Social and Environmental Sustainability Assessment of an Agroindustrial Cooperative in the Semi-arid Region of Bahia

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Abstract: Stakeholder interest drives the incorporation of Environmental, Social, and Governance (ESG) factors into investment analysis, which have been associated with higher returns and lower risks, including during the COVID-19 pandemic. This study aimed to analyze the alignment of Environmental, Social, and Governance (ESG) indicators with the United Nations Sustainable Development Goals (SDGs) across the environmental, social, and governance dimensions, identifying possible gaps related to sustainability. The selected case study was the Canudos Family Farming Agricultural Cooperative (COOPERCUC), located in the Brazilian semi-arid region within the Caatinga biome. The choice of COOPERCUC is justified by its prominent role in family farming in the region, acting as a local development agent, generating income, and preserving both the regional culture and environment. Data collection was carried out through a semi-structured interview with members of the cooperative's board, based on questionnaires developed from the Ethos Institute's Diagnosis for Sustainable and Responsible Businesses (2013). Furthermore, the questionnaire structure was aligned with SDGs 2 (Zero Hunger and Sustainable Agriculture), 3 (Good Health and Well-being), 4 (Quality Education), 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), 13 (Climate Action), 15 (Life on Land), and 17 (Partnerships for the Goals), as established by the UN in 2022. In this way, it can be considered that the cooperative operates with respect for the social, environmental, cultural, and economic pillars within the municipalities and communities where it is present. In the environmental dimension, regarding ESG indicators and the objectives and targets of the SDGs, the institution has developed actions and practices that strengthen these metrics, and the evidence of such initiatives is analyzed in this research.

Keywords: SDGs, ESG, Caatinga, municipalities, cooperative.

1.Introduction

According to Veiga [1], sustainability is a term that establishes a parallel between economics and ecology, referring to the capacity of a system to become resilient by adapting to adversities and benefiting from changes over time.

Bezerra [2], states that, in order to seek solutions for challenges that may compromise the quality of human life in the future, Kofi Annan, former Secretary-General of the United Nations (UN), created the Global Compact in 2000. Its purpose is to encourage CEOs of large financial institutions to adopt Environmental, Social, and Governance (ESG) criteria in accordance with the Principles for Responsible Investment (PRI) and to promote sustainable growth of corporations [3].

Naum [4], suggests that the adoption of the PRI by large financial institutions and asset managers is the primary reason for implementing ESG factors in investment analyses, thereby reducing financial and reputational risks of Socially Responsible Investments (SRI). This can be particularly observed in synergy with the 17 Sustainable Development Goals (SDGs) [3], which provide guiding metrics through which organizations of all sizes and sectors can be evaluated under common parameters to

pursue growth and development objectives [5]. These objectives may apply to private organizations as well as to public or third-sector entities, a fact demonstrated in this study by analyzing a family farming cooperative in the Brazilian semi-arid region within the Caatinga biome [6].

According to Souza et al. [7], development practices in the semi-arid region must consider and value social aspects such as gender equity, a position supported by Santiago (8), who argues that humans should be the focus of public policies in conjunction with social, environmental, and governance aspects. Comparatively, on an international level, organizations guided by the excellence model of the National Quality Foundation [9], seek similar best practices to improve their world-class performance indicators [9], based on an integrative model focused on value creation.

Beyond a Cartesian evaluation, this study aims to assess structuring issues, identify gaps through evidence examination, and propose practical solutions in the case study to contribute immediately to the organization and also to the industrial literature developed in the Brazilian semi-arid region, thereby serving society.

Thus, the general objective of this work was to evaluate the environmental, social, and governance dimensions related to the Sustainable Development Goals (SDGs) and Environmental, Social, and Governance (ESG) metrics, aiming to identify possible sustainability-related gaps in an Agroindustrial Cooperative of the Bahia Semi-arid region.

The specific objectives were defined as follows:

To assess the actions the cooperative develops related to the SDGs and ESG metrics in the social, environmental, and governance dimensions;

To identify if there are gaps associated with ESG metrics and the SDGs that can be incorporated into the cooperative's context;

To propose improvement opportunities related to the identified gaps.

2. Methodology

In terms of the methodology adopted, the following steps were carried out:

Literature and Document Review: the database used for the research was Google Scholar, with the following descriptors: ESG, SDGs, and Family Farming. The inclusion criteria for selecting publications were: relevance of the content to the topic addressed in this study; research articles or literature reviews; and works written in English or Portuguese. In addition, documentary information from the cooperative was collected for the analysis of processes and agro-industrial workflows.

Definition of the Target Audience: the target audience of this study was the Family Farming Agricultural Cooperative of Canudos, Uauá, and Curaçá (COOPERCUC) [10]. The institution was selected due to its regional importance, considering that it works with raw materials derived from agro-extractive activities, whose production respects social, cultural, economic, and environmental dimensions.

Interview: an interview was conducted with approximately 20 guiding questions, developed based on the Sustainable and Responsible Business Diagnosis of Instituto Ethos [11] and on SDGs 02, 03, 04, 06, 07, 11, 12, 13, and 15 [3]. Examples of guiding questions included: "What sustainable management practices are adopted by the cooperative?", "What types of waste are generated and how are they managed?", "Does the cooperative hold origin or sustainability certifications?" and "How do members assess the socio-environmental impacts of their activities?". These questions aimed to identify evidence of alignment with ESG metrics and the SDGs.

Data Processing and Evaluation of Results: a comparative and critical analysis was carried out between ESG metrics and the SDGs, identifying possible gaps related to sustainability, using the agro-industrial cooperative as a case study.

3. Results and Discussion

The Family Farming Agricultural Cooperative of Canudos, Uauá, and Curaçá (COOPERCUC) was founded in 2004 by family farmers from three municipalities in the semi-arid region of Bahia who sought to organize their production and marketing [10]. The institution originated from the union of 44 individuals, including 24 women and 20 men, who were activists in social and labor movements.

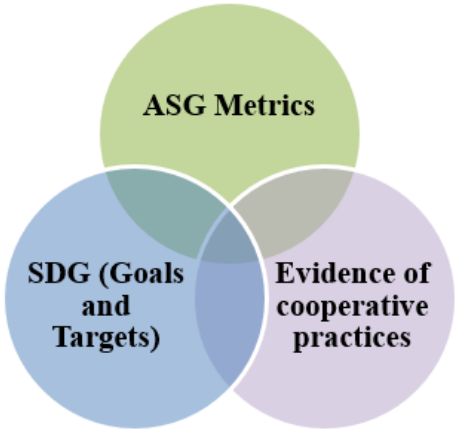
The cooperative primarily works with products derived from the extraction of native plants of the Caatinga biome, specifically umbu and Caatinga passion fruit. To understand the processes and workflows of the analyzed agroindustry, the interview sought elements and evidence of the cooperative's environmental and social practices, as well as opportunities for improvement based on gaps identified in relation to international metrics.

Regarding the agroindustrial process, it can be described that the cooperative collects umbu and other Caatinga fruits directly from nature and reforested areas, which are then sent to the agroindustry facility where they are cleaned and separated by origin, and classified as organic or conventional. Product batches are identified by origin, quality, and type to ensure traceability from raw material sourcing to delivery to the consumer.

With end-to-end traceability of the production chain, the cooperative proceeds with the distribution process in Brazil and Germany. Through mapping the industrial stages via interview, it was possible to identify evidence of the practices under analysis. The production respects social, environmental, cultural, and economic pillars, as observed in the data collected from the interview with the institution's leadership.

The Figure 1. illustrates the method adopted to correlate ESG metrics, SDGs, and the results of the interview with the cooperative's representative, based on information from the environmental and social dimensions, respectively.

Figure 1. Research methods



Source: authors.

Environmental Dimension: ESG metric No. 40 (pollution prevention) correlated with SDG 12 (responsible consumption and production) [3]. The interview revealed that the cooperative meets these sustainability criteria by using filters in the chimneys' air emissions system, retaining part of the gases from wood burning used in fruit cooking. Most other industrial stages use predominantly solar energy. However, the cooperative does not perform greenhouse gas (GHG) accounting or measurement.

ESG metrics No. 40 (pollution prevention) and No. 42 (sustainable water use) correlated with SDG 6 (clean water and sanitation), target 6.4 [3]. The cooperative implements conscious water consumption actions such as rainwater harvesting (four cisterns with 100,000 liters each), drip irrigation, and effluent treatment with reuse for seedling nurseries.

ESG metric No. 38 (climate change adaptation) and SDG 13 (urgent climate action) [3]: initiatives include prohibiting wood extraction and fire in planting areas, restoring degraded areas through nurseries, and adopting the Agrocaatinga system integrating native, fruit-bearing, and agricultural plants.

ESG metric No. 43 (sustainable energy use) and SDG 7 (affordable and clean energy) [1]: majority of energy from solar sources, reducing hydropower dependency and costs. According to Ribeiro et al. [6], the cooperative's initial activities improved community access to electricity and water retention technologies.

ESG metric No. 44 (biodiversity use and habitat restoration) and SDG 11 (sustainable cities and communities) (3): actions include cultural and natural heritage preservation, such as the annual Umbu Festival.

ESG metric No. 32 (impact of products/services) and SDG 12 (responsible consumption and production), target 12.2 [3]: certifications include Ecocert organic certification, participatory certification, family farming seal, and rural technical assistance (ATER) system.

ESG metric No. 40 (pollution prevention) and SDG 6 (water sustainability) (3): packaging changes from plastic to glass; reuse of jars; agroindustrial waste converted into compost or animal feed.

Social Dimension: ESG metrics No. 23 (diversity and equity) and No. 34 (community impact management) with SDG 2 (zero hunger), targets 2.3 and 2.4 [3]: improvements in income, education, and infrastructure; 238 members; 36 direct jobs; school meal supply through PAA and PNAE; organic products and Agrocaatinga adoption; preservation of umbu trees.

ESG metric No. 29 (employee health and safety) and SDG 3 (good health and well-being), target 3.9 (3): promotion of healthy eating via organic products.

ESG metrics No. 35 (community development), No. 36 (supplier development), and No. 45 (education and environmental awareness) with SDG 4 (quality education) (3): annual training, awareness campaigns, and "Host School" project.

Governance Dimension: ESG metric No. 05 (organizational governance) and SDG 17 (global partnerships), target 17.1 (3): cooperation with government bodies for socio-environmental project funding.

ESG metric No. 15 (participatory management) and SDG 17, targets 17.15 and 17.17 (3): active member participation in management.

ESG metric No. 05 (organizational governance) and SDG 17, target 17.10 (3): traceability controls for certifications, audited internally and externally.

ESG metric No. 10 (socially responsible communication) and SDG 17, target 17.17 (3): performance reports presented to members and stakeholders.

4. Conclusions

The COOPERCUC cooperative demonstrates strong alignment between ESG metrics and the SDGs, particularly in the environmental and social dimensions. It showcases effective practices such as the adoption of renewable energy, international certifications, community empowerment, and cultural preservation. However, significant gaps remain in governance and climate management, particularly the absence of GHG monitoring related to carbon credit projects and the lack of sustainability reporting. Below are some highlights:

Environmental Dimension: The cooperative consumes energy for certain industrial processes, predominantly using solar energy, and controls emissions from chimneys resulting from wood burning. However, a key bottleneck is the absence of monitoring or governance actions related to reducing greenhouse gas (GHG) emissions. The cooperative does not prepare an inventory of its atmospheric emissions and lacks indicators related to GHG generation (ESG 37 and SDG 13).

Regarding climate risks, the cooperative contributes through community actions to combat drought, deforestation, and related issues, implementing important resilience and GHG reduction measures.

The cooperative is not engaged in carbon credit projects (ESG 37 and SDG 13), which represents another gap, although it seeks to cultivate in areas undergoing desertification.

Sustainable tourism practices (SDG 12) have not yet been adopted, despite demonstrated interest.

Social Dimension: the cooperative runs the "Escola Anfitriã" (Host School) project, which supports youth training. However, there is still a gap in involving children in environmental awareness activities (ESG 45).

Governance Dimension: no actions were identified related to ESG metric no. 39, environmental management systems, such as the use of monitoring indicators, the establishment of environmental targets, or the preparation of a sustainability report.

Suggestions for Improvement in the Cooperative's Sustainability Actions: conduct an inventory of greenhouse gas (GHG) emissions and create indicators for this purpose, strengthening governance in relation to climate change.

Assess the relevance of engaging in carbon credit projects.

Evaluate the feasibility of implementing a sustainable tourism project, considering the cooperative's potential in this area.

Develop monitoring indicators, establish targets for environmental aspects, and prepare a sustainability report.

Create a project to involve local children in environmental awareness activities.

Addressing these weaknesses through targeted actions could significantly strengthen the cooperative's sustainability performance, in addition to expanding its influence as a reference for other family farming cooperatives in the Brazilian semiarid region.

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