

AN ANALYSIS OF NATURAL CAPITAL ASSESSMENTS OF THE PILOT APPLICATIONS WITHIN THE TEEBAGRIFOOD FOR BUSINESS PROJECT

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Purpose of the article: This study analyzes the natural capital assessments of pilot applications conducted within the TEEB AgriFood for Business Project (2020–2023), implemented by the Capitals Coalition to help agrifood companies integrate natural, social, and human capitals into decision-making processes.

Methodology: The analysis was based on project reports and the Capitals Coalition's four-stage frameworkFrame, Scope, Measure & Value, and Apply-which guided pilot organizations in identifying key risks, dependencies, and opportunities related to natural capital.

Conclusions: Pilot organizations assessed elements such as water use, greenhouse gas emissions, soil health, resource efficiency, and ecosystem condition. Key outcomes included Arvind's 49% reduction in ecosystem harm, Olam Agri's decreases in methane emissions and water use, Go4Fresh's 10% food loss reduction, and Shengmu Organic Milk's measurable benefits for nature and communities.

Originality: The study underscores the importance of standardized indicators and transparent valuation methods for effectively integrating natural capital assessments into business decision-making.

Keywords: Natural Capital; Sustainability; Agri-Food Sector; Valuation Methods; Environmental Performance.

JEL Classifications: Q13, Q57, Q56

INTRODUCTION

The accelerating degradation of natural ecosystems presents a direct and material threat to global economic stability and prospective growth. Recent analyses estimate that approximately US \$44 trillion of economic value generation, constituting more than half of the world's total gross domestic product, is moderately or highly dependent on nature and its services (United Nations, 2021.). Despite this profound dependency, conventional macroeconomic indicators, such as Gross Domestic Product (GDP), are inadequately designed to account for it. GDP, while a measure of economic activity, fails to capture the environmental sustainability of that activity or its contribution to human wellbeing.

This omission creates a critical oversight in economic planning, whereby the systematic depletion of essential natural assets is not recorded as a corresponding loss in national accounts.

Consequently, there is an urgent imperative for a new analytical framework that renders nature's contributions visible and quantifiable to improve the quality of economic decisionmaking (United Nations, 2021).

This paper examines the application of such a framework through an analysis of the TEEB AgriFood for Business Project. The project was designed to facilitate the integration of multi-capital assessments into corporate decision-making to optimize value creation across natural, social, and human capitals. We analyze the project's pilot applications to extract strategic lessons for businesses in the agrifood sector. The central thesis is that the structured assessment of natural capital is an essential component of modern corporate strategy, enabling firms to build resilience, manage risk, and achieve a sustainable competitive advantage (Capitals Coalition, 2016a; Impact Institute, 2023).

CONCEPTUAL FRAMEWORK

Natural Capital is defined as the global stock of natural resources and systems that underpin life on Earth (United Nations, n.d.). This stock encompasses biotic components, such as forests and fisheries which constitute planetary biodiversity, and abiotic resources, including clean air, fresh water, and fertile soil. The biogeochemical processes that regenerate these resources, such as climate and nutrient cycles, are also integral to natural capital (United Nations, 2021.). From this capital stock, society derives a continuous flow of benefits, termed Ecosystem Services, which support economic activity and human life (United Nations, 2021). In this paradigm, a forest represents the capital asset, while the timber, clean air, and biodiversity it provides are the resultant ecosystem services.

The failure of markets to adequately value public goods derived from natural capital—such as climate regulation or flood control—necessitates an alternative accounting approach (Deep Research Institute, 2021.). As private resource owners typically cannot monetize these public benefits, there is limited economic incentive for their provision. Natural Capital Accounting (NCA) offers a conceptual basis for the systematic valuation and accounting of natural capital to address this market failure (Deep Research Institute, n.d.). The objective of NCA is not the commodification of nature, but rather to make valuations explicit, transparent, and evidence-based, thereby enhancing the accountability of economic decisions.

Assessments can be conducted using two complementary methodologies: monetary and non-monetary valuation. Monetary valuation offers a common metric for comparing environmental and economic impacts. However, cognitive science indicates that financial information can exert a disproportionate influence on decisionmakers, a bias that may lead to the overweighting of monetary data (IFRS Foundation, 2025). Conversely, non-monetary valuation incorporates a broader spectrum of environmental, social, and cultural values through qualitative descriptions, physical metrics, and other indicators (United Nations, n.d.). An integrated approach that utilizes both monetary and non-monetary information is therefore essential for a holistic and robust evaluation, leading to more sound policy and corporate strategy (United Nations, 2021). At the national level, the United Nations System of Environmental Economic Accounting (SEEA) provides the internationally accepted statistical standard for implementing NCA (United Nations, 2021).

METHODOLOGICAL FRAMEWORK

For businesses, a standardized and strategic framework is required to translate the concept of natural capital into managerial practice. The Capitals Coalition's Protocol Framework provides a robust methodology for data driven decision-making (Capitals Coalition, 2016a; Capitals Coalition, 2016b). The Coalition is a multistakeholder platform that includes prominent environmental NGOs (e.g., WWF, IUCN, WRI) and major corporations .

The Protocol Framework is a structured process designed to guide organizations systematically identifying environmental risks and opportunities and integrating these findings into core strategy. It consists of four distinct stages:

1. Frame (Why?): Identify risks and opportunities arising from the business's relationship with various capitals and establish the relevance of an assessment for decisionmaking. (Capitals Coalition,2016).

2. Scope (What?): Define the assessment's objective and conduct a materiality analysis to select the most significant impacts and dependencies for the business and its stakeholders (Capitals Coalition, 2016b).

3. Measure and Value (How?): Employ appropriate methodologies to measure and value the costs and benefits associated with material impacts and dependencies (Capitals Coalition, 2016a; TNFD, 2019).

4. Apply (What Next?): Integrate the findings into corporate strategy and decisionmaking processes (Capitals Coalition, n.d.-b).

This structured approach provides the foundation for converting environmental data into strategic business intelligence (Capitals Coalition, n.d.-a; Capitals Coalition, 2016a).

4. Empirical Analysis

The TEEBAgriFood for Business Project (20202023) utilized the Protocol Framework to support agrifood businesses in conducting capital assessments (Capitals Coalition, n.d.-a; Capitals Coalition, 2016a). Our analysis of these pilot applications focused on identifying common practices, outcomes, and challenges.

4.1. Capital Assessments

Participating organizations assessed natural capital to manage impacts on water, soil, GHG emissions, ecosystems, and resource use (Capitals Coalition,2019). The most assessed elements and their associated metrics are summarized in Table 1 (United Nations, 2021).

Table 1: Commonly Assessed Natural Capital Elements and Key Metrics

Assessed Element	Key Metrics
Water	Quantity, quality, withdrawal volumes, water scarcity risk, shadow water prices
Greenhouse Gases (GHG)	Emissions (tCO ₂ e), Social Cost of Carbon (SCC)
Soil Health	Soil condition changes, % degraded pasture, soil loss, soil carbon storage
Resource Efficiency & Waste	Food loss/waste reduction, materials efficiency
Chemical Inputs	Fertilizer/pesticide use, input costs, runoff/leakage rates
Ecosystem Condition	Indicators of ecosystem quality and degradation linked to business activities

Source:elaborated by the authors.

Key Outcomes of Pilot Program Case Studies

The pilot case studies provide direct evidence of value creation driven by the structured assessment approach (Capitals Coalition,2019).

- Arvind's Better Cotton Initiative (BCI): The assessment quantified a 49% reduction in harm to human health and ecosystem quality compared to conventional cotton cultivation (Capitals Coalition, 2019). This provided a demonstrable positive differential, enhancing brand reputation and stakeholder engagement.

- Olam Agri (India & Thailand): Targeted interventions based on materiality assessments yielded significant outcomes. In India, alternate wetting and drying (AWD) technology led to a 48% reduction in methane emissions and 18% reduction in water withdrawal, generating an estimated USD 800,000 in socioenvironmental value. In Thailand, farmer training produced a USD 3.2M reduction in fertilizer-related natural capital impacts (Capitals Coalition,2019).

- Shengmu Organic Milk & Great Giant Foods: These cases demonstrated the framework's scalability. Shengmu's multicapital accounting quantified benefits to nature and communities valued at CNY 6.94 billion. Great Giant Foods successfully used the assessment to achieve tangible waste reduction and cost savings (Impact Institute, 2023).

- Go4Fresh: This case linked natural capital management directly to core business metrics. Supply chain optimization resulted in a 10.5% reduction in food loss, an 18.7% reduction in production costs, and a 7.5% revenue increase (Capitals Coalition, 2019.-c).

4.3. Challenges and Strategic Lessons

The pilot program also revealed common implementation obstacles. A primary challenge was accessing high quality, large-scale environmental datasets, which often necessitated primary data collection or the use of proxies, potentially reducing assessment precision (Impact Institute, 2023; TNFD, 2022). Also, a lack of standardization in monetary valuation metrics (e.g., shadow water prices, Social Cost of Carbon) created inconsistencies and posed challenges for comparability (IFRS Foundation, 2025). Furthermore, companies faced internal constraints related to corporate governance, technical capacity, and resource allocation (Capitals Coalition, 2016a; Capitals Coalition, 2016b).

4.4. Strategic Recommendations and Policy Implications

Based on the lessons from the pilot cases, several recommendations emerge for businesses in the agrifood sector (Capitals Coalition, 2016a; Capitals Coalition, 2016b).

1. Focus on Materiality: Concentrate on a core set of metrics for the most material impacts (e.g., water, GHGs, soil) to ensure clarity and credibility (IFRS Foundation, 2025).

2. Ensure Methodological Transparency: Utilize consistent monetary valuation measures where possible and transparently document all assumptions to build trust in the results (IFRS Foundation, 2025; TNFD, 2022).

3. Promote Strategic Integration: Integrate NCA into ongoing operations by developing reproducible workflows that directly link natural capital metrics to internal decisionmaking (Impact Institute, 2023).

Last but not least, governments have a critical role from a policy perspective. Governments should establish National Natural Capital Accounts aligned with the UN SEEA standard to create a centralized data source to improve the consistency and credibility of these disclosures (United Nations, 2021). Furthermore, a supportive policy environment is needed to encourage corporate adoption of natural capital accounting and disclosure of nature related risks (TNFD, 2022).

CONCLUSIONS

This study provides a systematic analysis of the natural capital assessments conducted within the TEEBAgriFood for Business Project; a program executed by the Capitals Coalition in 2020-2023. Our analysis focuses specifically on the natural capital assessments undertaken by pilot companies in the agrifood sector. The primary objective is to distill actionable insights and strategic recommendations for corporations seeking to leverage natural capital accounting as a mechanism for enhancing operational resilience and securing a competitive advantage. Analysis of pilot applications of TEEBAgriFood for Business Project suggest a compelling conclusion: the application of natural capital assessment within the agrifood industry emerges as a potent instrument for strategic management, risk mitigation, and sustainable value creation beyond routine environmental reporting. By quantifying impacts and dependencies on natural systems, corporations can unlock operational efficiencies, fortify their market position, and construct more resilient business models (Capitals Coalition, 2016a). The success of implementation hinges on a structured approach, as provided by frameworks like the Capitals Coalition's Protocol, to identify material issues, measure impacts accurately and integrate findings into corporate strategy (Capitals Coalition, 2016b). Ultimately, integrating a sophisticated understanding of natural capital into business operations is no longer a niche activity but a fundamental component of building competitive and sustainable modern enterprises (TNFD, 2019).

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