proposed, adopted or implemented
c) Both adaptation- and mitigation related	0	List the type of documents anticipated to be proposed, adopted or implemented
Anticipated number of technologies transferred or deployed as a result of CTCN support	1	<u>Instruction:</u> List the type of technologies supported by this assistance. Technologies must be identified from the CTCN taxonomy of climate sectors and technologies (download in pdf format and choose from column C):

		https://www.ctcn.org/resources/ctcn-taxonomy A locally delivered solution provided by Cosmos Solution Haiti, based on a semi-industrial reinforced concrete (dome-type) biodigester designed and constructed in Haiti. The selected system comprises a 10 m ³ digester capable of processing approximately 150–170 kg of organic waste per day, producing both biogas for cooking and liquid organic fertilizer, and includes on-site installation and hands-on community training.
Anticipated number of collaborations facilitated or enabled as a result of technical assistance	List total number here	2
a) Number of South-South collaborations	NA	NA
b) Number of RD&D collaborations	1	A locally delivered solution provided by Cosmos Solution Haiti, based on a semi-industrial reinforced concrete (dome-type) biodigester designed and constructed in Haiti. The selected system comprises a 10 m ³ digester capable of processing approximately 150–170 kg of organic waste per day, producing both biogas for cooking and liquid organic fertilizer, and includes on-site installation and hands-on community training.
c) Number of private sector collaborations	2	Collaboration with AVISE for feedstock and with COSMOS for the replacement indigenous biodigester technology
Number of countries with strengthened National System of Innovation as a result of CTCN support		List names of countries 1 – Haiti
Insert any additional indicators here		

B. Core impact indicators

Please fill in the tables for anticipated impacts of the CTCN assistance. Every technical assistance should contribute to at least one of the indicators below. For guidance on how to report on core indicators see the '[M&E Guidance Document for TA Implementers](#)'.

Core indicator 1	Anticipated metric tons of CO ₂ equivalent (CO ₂ e) emissions reduced or avoided as a result of CTCN TA
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	<i>Please add your calculations in word or excel format as an Annex to this Closure Report, where applicable.</i>	
	Anticipated metric tons of CO ₂ e reduced or avoided as a result of the TA on annual basis	Anticipated metric tons of CO ₂ e reduced or avoided as a result of the TA in total
Quantitative value (emissions reductions)	NA	NA
Unit	NA	NA
GHG assessment boundary (project emissions) Identify expected post-TA activities, associated effects and assess boundary for quantification of GHG emission reductions		NA
Baseline emissions Describe baseline scenario, baseline candidates, emission factors and emissions calculated	NA	NA
Methodology Explain the method or process of verifying the indicator and how data was gathered	NA	NA
Assumptions Describe assumptions made during calculation and quantification of GHG reductions	NA	NA

Core indicator 2	Anticipated increased economic, health, well-being, infrastructure and built environment, and ecosystems resilience to climate change impacts as a result of technical assistance <i>Please provide a qualitative description of the anticipated impacts on the categories below</i>
Infrastructure and built environment Anticipated increased infrastructure resilience (avoided/mitigated climate induced damages and strengthened physical assets)	<i>The project is expected to increase infrastructure resilience by introducing a durable, locally constructed biogas system designed to operate under Haiti's climatic and security conditions. By relying on locally available materials and skills, the intervention strengthens physical assets that are less exposed to import disruptions and climate-related damage. Improved waste management infrastructure reduces environmental degradation around households and farms, while decentralised energy production</i>

	<i>enhances energy reliability in a context where centralised systems are weak or absent.</i>
Ecosystems and biodiversity Anticipated increased ecosystem resilience (areas with increased resistance to climate-induced disturbances and with improved recovery rates)	<i>By replacing firewood and charcoal with biogas for cooking, the project contributes to reduced pressure on forest resources, supporting improved ecosystem resilience and recovery. The use of bio-slurry as an organic fertiliser reduces dependence on chemical inputs, improving soil health and limiting runoff and contamination. Collectively, these outcomes strengthen the resilience of local ecosystems to climate-induced disturbances such as erosion, land degradation, and declining soil fertility.</i>
Economic Anticipated increased economic resilience (e.g. less reliance on vulnerable economic sectors or diversification of livelihood)	<i>The project enhances economic resilience by diversifying livelihoods and reducing dependence on climate-vulnerable practices, such as charcoal production and low-input subsistence farming. Local construction, installation, and maintenance of the biodigester support Haitian private-sector participation and skills development. Reduced household expenditure on cooking fuels and fertilisers further improves economic stability, while new opportunities emerge in renewable energy services and sustainable agriculture.</i>
Health and wellbeing Anticipated increased health and wellbeing of target group (e.g. improved basic health, water and food security)	<i>The transition to biogas cooking is anticipated to significantly reduce indoor air pollution, leading to improved respiratory health, particularly for women and children. Improved access to clean energy and organic fertiliser supports food security through better agricultural productivity and safer food preparation. Reduced time spent collecting firewood also lowers physical risk and frees time for education and income-generating activities, contributing to overall wellbeing and social resilience.</i>

Core indicator 3	Anticipated number of direct and indirect beneficiaries as a result of the TA	
	Quantitative value	Means of verification
Total beneficiaries	<i>Total number</i>	
Number of adaptation beneficiaries	320–400	Post pilot implementation survey
Number of mitigation beneficiaries	320–400	Post pilot implementation survey
Number of adaptation-and mitigation beneficiaries	320–400	Post pilot implementation survey

Methodology for Estimating Project Beneficiaries

The estimation of beneficiaries for this project is based on a bottom-up, evidence-based calculation approach, drawing directly from the community diagnostic survey and demographic data collected in Fessard, Commune of Pétion-Ville

The approach combines household-level data, community participation rates, and functional reach of the biodigester system to estimate both direct and indirect beneficiaries in a transparent and conservative manner.

Baseline population data indicate that Fessard comprises approximately 4,812 inhabitants across 1,205 households, based on the latest estimates from the Haitian Institute of Statistics and Informatics (IHSI), as cited in the diagnostic report. Due to security constraints, a representative sample of approximately 60 farming households was surveyed using structured questionnaires and interviews, providing statistically indicative data on waste generation, energy use, willingness to participate, and interest in biogas and organic fertiliser use.

From the diagnostic, surveyed households produce an average of 9.7 kg of usable organic waste per household per week, equivalent to approximately 1,000 kg of organic substrate per week for a cluster of 100 households. This waste availability aligns with the operational capacity of the selected 10 m³ biodigester, which is designed to process 150–170 kg of organic waste per day. Based on this capacity, the biodigester is expected to directly serve approximately 80–100 households, assuming shared (collective) use an option strongly preferred by the community according to survey results.

Direct beneficiaries are therefore calculated as:

- 80–100 households × average household size (≈ 4 persons)
- Resulting in approximately 320–400 direct beneficiaries, with women and youth representing a substantial share, given their central role in cooking, waste management, and agriculture identified in the diagnostic.

In addition, secondary (indirect) beneficiaries are identified through:

- Use of liquid organic fertiliser (bio-slurry) by non-participating farmers,
- Community-wide environmental and health benefits from reduced deforestation and air pollution,
- Skills transfer through training activities (60 trainees per cycle) and local dissemination,
- Demonstration effects encouraging replication.

Applying conservative CTCN practice, indirect beneficiaries are estimated at 2–3 times the number of direct beneficiaries, resulting in an additional 800–1,200 indirect beneficiaries within the wider Fessard community.

This calculation approach ensures that beneficiary estimates are anchored in measured waste availability, realistic system capacity, and demonstrated community engagement, while accounting for contextual constraints and phased implementation. It also provides a scalable framework that can be refined as operational data become available during Q1 2026 implementation and post-closure monitoring.

Core indicator 4	Anticipated amount of funding/investment leveraged (USD) as a result of TA (disaggregated by public, private, national, and international sources, as well as between anticipated/confirmed funding)			
	Quantitative value confirmed in USD	Quantitative value anticipated in USD	Qualitative description List the institutions, timelines, and description or title of the investment	Methods Describe methods used for quantification of funds leveraged
Total funding	Total number in USD (numerals only, no rounding or abbreviations)	Total number in USD (numerals only, no rounding or abbreviations)	N/A	N/A
Anticipated amount of public funding			N/A	N/A

mobilised from national/domestic sources				
Anticipated amount of public funding mobilised from international/ regional sources			N/A	N/A
Anticipated amount of private funding mobilised from national/domestic sources			N/A	N/A
Anticipated amount of private funds mobilised from international/regional sources			N/A	N/A

Outputs and Activities

Outputs	Output Indicators	Means of Verification	Key Assumptions
Output 1 – Development of Response Plan, implementation planning and communication documents	Set of planning documents submitted to set the project baseline and establish a reference for project evaluation - Development of detailed Response Plan - Development of implementation plan of all activities, deliverables, outputs, deadlines, and responsible persons/ organizations, including a detailed budget - Development of the monitoring and evaluation plan for the implementation of assistance - Description of Expected Impacts - Preparation of the closing and data collection report	• Approved Response plan, implementation plan and M&E documents • Steering committee minutes	• Stakeholders actively engaged
Output 2 – Needs assessment and definition of specifications for inflatable biodigesters.	- Creation of a restricted working group and organization of technical assistance kick-off meeting. - Diagnosis of the technologies used by the commune of Kenscoff in its agricultural production - Definition of the community's needs in terms of biogas production - Defining the impact the biodigester could have on the community. - Minutes of the validation workshop	• Diagnostic reports • Biodigester Design document	• Effective collaboration the NGO and the community of Fessnard

Output 3 – Definition of biodigester system architecture	- Analysis of existing biodigester technologies available in Haiti or in the region - Cost study of the technologies identified in the previous activity. - Meeting report with photos, presentations used and list of participants by gender/youth and vulnerable population. - Complete architecture of the biodigester system adapted to the needs of the pilot commune, and presentation of a financing model - System architecture and business model presentation workshop - Signing of a letter of commitment by the Ministry of the Environment and the representative of the commune of Fessard	• Analysis existing biodigester report • Biodigester design document • Community workshops conducted	• Stakeholders actively engaged
Output 4 – Biodigester system control and liquid fertilizer generation.	- Deployment of selected technology in the commune of Fessard - Demonstration workshop at the commune of Fessard - Organization of continuous training workshops - Review of project impact	• Asset registers • Usage logs • Workshop agenda and minutes • Photos, videos, reports, and interviews with community users • Training materials	• Biodigester procured, installed and workshops conducted
Output 5 –Communicating and creating an environment conducive to the deployment of biodigester technology on a larger scale.	- Definition and deployment of communications strategy - Roadmap for the development of a private sector for the production and marketing of biodigesters in Haiti	• M&E reports • Communications strategy • Communications collatorals & materials • Workshop report • Road map for private sector integration document	• Stakeholders engaged • Interest private sector

Annex 2 (for internal use – to be filled in by the CTCN)

CTCN evaluation

This section will be completed by the relevant CTCN Technology Manager.

- Evaluation of the timeliness of the TA implementation as measured against the timeline included in the response plan;
- Evaluation of TA quality as defined in the response plan;
- Overall performance of the Implementers;
- Overall engagement of the NDE and Proponent;
- Lessons learned on the CTCN process and steps taken by the CTCN to improve.