PART 1: Description and all information of the outcome/impact reported

TITLE

Empowering Ghanaian communities to conserve their forests through a private-sector-led Payment for Ecosystem Services mechanism.

YEAR

2024

OUTCOME IMPACT CASE REPORT

Study #AFR - 2414

Stage of Maturity of change reported: stage 2

GEOGRAPHIC SCOPE: SUB-NATIONAL

COUNTRY: Tano Offin Forest Reserve, Ghana

Contributing external partners:

- Mondelez International
- Beyond Chocolate
- Forestry Commission, Ghana
- Tropenbos, Ghana
- Sustainable Food Lab
- Olam Food Ingredients

OUTCOME STORY/IMPACT STATEMENT

The Landscapes for Cocoa Livelihoods project reduced deforestation by 71% over 1,044 hectares in Ghana's Tano Offin Forest Reserve, conserving 6,911 tons of CO2 equivalent, 65,303 m^3 of water recharge, and 39 hectares of biodiverse landscape over a period of 1 year (July 1st 2023 – June 30th 2024). This project demonstrates the scaling potential of a private-sector-funded Payment for Ecosystem Services (PES) model, where cacao-producing communities conserve the forest in exchange for collective rewards that improve every household's living conditions.

CGIAR INNOVATION(S) OR FINDINGS THAT HAVE RESULTED IN THIS OUTCOME OR IMPACT

The Alliance's cutting-edge Terra-i remote-sensing system provides near real-time forest monitoring, which is central to the project's success. Using data from Sentinel 1 and Sentinel 2 Copernicus satellites, Terra-i provides timely and accurate information about forest changes and detects deforestation and forest degradation fortnightly. By analyzing satellite imagery, Terra-i supports proactive monitoring and early response to illegal logging and farming, playing a crucial role in sustainable forest management. [1,2]

Its cost-effectiveness stems from utilizing freely available satellite data and automated machine learning algorithms, enabling scalable monitoring across large areas. Indeed, the system relies on Sentinel 1 and Sentinel 2 Copernicus satellite data, which are freely accessible and therefore it eliminates the need for expensive data acquisition, and it allows the scalability of the model in various regions across the globe. [1,2]

A participatory approach was developed to make Terra-i data accessible to local communities in formats suited to their skills and knowledge. Equipped with timely and accurate information about forest changes, these communities actively participate in forest conservation efforts and collaborate with the Ghana Forestry Commission to implement targeted monitoring interventions. [3,4] Integrating Terra-i data into community-based forest management initiatives enhances the effectiveness of these initiatives and strengthens the bond between local communities and their natural surroundings. By involving and empowering the people most affected by forest changes, Terra-i fosters ownership, effective stewardship, and collective responsibility for conservation. [4]

ELABORATION OF OUTCOME/IMPACT STATEMENT

The combination of Terra-i remote sensing technology, community participatory design, and public-private stakeholder engagements has provided a scalable, cost-effective model for forest monitoring and conservation. By leveraging freely accessible satellite data and tapping into local knowledge, this globally replicable approach is now driving Ghanaian community-led forest conservation and sustainable forest management initiatives.

The Payment for Ecosystem Services (PES) mechanism is leveraging collective cash transfer from Mondelez International to empower forest fringe communities to champion forest conservation. The selected intervention area of 1044 hectares within the Tano Offin Forest Reserve represents one of the most intact stretches of this forest, supporting high biodiversity levels. Without intervention, the area was projected to lose 56 hectares annually over 5 years. Results from the community-led conservation initiative include:

- Reduced deforestation: annual deforestation dropped to 16.4 hectares (40.6 acres), a 37% reduction from previous rates (26 hectares/year), and a 71% decrease from the projected business-as-usual scenario (56 ha/year) [3].
- Protected carbon sinks: The reduction in deforestation led to avoided forest carbon losses, with 6,911 tons of carbon dioxide equivalent (CO_2e) conserved [5].
- Recharged water: 65,303 cubic meters of water recharge was conserved per year, which is based on typical water usage. This amount meets the daily water needs of more than 9,000 African households. [5]
- Preserved water quality: 38,894 cubic meters of water quick flow was avoided, which is a reduction of 71% compared to business-as-usual scenario. Reduction in quick flow protects against sedimentation and murky water for household consumption. [5]
- Conserved biodiversity: 39.6 hectares of medium and high biodiversity forest were safeguarded, protecting habitats in an Important Bird and Biodiversity Area (IBA) home to 569 species, including seven globally threatened species. (The biodiversity levels correspond to the higher, middle, and lower value calculated from mean species abundance (MSA) estimates of forest within and adjacent to the project conservation areas.) [5,6,4]
- Empowered communities: the project empowered 423 households from 6 communities and hamlets to champions forest conservation through community governance structure. Twelve young individuals received geospatial training and were mobilized as project volunteers, using a Qfield tablet to check and report on deforestation alerts delivered by Terra-i. [3,4]
- Improved public infrastructure: The communities achieved the third level of reward, corresponding to 2,000 USD, to be used towards the construction of a local health clinic. [3]

GENDER, YOUTH, CAPACITY DEVELOPMENT AND CLIMATE CHANGE

Climate Change relevance: 1 - Significant. Deforestation is a major contributor to climate change. By protecting forests in the Tano Offin Forest Reserve, the project avoids the release of 6,911 tons of CO_2 equivalent, supporting global efforts to combat climate change and promoting sustainable land use practices. [3,4,6]

Capacity Development relevance: 1 - Significant. The project strengthened community governance and fostered collaboration with the Forestry Commission, building long-term capacity for sustainable forest management. [3,4,7]

Youth relevance: 1 - Significant. The project empowered young individuals with geospatial training and technology skills, enabling them to take active roles in forest conservation. [3,4]

Gender relevance: 1 - Significant. Women were a central part of the governance and intervention model design. The selection of the reward (investment in public infrastructure, starting with a health clinic) was support of women constituents [3,8]

Other cross-cutting dimensions: Qualitative research was conducted in the project areas to capture different challenges facing different genders, ethnicities and landownership groups. [8]

L4CL PES team. Community interview and FGD

PART 2: Mapping to Alliance strategy and structure

KEY CONTRIBUTOR AND STRATEGIC OUTCOMES

Lever 5: Digital Inclusion

SECONDARY CONTRIBUTORS

Lever 2: Multifunctional Landscapes
Gender, Youth and Inclusion

SO3: Partner institutions develop digital strategies and national policies to better harness digital approaches to deliver services to marginalized populations.

SDG TARGETS

- **12.6 -** Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

PART 3: One CGIAR Alignment

LINK TO IMPACT AREAS AND GLOBAL TARGETS

Impact Area 4: Climate Adaptation and Mitigation

- Turn agriculture and forest systems into a net sink for carbon by 2050, with emissions from agriculture decreasing by 1 Gt per year by 2030 and reaching a floor of 5 Gt per year by 2050.

Impact Area 5: Environmental Health and Biodiversity

- Stay within planetary and regional environmental boundaries: consumptive water uses in food production of less than 2500 sq. km. per year (with a focus on the most stressed basins), zero net deforestation, nitrogen application of 90 Tg per year (with a redistribution towards low-input farming systems) and increased use efficiency, and phosphorous application of 10 Tg per year.

L4CL PES team. PES launch event

PART 4: Evidence, References and COM material

EVIDENCE AND REFERENCES

1. Reymondin, L; Paz-García, P; Tello, J.J; Coca-Castro, A; Bautista, O; Menzinger, B. (2019). User Manual. Training Manual Terra-i. Version 2. CIAT Publication No. 477. International Center for Tropical Agriculture (CIAT), Cali, Colombia. 114 p. (available here)
2. Tapasco, J.; Reymondin, L.; Paz, PA; Tello, JJ; Perez, JA; Enciso, A.; Phan, TV (2024) Second phase of implementation of the Terra-i system in the Cauca Valley, for near-real-time monitoring of changes in vegetation cover. 12 p. (available here)
3. L4CL PES Year 1 project summary (internal document - available upon request)
4. Info brief: Payment for Ecosystem Services facilitated by Terra-i (internal document - available upon request)
5. Deforestation reduction impact on carbon, water and biodiversity calculation (internal document - available upon request)
6. L4CL project impact dashboard (available here)
7. MOU between CIAT and Ghana Forestry Commission (internal document - available upon request)
8. Nguyen-Perperidis E.; Adomaa F.O; Nguyen P.M; Kyeretwie B.N.S. (2023) Advancing a Gender-Responsive Delivery Model for Mitigating Climate Impacts in Ghana's Cocoa Landscape. FARA Research Report Vol 7(19):196-213. (available here)

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The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) delivers research-based solutions that harness agricultural biodiversity and sustainably transform food systems to improve people's lives. Alliance solutions address the global crises of malnutrition, climate change, biodiversity loss, and environmental degradation.

The Alliance is part of CGIAR, a global research partnership for a food-secure future.

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