Restoring Landscapes through Resilient Water Smart Coffee Systems (2022-2024)

COST -EFFICIENCY ANALYSIS, HONDURAS & NICARAGUA, OCTOBER 2024

Summary

Catholic Relief Services (CRS) analysed the cost-efficiency of the Blue Harvest model which incorporated water-smart approaches resulting in a unique set of simple, proven practices, tools and methods that are tailored for resilient coffee production in rural Honduras and Nicaragua. The analysis showed the following findings:

- The cost **per farmer trained was $433** which included expenses related to developing necessary competencies, the development of Farmer Field Schools as well as mentoring support to farmers.
- The project spent **$270 per new Ha under water smart agriculture practices.**
- Participatory governance initiatives boosted project achievements. It cost **$47,930 to strengthen the capacity of each organization and $45 per Ha for them to use new protection or conservation measures.**
- **Partnering** with local coffee organizations leads to **improved efficiencies, reaches more farmers** and **leverages scarce resources** to benefit more farmers; **Maximizing this potential can maximize impact.**

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Introduction

In rural Honduras and Nicaragua, smallholder agriculture is the backbone of the economy and has the biggest footprint on the landscape. Coffee farmers depend on landscape health and the ecosystem services provided by soil and water resources to generate a viable livelihood. Since 2014, CRS has worked successfully with coffee farmers to adopt Water Smart Agriculture (WSA) practices[1] that increase production and income while reducing negative environmental impacts and restoring degraded lands. This goal was achieved by two strategic objectives:

- Scaling up the adoption of water smart practices within coffee production systems to increase productivity and resilience through the restoration of soil and water resources; and
- Catalysing multi-sector stakeholder collaboration to scale agricultural landscape restoration and protect critical watershed.

The project to date has demonstrated the economic and ecological benefits of WSA on smallholder coffee farms, and the impact on agricultural landscape restoration[2] when WSA is combined with water resource governance and conservation management of protected areas. CRS on-farm research in Central America over the last four years shows that on average, coffee plots using WSA practices increase both yield and income year over year and help to mitigate the negative effects of coffee market price variability.

Over two years, the project provided personalized technical assistance to 1,899 coffee producers out of whom 2,203 implemented new WSA practices and realised 4,967 new Ha of land under WSA practices such as ground cover, improved coffee plant nutrition, agroforestry, crop diversification, and shade regulation on their farms. The project is successfully expanding WSA practices in the project's target regions through implementation of a technical assistance plan promoting WSA practices at the farm level. The plan's 5-step pathway starts with an initial farm visit, followed by data collection, technical assistance, training, and implementation of field monitoring actions.

The project collaborated with 25 organizations in both countries, thus increasing the scale of landscape action in the intervention areas. Cooperation partners included municipalities, water boards, conservation and protection associations, NGOs and multisectoral platforms. The partnerships focus on concrete actions coordinated with municipal governments to strengthen micro-watershed governance coordination and local organizations to reforest, protect, monitor, and prevent fires. As of June 2024, the projects' participatory governance initiatives placed 28,555 hectares under new protection or conservation measures. Cumulatively, organizations contributed $92, 982 of their own resources such as staff time, cash, and equipment to support activities such as building ecological stoves, distributing seedlings, reforestation campaigns, construction of watersheds and support to National Watershed Protection Program.

Analysis Approach and Methodology

Cost-efficiency analysis estimates the ratio of program costs to outputs created, allowing organisations to compare cost-per-output for programs which all produced the same output. In September 2024, CRS conducted cost-efficiency analyses on the Blue Harvest Regenerative project. The process utilized Dioptra tool over four virtual sessions of two-three hours each. An analysis of the various interventions was conducted (Table 1):

TABLE 1: SUB ANALYSIS

Objective	Cost Metric	Output indicator
Scale up the adoption of water smart practices	Cost per farmer	Number of farmers trained on WSA practices Number of coffee farmers applying WSA practices.

[1] Water Smart Agriculture (WSA) includes four core practices: Permanent soil cover, 4R Integrated Soil Fertility Management, Cover cropping, and Diversification through intercropping, rotations, and integration of more trees.

[2] CRS' Working Definition of Agricultural Landscape Restoration: The continual improvement of degraded land and water resources at multiple scales by implementing water-smart agriculture and environmental conservation to restore key ecosystem services and foster economic growth in ways that lead to integral human development.

	Cost per Ha	Total number of new Ha of land under WSA.
Catalyse multi-sector stakeholder collaboration to scale agricultural landscape restoration and protect critical watersheds.	Cost per stakeholder	Number of stakeholders engaged in participatory governance action.
	Cost per Ha	Total of Ha protected through participator action.

Data

The main data needed for the cost-efficiency analysis were the project expenditure and output data. Expenditure data were sourced from CRS Insight finance database (including Direct Project Costs, Direct Shared Costs, and Indirect Costs) for the project implementation period of January 1, 2022- June 30, 2024, from different project donors were merged and utilized for the analysis. Output data were sourced from project reports.

The Dioptra Tool

Dioptra is a web-based cost analysis software that allows program staff in country offices, who are most familiar with day-to-day program implementation, to rapidly estimate the cost-efficiency of their program activities. It guides users through a standardized costing methodology, ensuring that all analysis results are methodologically consistent and can be meaningfully compared across different contexts and organizations.

By using the Dioptra tool, rather than having to learn a complex costing methodology and assemble data manually in spreadsheets, staff can focus on providing crucial estimates of how different resources were used across activities within a program, which are not captured in any current data system. For more information, see www.dioptratool.org/how-does-dioptra-work.

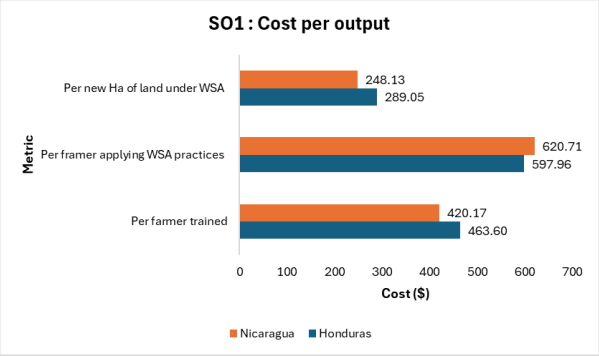
Results

On average**, the cost per farmer trained** was **$433** which included development of necessary competencies, development of Farmer Field Schools as well as mentoring support to scale up WSA and improve coffee quality for producers and buyers; **the cost of achieving farmers' application of WSA practices cost $608 per farmer** and the project spent **$270 per new Ha of land under WSA practices.**

The capacity strengthening of producers took place over 136 field days, using field schools, demonstrations, and technical assistance events.

The costs in the two countries were not significantly different. The costs were as follows.

FIGURE 1: COST PER OUTPUT: SCALE UP THE ADOPTION OF WATER SMART PRACTICES



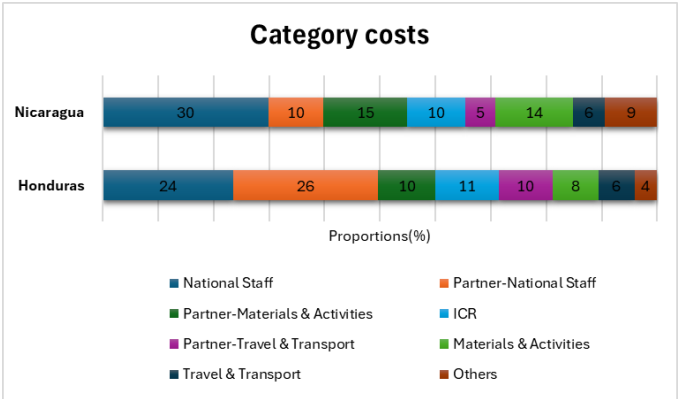
The project trained a total of 3,019 farmers (1,620 in Honduras and 1,399 in Nicaragua). The proportion of farmers applying WSA practices was 73% (77% in Honduras and 68% in Nicaragua). The project used the WSA Trainer of Trainers (ToT) approach to strengthen partner extension teams of the 25 partner organizations, reaching 55 extensionists (12 in Nicaragua and 43 in Honduras). Partner extensionists in turn trained 146 promoter-producers (76 in Nicaragua and 70 in Honduras) in WSA practices for coffee. The Coffee and Community project with Root Capital gained momentum in 2023, permitting BHR to include a greater number of technicians and promoter-producers under the BHR umbrella.

The coffee growers implemented WSA practices such as live and dead ground cover management, agroforestry systems, crop diversification, shade regulation and tissue management. In addition, field technicians and producer promoters have registered and provided direct on-farm technical assistance to all farmers at least once per year.

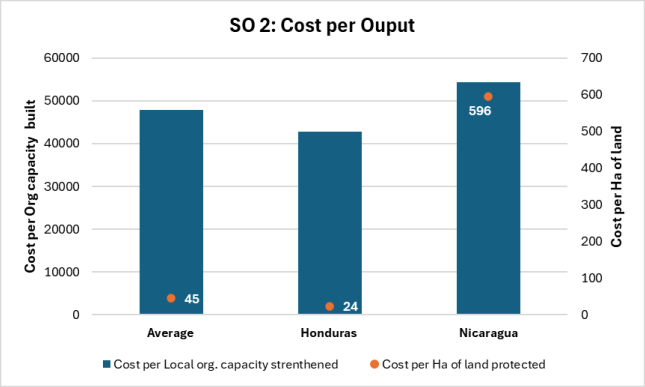
The program partnered with institutions of higher education to develop a training program for BHR field technicians in Honduras and in Nicaragua to offer a Postgraduate Diploma in Extension in Rainfed Agriculture through an 8-module course and certification. To connect coffee farmers with technical assistance and each other, BHR offered 4 digital literacy trainings to 63 technicians, promoters, and extensionists (50 men and 13 women). The trainings taught participants how to use the CRS Virtual WSA platform, basic cell phone messaging and social networks. The Virtual WSA platform is an extension tool that currently offers 7 WSA training modules on WSA practices. In 2023, 67 BHR technicians and promoters accessed Virtual WSA taking between 2 to 7 modules.

One of the innovative ways that reduces cost per output is the inclusion of WSA's radio campaign. BHR program staff participated in three radio programs on "Managing the 4Rs in Coffee Farming," "Farming with Trees," and "STAR Wastewater Treatment Systems in Wet Coffee Processing." The programs were broadcast on three radio stations in each country. This reduced the time the technical team provided onsite support and could be farmers could learn on farm practices at comfort of their farms. ensured use by farmers.

In both countries there was some significant differences in proportional costs spent per category. In Honduras the highest spending category was Partner National staffing (26%) while in Nicaragua it was CRS' national staffing. There were a mix of spending levels when it came to partner spending. Program materials were significantly more spent for Nicaragua: 29% than for Honduras: 18% (Both CRS' and partner combined)



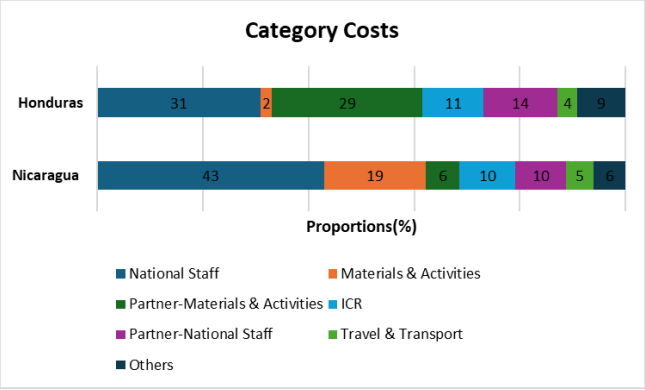
Under **participatory governance initiatives**, on average it **cost $47,930 to build capacity for each** of the 25 local organizations. Cumulatively, the organizations realised a total of **28,555 hectares of land under new protection or conservation measures**, translating to a **cost of $45 per Ha.**



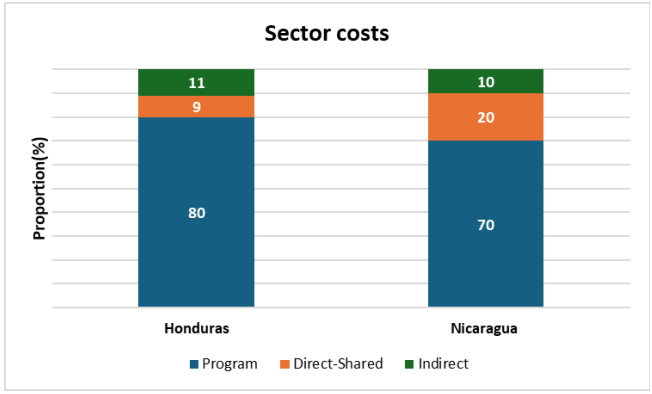
The costs of this initiative were largely driven by **the number of outputs achieved.** In Honduras the cost were modest **($42,865.63 per organization's capacity built and $23.86 per Ha of land protected)** as it realised a larger output **(14 local organizations reached and 27,488 Ha of land protected)** translating to a cost of **$23 per ha.** However, the costs per hectare and per organization are more expensive in Nicaragua (11 organizations and 1,067 Ha of land protected), translating to $54,374.47 per organization and $595.53 per new Ha of land protected. Nicaragua's costs will be lower if more local organizations could access more farmers with more land.

With the cofinancing the participating organizations contributed, the project worked with local partners to develop twenty-two designs for the treatment of wastewater and pulp in the centralized wet mills of an equal number of coffee organizations (18 in Nicaragua and 4 in Honduras).

In both countries, National staff (43% in Nicaragua and 31% in Honduras) and material activities were the major cost drivers (26% in Nicaragua and 31% in Honduras).



In both countries most of the expenses were in program sector (80% in Honduras and 70% in Nicaragua). The least spent categories were direct-shared costs in Honduras (9%) and indirect costs in Nicaragua (10%).



Partnering with local coffee organizations leads to improved efficiencies, reaches more farmers and leverages scarce resources to reach more farmers.

Participatory Governance Initiatives such as local scaling up of WSA practices and landscape restoration by managing collaborative partnerships with prioritized stakeholders and local governments has both wins in acceptability and sustainability of the initiatives.

The project reached more hectares of land under the multisector collaboration component (27,488 Ha of land protected) making the cost/ha quite low ($45 per new ha protected).

In addition to donor co-financing, BHR implementing partners also contribute resources to achieve project results. In Honduras, for example, the project partly funded partners to construct pulp mills, tree nurseries, wastewater treatment systems for coffee washing (honey water), and the construction of ecological stoves. These investments improve the management of coffee pulp to produce organic fertilizer and improve soil productivity and coffee crop nutrition. Local partners also contributed $415,201 to these investments, representing 52% of the total value of $799,842. Similarly, in Nicaragua, BHR co-funded honey water systems, tree nurseries, coffee rehabilitation, agroforestry systems, among others, with partner contributions of $90,125, representing 59% of the total value of $152,732. With a total co-investment of $952,574 during the project period under review, of which 53% ($505,326) was contributed by the partners and 47% ($447,248) by BHR.