

From Triple to Quadruple Bottom Line: Embedding *Culture* in Sustainable Development

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Abstract - The widely acclaimed Triple Bottom Line (TBL) framework Economy, Society, and Environment has shaped global sustainability discourse for nearly three decades. However, despite its vast influence, a structural limitation persists: TBL does not explicitly account for Culture, the epistemic, ethical, and community anchoring dimension through which societies interpret sustainability, negotiate values, and organise collective life. A growing body of literature across anthropology, Indigenous studies, and sustainability discourses notes this omission but does not provide a consolidated conceptual model that integrates Culture into mainstream sustainability frameworks. This paper addresses that gap by demonstrating why Culture constitutes the missing analytic and operational foundation within existing sustainability theories and practices. Drawing on peer-reviewed cross-cultural research, structured literature analysis, and qualitative reflections, the paper shows how Culture shapes ethics, decision-making, innovation, community resilience, and intergenerational responsibilities. Indigenous Australian knowledge systems developed through 60,000 years of relational stewardship illustrate how cultural traditions encode sustainability principles that modern governance often sidelines or misinterprets. The paper proposes a Quadruple Bottom Line (QBL) model encompassing Economy, Society, Environment, and Culture as a robust, layered framework. By positioning Culture at the normative centre of sustainability thinking, the QBL framework ensures that progress remains ethical, human-centred, and grounded in place-based knowledge systems, instilling a sense of reassurance and confidence in its applicability.

Keywords: Australia, Culture, Ethics, Governance, Indigenous Knowledge, Quadruple Bottom Line (QBL), Sri Lanka, Sustainability, Triple Bottom Line (TBL)

I. INTRODUCTION

The central aim of this paper is to re-examine the conceptual foundations of sustainability and to argue that its future relevance depends on embedding Culture as the foundation alongside the economic, social, and environmental dimensions. Over the past forty-eight years, sustainability has evolved from an ecological appeal into one of the most frequently invoked concepts across the economic, social, and environmental sciences, as well as professional practice (Redclift, 2000; Purvis et al., 2019). What began as an environmental initiative now permeates medicine (Marten et al., 2018), education (Sustainability Directory, 2025), human resource management (Ehnert, 2014), accounting (Laine et al., 2021), and governance (Brown et al., 2009).

A. Theoretical Background

Modern global attention to sustainable development (SD) grew from the Brundtland Commission's *Our Common Future* (WCED, 1987), conceptualized sustainability as a regenerative balance (Goodland, 1995). Since then, the concept migrated into diverse fields: public health discusses sustainable health systems (Marten et al., 2018), HR professionals promote sustainable HRM (Ehnert, 2014), and corporate governance embraces non-financial disclosure through the Global Reporting Initiative (Brown et al., 2009). Elkington's (1994) Triple Bottom Line (TBL) institutionalised sustainability into managerial practice but was increasingly criticised for detaching

sustainability from ethical and cultural foundations (Milne & Gray, 2013; Kuhlman & Farrington, 2010). Further mainstreaming has occurred through ESG (Kotsantonis et al., 2016) and the SDGs (United Nations, 2015), yet global progress remains slow, with fewer than one-fifth of SDG targets on track (United Nations, 2015; 2024).

A growing body of literature argues that one reason for this persistent shortfall is the underdeveloped cultural dimension of sustainability, as well as the failure of global frameworks to meaningfully incorporate cultural epistemologies, Indigenous worldviews, and local value systems (Escobar, 2001; OECD, 2019). Sustainability, stripped of cultural grounding, risks becoming a managerial slogan rather than a moral, relational, and community-centred framework capable of guiding long-term transformation.

In this context, scholars have begun to articulate Quadruple Bottom Line (QBL) approaches, expanding TBL to include a fourth dimension—variously defined as wellbeing (Purcell & Nikolova, 2021), spirituality (Hamidi & Worthington, 2021), or ethical-cultural values (Ragazou, 2024). The existing policy examples, such as the Australia–New Zealand Water Quality Guidelines, already employ a Cultural–Economic–Social–Environmental framework (ANZG, n.d.). However, these applications remain sector-bound, producing fragmented interpretations of QBL with little theoretical cohesion or cross-disciplinary applicability.

A. Research Gap

Despite increasing recognition that Culture is essential to sustainable development, the existing literature lacks a holistic, theoretically grounded framework that systematically positions Culture as the foundation of sustainability. Current QBL models remain fragmented, sector-specific, and insufficiently theorised. Currently, there is no comprehensive model in the literature that describes how culture functions epistemically, normatively, and operationally within sustainability frameworks in governance, policy, and education. This paper addresses this gap by proposing a comprehensive QBL model that embeds Culture. According to the current literature, there is presently no comprehensive conceptual model that elucidates the epistemic, normative, and operational roles of Culture within sustainability frameworks spanning governance, policy, and education. beds Culture. Currently, there is no comprehensive model that explains the epistemic, normative, and operational roles of Culture in sustainability frameworks across governance, policy, and education. Culture at the centre of sustainability theory and practice.

Thus, this paper challenges TBL's long-standing dominance and offers a holistic shift: the conceptualisation of Culture as the normative and epistemic foundation of sustainability, restoring depth, ethics, and context to the practice and governance of sustainable development.

II. METHODOLOGY

This inquiry originated during my PhD studies (2017), where, from a Sri Lankan Non-Western cultural standpoint, I observed a persistent conceptual limitation in the Triple Bottom Line (TBL): its silence on Culture as a source of knowledge, ethics, and meaning. To address this, the study adopted an analytical mixed-methods approach combining a structured literature review, qualitative reflections, and exploratory field insights to articulate a Quadruple Bottom Line (QBL) framework.

A. Structured Literature Review (SLR) Using PRISMA-Aligned Logic

A structured literature review was undertaken to map how Culture appears explicitly or implicitly across sustainability frameworks (TBL; Raworth's 'doughnut economics,' 2012; 'planetary boundaries,' Rockström et al., 2009; SDGs, WCED, 1987) and across anthropology, Indigenous studies, ethics, sociology, and governance. This review followed the logic of PRISMA guidelines identification, screening, and thematic synthesis although the study did not apply a full formal PRISMA protocol because the aim was conceptual integration rather than meta-analysis.

1) Inclusion criteria: Peer-reviewed articles, books, policy frameworks, and Indigenous knowledge sources that explicitly or implicitly referenced cultural values, worldviews, ethics, sustainability principles, or stewardship practices.

2) Exclusion criteria: Purely technical, econometric, or engineering sustainability papers lacking cultural content; duplicate conceptual papers.

3) Justification: These criteria ensured that only sources addressing the relationship between Culture *and* sustainability (or the absence thereof) were retained.

The resulting body of literature was progressively coded thematically to identify:

(a) where Culture appears in sustainability discourse.

(b) where it is marginalised; and

(c) how it may be operationalised as a fourth pillar.

This SLR produced the conceptual foundation for theorising QBL.

B. Qualitative Reflections and Field Insights

Between 2018–2025, I engaged in unstructured, qualitative conversations with educators, community members, and practitioners some in “caring for Country” contexts and others in intercultural education settings. These were not part of my PhD research; they occurred independently afterwards as reflective engagements. The interviews were exploratory rather than systematic, and the sample was intentionally limited, used only to enrich conceptual insights rather than produce generalisable findings. Data captured from these conversations were converted into brief analytic memos.

1) Inclusion Criteria (Informal): participants with lived or professional experience in cultural governance, sustainability practices, or Indigenous knowledge.

2) Exclusion Criteria: none formally applied, consistent with the exploratory nature of the reflections.

3) Qualitative Analytic Process: Reflexive, iterative analysis was used to examine the qualitative materials. This included:

(a) Open Coding: identifying recurring cultural concepts (identity, stewardship kinship, ceremony, language, law/lore).

(b) Axial Coding: linking these concepts to sustainability dimensions addressing governance, stewardship, social systems, education, and intergenerational responsibility.

(c) Selective Coding: synthesising insights into QBL design principles and draft indicator domains.

4) Conceptual Stress-Testing: The evolving QBL model was stress-tested against real-world decision scenarios, including peer-reviewed case studies, policy documents, public-sector and corporate sustainability reports, curriculum frameworks, and commercial representations of sustainability.

To strengthen trustworthiness, insights were cross-checked against literature, policy case studies, and informal member-checking with two practitioners. A basic audit

trail of interpretive decisions was maintained. This iterative process clarified where Culture adds explanatory value to sustainability analysis.

C. Ethical Considerations

The study adhered to Indigenous data governance principles collective benefit, responsibility, ethical use, and respect for knowledge custodianship. Reflexive positionality was central: the analysis consciously acknowledged the influence of my Sri Lankan cultural background, professional experience, and engagement with Indigenous knowledge systems.

III. ORIGINS OF SUSTAINABLE DEVELOPMENT

The contemporary sustainable development (SD) agenda owes much to the post-war environmental awakening sparked by Rachel Carson's *Silent Spring* (1962). Released on September 27, 1962, Carson's work was a game-changer, distilling complex scientific findings on the ecological and public health impacts of synthetic pesticides, such as DDT, into accessible language. This shift from technical disputes to matters of public consciousness and political reform was a watershed moment. *Silent Spring*, as major historical reviews attest, brought to light the link between chemical use, ecological decline—especially among birds and aquatic species and human health with unprecedented clarity (Kroll, 2002).

The American Chemical Society's (ACS, 2012) historical landmark account states that the book “revolutionised how people understand their relationship with the natural environment” and helped drive regulatory action on air, water, and public health protection. The U.S. Environmental Protection Agency's official historical overview notes that rising public concern over pollution during the late 1960s and early 1970s was a key factor in the establishment of the EPA in December 1970 (U.S. EPA, n.d.). In 1972, DDT was banned in the United States for agricultural use, a decision shaped by the momentum created by Carson's intervention. This highlights the significant impact of public awareness and action in shaping environmental policy and the sustainability movement.

A second foundational milestone emerged with the World Commission on Environment and Development (WCED), chaired by Gro Harlem Brundtland, which released *Our Common Future* in 1987. The Report articulated what became the canonical definition of sustainable development:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations General Assembly, 1987, p. 43).

This definition appears at the beginning of Chapter 2 (Towards Sustainable Development) and sets two core principles:

- (1) the primacy of the basic needs of the world's poor, and
- (2) the limitations placed on the environment by technology and social organisation.

The Brundtland Report gained global political authority when the UN General Assembly formally endorsed it through Resolution 42/187 on December 11, 1987. The decision called for the Report to guide policy formation and collaborative action across the UN system—an influence documented in subsequent UN deliberations and environmental treaties (UN Docs A/42/427, p. 154). This global endorsement marked a significant step towards a unified, international approach to sustainability.

Although the Brundtland Report unified ecological and economic objectives, it also attracted sustained critique. Scholars argued that SD, as articulated in *Our Common Future*, reflected Western notions of progress, and underplayed non-Western epistemologies, relational worldviews, and place-based value systems (Escobar, 2001; Sachs, 1992). Others identified structural constraints within the SD paradigm, particularly its ambiguity in defining ‘sustainability’ and its inconsistent integration of social, ethical, and intergenerational concerns. For instance, the concept of ‘sustainability’ can be interpreted in numerous ways, leading to different priorities and strategies for achieving it. My premise is that the current ambiguity can hinder the effective formation and implementation of sustainability policies. Similarly, the inconsistent integration of social, ethical, and intergenerational concerns can lead to trade-offs and conflicts in decision-making (Holden et al., 2014, 2017).

These tensions between universal aspirations and culturally specific interpretations remain central to contemporary debates and directly inform the argument advanced in this paper: that the conceptual foundations of sustainability must be expanded to include Culture as a fourth, foundational layer explicitly. Culture, in this context, refers to the shared beliefs, values, and practices of a community, which shape ethics, meaning, and community responsibility across generations. Integrating Culture into the sustainability framework can help address the critique of SD as predominantly reflecting Western notions of progress and underplaying non-Western epistemologies and relational worldviews.

IV. TRIPLE BOTTOM LINE (TBL) FRAMEWORK

Alongside the intergovernmental uptake of sustainable development, business-oriented frameworks emerged in the 1990s to operationalise SD within corporate strategies. The most influential was John Elkington's Triple Bottom Line (TBL), conceptualised around *people, planet, and profit*. Elkington traces the coinage to 1994, elaborated through mid-1990s essays, and popularised in *Cannibals with Forks* (1997). In a widely cited retrospective in *Harvard Business Review*, he later argued that TBL had, over 25 years, been reduced to a narrow accounting metaphor and called for a “product recall” to restore its transformative ambition (Elkington, 2018). His earlier writing (Elkington, 1998) had explicitly framed TBL as an integrated layered model of economic, social, and environmental value creation, aligned with the spirit of sustainable development. The proposed transformation should inspire hope and motivation in a broad cross-cultural audience.

The diffusion of TBL coincided with the emergence of institutionalised sustainability reporting systems that sought to translate corporate responsibility into measurable practice. A significant milestone was the founding of the Global Reporting Initiative (GRI) in 1997, which resulted from a partnership between the Coalition for Environmentally Responsible Economies (CERES) and the United Nations Environment Programme (UNEP) (Brown et al., 2009). GRI guidelines—first published in 2000 encouraged firms to move beyond traditional financial disclosure and report systematically on social and environmental performance indicators. In parallel, Environmental, Social, and Governance (ESG) criteria gained prominence in the 2000s, with the UN Principles for Responsible Investment (UNPRI, 2006) promoting the integration of ESG considerations in capital markets. ESG metrics enable investors to evaluate firms' ethical performance and risk exposure (Kotsantonis, Pinney, & Serafeim, 2016), thereby reinforcing sustainability as an investment heuristic.

However, institutionalisation of SD also revealed profound limitations of the TBL. Critics argue that both TBL and ESG frameworks privilege *quantitative disclosure* over *qualitative transformation*, reproducing the managerial logic that Elkington later critiqued (Eccles & Klimenko, 2019). Banerjee (2003) notes that mainstream sustainable development in management and organisational studies is influenced by economic reasoning and Western ideas about resource management. On this view, sustainability discourses convert ‘nature’ into a governable ‘environment,’ embedding technocratic and often neo-colonial assumptions that marginalise Southern socio-ecologies. These critiques highlighted the Brundtland Report’s elasticity useful for consensus-building yet highly susceptible to managerial co-optation and explain why TBL’s diffusion generated rhetoric of measurement rather than a substantive reorientation. It is not important, but urgent to shift the focus towards qualitative transformation to make a difference in sustainability.

Fundamentally, TBL attracted sustained critique for conceptual ambiguity and for reproducing Western developmental logics. Sachs (1992) and Escobar (2001) argue that development—and, by extension, sustainable development—are discourses rooted in Euro-American histories of modernity, planning, and economic rationality. Sachs’s *Development Dictionary* (1992) examined late-20th-century UN projects as proliferating into problem-specific silos under the banner of development. Similarly, Escobar (1987, p. 430) documented how development expertise produced ‘Third World’ subjects and governance structures within a global knowledge–power hierarchy. These critiques illustrate how sustainability, when operationalised through TBL, risks defaulting to a mode of ‘managerial incrementalism’, a term used to describe a cautious, step-by-step approach to change that may not lead to transformative outcomes (Lindblom, 1959).

Scholars also contend that TBL legitimised symbolic compliance and ‘tick-box’ reporting rather than transformative change (Milne & Gray, 2013; Norman & MacDonald, 2004). The integrated-TBL framework (Slaper & Hall, 2011, pp. 4–8) attempted to link the economic, social, and environmental pillars, but still neglected the cultural and ethical dimensions that inform how communities interpret needs, responsibilities, and wellbeing. In this sense, TBL’s architecture contains a structural gap: it offers a three-pillar model of sustainability without the epistemic, moral, and relational foundation that only Culture provides. The exclusion of Culture affects TBL’s ability to address diverse worldviews, Indigenous stewardship traditions, and non-Western formulations of collective wellbeing, thereby undermining the universal relevance and practical effectiveness of sustainability. However, by identifying these limitations, we can work towards a more inclusive and globally relevant SD framework, thereby enlightening and informing the proposed QBL approach to sustainability.

V. QUADRUPLE BOTTOM LINE (QBL) FRAMEWORK

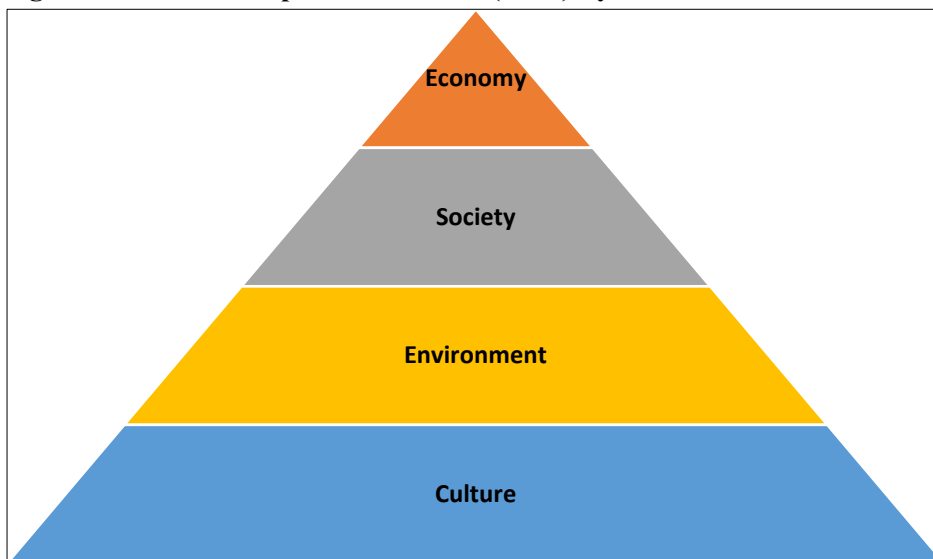
In response to the structural limitations of the Triple Bottom Line (TBL), this paper proposes the Quadruple Bottom Line (QBL) as an expanded and theoretically grounded framework that embeds Culture as a fourth and foundation of sustainability. While the TBL model accounts for economic, social, and environmental performance, it remains conceptually incomplete: it does not recognise Culture the shared values, worldviews, ethics, and knowledge systems that shape how societies understand wellbeing, obligation, governance, and ecological responsibility. The QBL framework addresses this critical research gap by integrating Culture not only as an independent pillar but as the epistemic foundation that informs the other three.

The body of literature concerning Corporate Social Responsibility (CSR) has consistently recognised the importance of establishing an ethical basis. (Carroll 1991, 1999). The CSR pyramid encompassing economic, legal, ethical, and philanthropic responsibilities aligns closely with the QBL architecture, particularly in its emphasis on ethical and nor Similarly, Dyllick and Hockerts (2002) conceptualise CSR as the reconciliation of profit with responsibility, while Porter and Kramer's (2011) shared value thesis reframes competitiveness as a generator of social benefit. However, these frameworks often operate without explicit cultural legitimacy. Critics such as Banerjee (2003) argue that CSR can become rhetorical if it fails to acknowledge the cultural contexts and power relations through which responsibilities are defined and enacted. Embedding Culture within QBL directly mitigates this risk by grounding sustainability in community values, relational worldviews, and culturally informed ethics.

By articulating Culture as the base of sustainability, the QBL framework clarifies that environmental stewardship, social wellbeing, and economic justice do not arise independently of cultural meaning systems. Instead, they are interpreted, prioritised, and implemented through cultural norms, traditions, and cosmologies. QBL therefore provides a more coherent and context-sensitive model for sustainable governance, policy development, and community resilience.

The conceptual relationship of Culture among the four layers is represented in Figure 1. Culture forms the foundational base of sustainability, supporting the three upper layers—Environment, Society, and Economy—within the QBL model. In doing so, QBL offers a holistic framework that addresses the conceptual and operational gaps left by TBL and sector-specific variations of QBL. (Figure 1).

Figure 1: The Quadruple Bottom Line (QBL) Pyramid



Source: Govinnage (2017), Govinnage & Mohammadi (2025), inspired by Carroll's CSR Pyramid (1991, 1999).

Two significant implications follow from shifting from the Triple Bottom Line (TBL) to a fully articulated Quadruple Bottom Line (QBL). First, sustainable development was historically developed at the intersection of Western environmental science, Northern regulatory reforms, and the UN development planning system. Its global

institutionalisation, particularly through UN ratification and the diffusion of Brundtland's framework, created a state-centric architecture in which managerial tools such as TBL were readily absorbed. This genealogy explains why SD often appears Western in its epistemologies, assumptions, and measurement systems: the conceptual frameworks were shaped within Global North policy traditions and then internationalised through UN processes (UN Docs A/42/427, n.d.).

Secondly, the critical literature demonstrates that any meaningful deepening beyond TBL requires taking Culture seriously—not as a decorative addition or symbolic ‘fourth layer,’ but as the foundational layer through which ethics, shared meaning, identity, and community resilience could be incorporated. Culture influences how sustainability is *understood, governed, and lived* (Hawkes, 2001; Dessein et al., 2015; Soini & Birkeland, 2014; UNESCO, 2013; UCLG, 2010). Embedding Culture into the sustainability framework, therefore, responds to longstanding critiques that SD has lacked moral precision and cultural contextualisation.

A culture-centred approach also re-opens space for Indigenous custodianship, relational ontologies of nature, and localised stewardship practices that resist the reductive managerialism often associated with TBL and technocratic interpretations of SD. This move directly answers Sachs's (1992) and Escobar's (2001) warnings that development discourse is grounded in Euro-American histories of modernity, planning, and economism. It also aligns with Elkington's (2018) call to ‘recall’ the TBL—signaling that its practice has become diluted and needs rethinking.

Sen's (1999) capability approach reinforces this shift. He argues that development must extend beyond economic growth to include the expansion of human freedoms and the enrichment of human lives through education, health, and well-being (pp. 30–31). From this perspective, Culture becomes the foundation of human development because it shapes the values, ethics, identities, and knowledge that determine how individuals and communities use resources to achieve freedom and well-being. Sen's insight strengthens the case for integrating Culture into the QBL: sustainable development must cultivate the cultural, social, and institutional freedoms that enable long-term ecological and socio-economic balance.

In summary, the QBL framework by integrating Culture as its foundational pillar offers a historically informed and critically aware approach to sustainability. I hypothesise that the proposed QBL framework could play a crucial role in restoring human meaning, ethical intentionality, and justice-centred reasoning to the sustainability agenda. This restoration should engage and connect us all, reminding us of the human values at the core of sustainability. Instead of remaining an economically driven or environmentally/socially measured paradigm, sustainability under QBL becomes a culturally embedded, relational, and community-grounded pathway that supports diverse worldviews and fosters inclusive, transformative development.

VI. CULTURAL INTEGRATION AND INDIGENOUS KNOWLEDGE

Culture constitutes the moral, epistemic, and ontological foundation of societies. Classical anthropology long recognised that sustainability cannot be separated from how people interpret and inhabit their environments. Tylor (1871) defined culture as “that complex whole which includes knowledge, belief, art, morals, law, and custom” (p. 1), while Geertz (1973) framed it as the “webs of significance” (p. 5) through which humans create meanings. In organisational studies, Schein (2010) extended this understanding into institutional life, describing culture as a pattern of shared assumptions learned as

groups solve problems (p. 18). In total, these perspectives affirm a central premise: Culture shapes collective reasoning, ethical judgment, and responses to environmental change, grounding sustainability in lived meaning rather than abstract metrics.

Indigenous knowledge deepens this foundation by affirming relational, reciprocal ontologies of life. For Indigenous Peoples in Australia, the environment is not an external resource, but a living network of relationships underpinned by moral responsibility. Little Bear (2000) describes Indigenous cosmologies as grounded in holism the interdependence of all beings (p. 77). Cajete (2000) conceptualises “Native science” as a knowledge rooted in reciprocity, interconnection, and spirituality (pp. 64–65). Aboriginal and Torres Strait Islander Peoples in Australia understand *Country* as an indivisible nexus of land, water, sky, and kinship (AIATSIS, 2020, p. 2). Sustainable way of life thus means maintaining reciprocity with Country through ceremony, story, art, and everyday practice.

Ingold (2000) argues that identity emerges through dwelling in place (p. 153), while Escobar (2001) insists that “culture sits in places” (p. 141), challenging universalist sustainability frameworks that abstract populations from their ecological contexts. This relational worldview exposes a fundamental limitation of the Triple Bottom Line (TBL): although TBL has institutionalised economic, social, and environmental accountability, it frequently reduces ethics and meaning to managerial indicators. Embedding Culture as the foundation of sustainability restores depth, legitimacy, and moral orientation clarifying why and for whom sustainability matters.

Recent interdisciplinary scholarship demonstrates the practical implications of cultural knowledge for ecological stewardship. Christianson (2015) synthesises research on Indigenous fire stewardship across Australia, Canada, and the United States, showing that cultural fire practices enhance biodiversity, prevent catastrophic wildfires, and maintain community identity (pp. 190–200). These practices operationalise a relational ethic: humans and ecosystems co-adapt through ceremonies, observations, and the transmission of intergenerational knowledge.

Similarly, Christianson, McGee, and L'Hirondelle (2013) show how Aboriginal wildfire experiences shape community preferences for mitigation and risk governance (pp. 527–536). These findings reveal that risk is interpreted through cultural memory and spiritual understanding, reframing fire not merely as a hazard, but as a natural process that requires stewardship. Voggesser et al. (2013) extend this argument by examining the cultural impacts of climate change on forest-dependent tribes in North America (pp. 615–626). They demonstrate that shifts in forest structure, water cycles, and wildlife patterns threaten not only material livelihoods, but also ceremonial practices, governance traditions, and cultural continuity. Sustainability, therefore, cannot be separated from cultural resilience.

These insights, drawn from literature, support the Quadruple Bottom Line (QBL) framework by establishing that culture is not an ornamental artefact, but a constitutive foundation of sustainability. Western sustainability models that overlook Indigenous epistemologies may undermine trust and lead to ineffective results. Conversely, participatory approaches grounded in cultural legitimacy generate more durable, just, and context-appropriate results. Both Christianson (2015) and Voggesser et al. (2013) emphasise that successful co-management depends on recognising Indigenous authority, valuing local knowledge, and fostering genuine partnerships not tokenistic consultation. This lesson applies globally. Across Latin America, Africa, and Asia including India, Sri Lanka, and Thailand community cosmologies, religious traditions, and customary practices can facilitate raising awareness of resource management, conflict resolution, and social cohesion. Integrating these worldviews requires both methodological and

moral transformation: moving from knowledge extraction to knowledge coexistence. Oral histories, traditional ceremonies, and diverse, community-based practices, as well as various rituals, must be treated as legitimate epistemic contributions to culture. Environmental management becomes a practice of reciprocity rather than control; fire, forest, and water governance become relational duties connecting people across generations.

Embedding these insights within a QBL architecture re-centres Culture as the epistemic and normative foundation beneath the economic, social, and environmental pillars. In this paradigm, sustainability becomes a living relationship between people and place uniting science with story, ecology with ethics, and governance with care.

In summary, Indigenous knowledge demonstrates that sustainability is not a technical problem but a cultural relationship. As climatic and ecological crises intensify, integrating Culture into sustainability frameworks is not optional it is essential for legitimacy, justice, and survival. The QBL model acknowledges this reality: Culture is the pulse that sustains the human–Earth relationship and enables the reciprocity necessary for a fragile planet. As Carl Sagan's "Pale Blue Dot" (1994) so powerfully illustrates, every civilisation, ritual, religion, and war has unfolded on this small, shimmering world. Culture, therefore, becomes the interpretive lens through which we recognise our shared fragility and cultivate the humility, care, and planetary ethics required for sustainable futures.

VII. CULTURE AND ETHICS: THE MORAL FOUNDATION OF SUSTAINABLE DEVELOPMENT

Culture and ethics are closely linked aspects of human behavior, working together to create the ethical basis for sustainable development. "Ethics may be broadly defined as the systematic study of what is morally right and wrong, good and bad" (Beauchamp & Childress, 2019, p. 1). Aristotle's *Nicomachean Ethics* (2000) situates ethical judgement within *phronesis* practical wisdom acquired through habituated conduct shaped by the *polis*, the cultural community. Moral virtue, in this classical view, emerges not from isolated rules but from embodied participation in a shared cultural life.

Contemporary moral philosophy reinforces this perspective. MacIntyre (2007) argues that ethics consists of "socially embedded practices" negotiated within traditions that confer meaning on norms and virtues (pp. 222–225). Ethical reasoning, therefore, is never abstract or universal in form; it is culturally grounded. Culture provides the moral grammar through which duties, responsibilities, and virtues are reflected and justified. Geertz (1973) offers a similar insight, describing culture as "webs of significance" (p. 5) that humans themselves spin symbolic systems through which communities interpret experience and evaluate right action. Culture, in this interpretation, is not an objective artefact but a living framework of shared meaning that shapes moral perception.

Ethics, in turn, explains how individuals and communities navigate these cultural webs toward the social good. In public health, Beauchamp (2013) demonstrates that ethical judgment is inseparable from cultural narratives of responsibility, fairness, and care. Cultural context shapes what people value, justify, and priorities. For development practitioners, this means ethical decision-making must always be situated; moral legitimacy arises only when development resonates with the cultural norms, institutions, and narratives of the communities it seeks to serve.

Development ethics scholarship underscores this point. Goulet (1995) argued that "values define the ends of development" (p. 36) and that technical planning without ethical consideration risks moral failure even when projects appear economically

successful. When development interventions disregard cultural ethics such as collective land tenure, sacred relationships with the environment, or community-based decision-making, they undermine trust and legitimacy. Traditional Indigenous practices existed for millennia in Australia and Canada, for example, embed ethical codes of reciprocity, stewardship, and kinship that strengthen ecological balance (Cajete, 2000; Little Bear, 2000). Integrating these norms into project governance helps establish sustainability in lived moral orders rather than externally imposed logics.

In organisational contexts, business ethics research highlights the normative power of culture. Treviño and Nelson (2021) describe ethical culture as the interplay of formal and informal systems leadership, norms, symbols, and stories—that guide an organisation's moral climate. Cross-cultural ethical scholarships similarly demonstrate that managers interpret concepts such as fairness, accountability, and duty through culturally specific lenses (Donaldson, 1996; Cajete, 2000). Development programs that transplant universal ethical codes without translating them into local cultural idioms often encounter resistance or only superficial compliance.

Culture and ethics within sustainability frameworks ensure that development remains not only technically or economically sound but morally grounded. Within the Quadruple Bottom Line (QBL), Culture functions as a moral algorithm, guiding economic systems toward equity and supporting stewardship. SD depends on moral legitimacy, which emerges when development aligns with the cultural values, ethical norms, and identities of the communities it seeks to uplift (UNESCO, 2022).

VIII. CULTURAL CONTEXTUALISATION AND THE SDG IMPLEMENTATION GAP

Development, economic, and environmental programs must be contextualised within a country's cultural framework. Without recognising the social norms, customary values, and Indigenous knowledge systems that shape collective behavior, even well-funded interventions risk failure. The Organisation for Economic Co-operation and Development (OECD, 2005; 2019) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2013; 2020; 2022) increasingly emphasise the centrality of cultural localisation in policy design. Culture influences how communities interpret sustainability, trust institutions, negotiating change, and embed new behaviors in everyday life.

UNESCO's *Culture 2030 Indicators* and the *MONDIACULT 2022 Declaration* make this explicit by identifying Culture as both an enabler and driver of sustainability. Paragraph 19 of the Declaration reaffirms this commitment:

“...we commit to a multilateralism that recognises culture as a global public good, having intrinsic value, and as a driver and enabler of sustainable development.” (UNESCO, 2022, para. 19).

Despite this recognition, cultural integration remains peripheral in many global development strategies. Current global monitoring reveals that only around 17% of the Sustainable Development Goals (SDGs) are on track (United Nations, 2024; Sustainable Development Report, 2024). However, nearly half show limited progress, while more than one-third are stagnating or regressing. Although financial and geopolitical factors contribute to this outcome, insufficient cultural contextualisation also plays a significant role. The SDGs contain no stand-alone goal dedicated to cultural sustainability, and no binding UN directive requires member states to embed Culture-based indicators in national SDG strategies. UNESCO's *Culture 2030 Indicators* and the *Hangzhou Declaration* (2013) offer guidance, but adoption is voluntary and uneven.

Many global sustainability frameworks fail to account for cultural factors like social meanings, rituals, identities, and perspectives, creating a major gap between policy design and practical implementation. As UNESCO (2022) notes, culturally informed approaches enhance trust, strengthen local legitimacy, and promote long-term behavioral change.

Drawing on my cross-cultural public service and civil society experience, meaningful cultural integration requires three interrelated steps:

(a) conducting cultural diagnostics to identify local institutions, belief systems, cosmologies, and informal norms that mediate program uptake.

(b) employing co-design and consent mechanisms such as Free, Prior, and Informed Consent (FPIC) to ensure legitimacy and shared ownership; and

(c) developing national cultural indicators, a set of metrics aligned with UNESCO's *Culture|2030* framework, to complement economic, social, and environmental metrics.

These steps directly align with the conceptual logic of the Quadruple Bottom Line (QBL), which positions Culture not simply as an additional pillar but as the foundation supporting the Economy, Society, and Environment. Figure 1 presents the QBL diagram, which represents this architectural framework. The diagram demonstrates how cultural vitality, ethical systems, and community meaning serve as foundational elements supporting all aspects of sustainability.

By embedding Culture into sustainability policy, governments can address the relational and identity-based factors that influence program success. OECD (2019) and UNESCO (2020; 2022) demonstrate that culturally grounded strategies foster trust, strengthen innovation, and reduce resistance to change. Nevertheless, progress on the SDGs remains limited, partly because cultural metrics are optional. Embedding Culture through participatory design and culturally specific indicators provides a pathway to close this implementation gap strengthening the localisation of SDGs and operationalising the QBL framework (UNESCO MONDIACULT, 2022; United Nations, 2024).

IX. FUTURE RESEARCH DIRECTIONS

Future research should empirically test the QBL framework across regions and sectors, with particular attention to how Culture shapes relationships, leadership dynamics, community engagement, and long-term sustainability outcomes. This is especially important in Latin America, Africa, and Asia, where cosmology, ritual practice, and cultural traditions remain deeply embedded in everyday life and continue to influence collective behavior.

Sri Lanka provides a compelling example. The Sinhalese and Tamil New Year (*Aluth Āvrudda*) is a national cultural celebration grounded in centuries-old cosmological and agricultural traditions dating back to the Kandyan Kingdom (Kappagoda, n.d.). The festival takes place at specially chosen times, known as *nekath*, which are set based on astrological advice related to the Sun moving from Pisces (*Meena*) to Aries (*Mesha*). These ritual timings guide household activities, communal gatherings, ceremonial food preparation, and acts of renewal such as offering gifts to elders.

Despite its cultural significance, such events are rarely integrated into formal development planning or SDG localisation frameworks. The limited presence of such cultural touchpoints in UN project documentation suggests a gap in how cultural assets are mobilised for sustainability. From a sustainability governance perspective, events like *Aluth Āvrudda* New Year in Sri Lanka as a symbol of seasonal renewal, provides an effective opportunity to promote sustainability initiatives. These initiatives are designed to reflect and promote harmony, fostering a sense of peace and alignment with the

natural world in our sustainability efforts. These values possess normative power that can support SDG-aligned behavioral change, even if they at first glance fall outside strictly technocratic planning models. UNESCO's cultural policy research notes that Culture is 'crosscutting' and can influence multiple SDG targets (UNESCO Courier, 2022). As the *Courier* notes:

"The indirect benefits of culture are accrued through culturally informed and effective implementation of the development goals." (p. 12).

Sri Lanka's Sustainable Development Council is entrusted with coordinating the national SDG program and monitoring (Sri Lanka SDC, 2024). However, the roles of cultural festivals, ritual timings, and embedded cosmological systems remain underexamined within their formal structures. This reflects a broader global pattern in which Culture is acknowledged as important, but rarely operationalised. Given this context, there is a pressing need for longitudinal, comparative, and community-based studies on the role of cultural practices in shaping sustainability outcomes. Future research might explore, for example:

- (a) How aligning SDG-awareness campaigns with local festive calendars (e.g., *Aluth Avurudda* in Sri Lanka, and *Songkran* in Thailand) increases public engagement.
- (b) How cultural rituals can facilitate community buy-in for resource conservation, waste reduction, or climate adaptation.
- (c) How Indigenous knowledge and astrological timing systems can enhance resilience and local legitimacy in sustainability programs.

Such investigations would provide empirical foundations for the Quadruple Bottom Line (QBL). Furthermore, future research could establish that Culture is not a peripheral item, but embedded in daily life, ritual practices, community identity, and long-term positive environmental behavior.

X. RECOMMENDATIONS

The following are examples of suggested practical steps for implementing more comprehensive and effective sustainability measures that adopt the QBL framework.

A. Governance and Policy:

Formally recognise Culture as a sustainability foundation in statutes, strategies, and reporting. This means requiring QBL impact statements for major initiatives, which must evidence free, prior, and informed consent, intergenerational benefits, and place-based cultural continuity, and establishing Indigenous -led advisory bodies with decision-making rights.

B. The Cultural Dimension - Integrating Local Wisdom:

Sustainability must incorporate cultural memory and expertise, such as Australia's Indigenous fire management practices, which reduce bushfire intensity and regenerate biodiversity (Ens et al., 2015). As another example, Sri Lankan water governance traditions harness ritual and participatory mapping, and community data hubs can enhance local knowledge (Escobar, 2018).

C. Land, Water, and Climate Programs:

Caring for Country initiatives with long-term funding; recognising Indigenous peoples' fire mitigating practices, recognising localised seasonal calendars, and biocultural indicators as valid environmental evidence. (Molden & Sakthivadivel, 1999).

D. Measurement and Disclosure:

Develop a QBL scorecard with cultural indicators (e.g., language vitality, cultural workforce participation, continuity of practices in the Country, cultural safety in services). Publish alongside economic, social, and environmental KPIs and link to budget allocations and procurement.

E. Education and Capability:

Co-design curricula that treat *Culture* as a knowledge system (ethics, law/lore, ecology, craft). Build staff capability in cultural governance, yarning/participatory methods, and place-based evaluation. Fund community-led teaching residencies and knowledge-keeper fellowships.

F. Investment and Procurement:

Prioritise suppliers demonstrating cultural governance (Indigenous ownership/leadership, cultural safety standards, benefit-sharing). Use outcome-based contracts tied to QBL indicators.

G. Research and Evaluation:

Adopt Indigenous data sovereignty principles and utilise longitudinal QBL evaluations to track cultural and intergenerational outcomes.

F. The Future of Work: Building Sustainability Skills:

Automation and AI reshape labour markets. We must pair sustainability literacy with digital literacy, so innovation aligns with responsibility (World Economic Forum, 2020; Raworth, 2012). Interdisciplinary education such as computer science combined with ecology, and economics paired with ethics and cultural knowledge develops systems thinking and moral reasoning (UNESCO, 2022).

H. Implementation Roadmap:

Phase One (Co-design indicators & baselines). Phase Two (Pilot in one policy, one education, one procurement setting). Phase Three (Scale with guidance, accreditation, and digital dashboards).

XI. CONCLUSION

Sustainability's evolution from *Silent Spring* to *Our Common Future* and the Triple Bottom Line (TBL) reveals humanity's enduring effort to reconcile material progress with ethical responsibility and ecological integrity. Although sustainability emerged as a profoundly moral and culturally embedded idea, its institutionalisation within corporate and policy frameworks progressively narrowed its scope, often stripping away the ethical, relational, and cultural values that once animated it (Hamidi & Worthington, 2021). The TBL framework often encouraged a managerial focus, narrowing sustainability to economic or environmental metrics that overlook culture and lived experience (Hawkes, 2001; Elkington, 1998).

This paper addressed a critical deficiency in the existing sustainability discourse: the absence of a holistic, theoretically grounded framework that systematically positions Culture as a foundational layer of sustainable development. As noted in literature, contemporary sector-specific QBL models, whether they are focused on wellbeing, spirituality, or alternative value domains (Purcell & Nikolova, 2021; Tiller et al., 2022; Ragazou, 2024) have illuminated the need for a fourth dimension but remain fragmented and limited in application. They demonstrate momentum, but not yet a coherent paradigm shift.

In response, this paper proposed a comprehensive Quadruple Bottom Line (QBL) model in which Culture becomes the normative and epistemic foundation of sustainability. (Figure 1). Under the proposed framework, Culture is not a decorative extension to TBL; it is the interpretive lens through which societies define ethics, evaluate progress, regulate relationships with nature, and imagine futures. Cultural worldviews whether Indigenous Australian principles of caring for Country, Sri Lankan cosmologies, or other place-based traditions shape how communities understand responsibility, reciprocity, and intergenerational justice, the moral centerpiece of the Brundtland Report.

Embedding Culture as the foundation of sustainability moves development from a mere technical exercise to a relational ethic. Culture shapes how societies value education, health, wellbeing, and environmental care, guiding economic systems toward fairness, social systems toward inclusion, and ecological governance toward stewardship and reciprocity. This reconceptualization restores to sustainability the moral precision, contextual sensitivity, and community relevance that global frameworks have long struggled to achieve.

Furthermore, cultural integration clarifies why the protection of biodiversity is not solely an environmental requirement but a moral, cultural, and civilisational obligation. My premise is that the destabilisation of ecosystems also destabilises cultural memory, identity, and long-term human flourishing an echo of what Rockström et al. (2009) warned about in their planetary boundaries' framework. Recognising this interconnectedness grounds sustainability within the broader 'web of life, honoring the ethical responsibilities we carry toward future generations.

Ultimately, embracing Culture as the foundation reconnects sustainability with its human-centered roots. It reminds us that our shared pursuit of development must remain anchored in humility and relational care qualities poignantly captured in Carl Sagan's image of the 'Pale Blue Dot' (1994), where human aspirations, conflicts, and hopes to unfold on a fragile planet suspended in cosmic darkness. By restoring Culture to the foundation of sustainability discourse and practice, the QBL framework offers a pathway toward a more ethical, inclusive, and enduring model of development one capable of guiding communities, institutions, and nations toward a just and regenerative future.

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