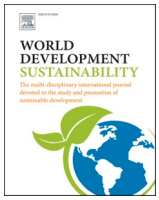
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Nature-based tourism: Perceptions of sustainability and innovation in business models

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ABSTRACT

This study explores the perceptions of nature-based tourism (NBT) entrepreneurs, public institutions, and an NGO regarding the role of sustainability and innovation in NBT business models and their contribution to competitiveness and long-term business resilience. An exploratory qualitative research design with an inductive approach was adopted. Seventeen semi-structured interviews were conducted in Portugal: thirteen interviews with NBT entrepreneurs, three with public institutions, and one with an NGO. Content analysis was used to examine the interviewees' perceptions. The findings reveal contrasting perceptions among NBT entrepreneurs, public institutions, and NGO on the topics covered. This study extends the existing body of research on innovative sustainable business models in NBT by analysing these perceptions and their roles in long-term business resilience and competitiveness. It proposes a framework for an innovative sustainable business model for NBT, in line with the UN Sustainable Development Goals and the UN 5Ps-Planet, People, Partnership, Prosperity and Peace.

1. Introduction

Nature-based tourism (NBT) encompasses nature as both a service provider and a product marketed by suppliers and consumed through tourists' experiences [1]. It typically occurs in areas with relatively low levels of human intervention [2] and is largely composed of small, often family-owned businesses operating in rural contexts [3]. Despite its growth potential, the sector is characterised by fragile performance and limited competitiveness [4]. Previous research suggests that adopting innovative practices can enhance both business sustainability [5,6] and performance outcomes [7–9]. However, such improvements depend on the existence of clearly articulated business models that integrate value-creation, delivery, and capture mechanisms [8]. Through innovative business models (IBMs), NBT firms can strengthen value creation processes and improve customer engagement [10]. Nevertheless, the literature on NBT remains limited in addressing the intersection between business model innovation (BMI) and sustainability across its multiple dimensions [5,6].

This gap is particularly evident in small and rural tourism enterprises, where entrepreneurs frequently face managerial limitations and knowledge deficits related to sustainability and business model development [5,8]. These constraints hinder innovation and business model transformation [11]. Although the concept of sustainable business models (SBMs) has gained prominence, its application within the NBT context remains underexplored [7]. This is particularly problematic given that NBT operates at the intersection of environmental conservation, local value creation, and market competitiveness. As such, it represents a critical empirical setting for advancing SBM theory.

Against this backdrop, this study builds on the concept of Innovative Sustainable Business Models (ISBM) as a theoretically relevant framework tailored to the specificities of NBT firms. The study's originality lies in bridging SBM and BMI literature with the operational realities of NBT, including resource constraints, seasonality, strong dependence on natural capital, and the co-creation of value with local communities. By explicitly linking ISBM principles to these contextual dynamics, the study extends SBM theory beyond generic applications into a sector where sustainability is not only strategic but also foundational to business survival.

The theoretical relevance of this research is twofold. First, it contributes to the ongoing debate on how sustainability can be effectively

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embedded in business models by proposing a context-sensitive ISBM framework that integrates environmental, social, and economic dimensions holistically. Second, it addresses a recognised gap in tourism and entrepreneurship literature by providing empirical evidence on how NBT firms interpret and operationalise sustainability and innovation within their business models. In doing so, the study responds to calls for more applied and sector-specific ISBM research [12].

Methodologically, the study employs an exploratory, qualitative design grounded in an inductive approach. Empirical data were collected through seventeen semi-structured interviews conducted with NBT entrepreneurs, representatives of public institutions, and an NGO in Portugal. Data analysis followed a triangulation strategy, combining interview data with secondary sources to ensure robustness. The interviews were guided by a semi-structured protocol comprising five thematic areas: (i) company profile; (ii) sustainability practices; (iii) innovation processes; (iv) long-term business resilience and competitive advantage; and (v) market and customer characteristics. The analysis involved transcription, iterative coding, and cross-validation with company documentation, including websites.

Based on these considerations, the study pursues two research objectives: first, to exploratorily understand NBT entrepreneurs' views on sustainability, innovation, competitive advantage, and long-term business resilience within their business models; and second, to propose an ISBM framework tailored to NBT firms.

2. Theoretical background

2.1. Nature-based tourism and sustainable development

The democratisation of tourism has led to its massification, and consequently, to significant environmental, socio-cultural, and economic challenges [13]. Environmental assets support economies and NBT, which depend directly on the conservation status of ecosystems [14]. Annual visitors increase by 35% due to NBT [15], requiring entrepreneurs to adopt measures to conserve and sustainably manage natural resources while bolstering competitiveness through ecosystem services and conservation efforts [16].

Fredman et al. [17] defined NBT as "human activities occurring when visiting nature areas outside the person's ordinary neighbourhood" (as citedPlease add the reference or delete the citation . in [17], p.181). Other definitions of NBT emphasise recreation and adventure [1] or describe NBT as a cultural service provider that raises public awareness and provides financial support for biodiversity conservation [18]. NBT is also described as a branch of tourism that sells nature through nature-related experiences [2] and as a driver of regional development, diversifying rural-based economies [2,19,20]. It represents a new business opportunity supported by increased purchasing power [21] and a more sophisticated NBT offer [22,23]. This study considers NBT as a responsible form of tourism, with an overnight stay, in protected or unprotected areas, aimed at enjoying biodiversity, landscapes, recreation, silence, culture, gastronomy, and slow living, supported by local production, contributing to fair employment, heritage and nature conservation, population settlement, and promoting the circular economy [5]. It is supported by local production, contributing to fair employment, heritage and nature conservation, population settlement, and the promotion of a circular economy [5].

The Portuguese National Nature Tourism Program (2015) and the trademark Natural.PT established NBT as an integrated practice encompassing diversified activities, including the enjoyment of the natural environment in its various forms across classified areas, promoting tourism development, enhancing natural and cultural heritage, and catalysing local and regional development. Therefore, firms should identify and organise all resources related to NBT experiences (Fossgard & Stensland, 2020), considering sustainability and innovation as fundamental drivers of an inclusive and resilient sector [24].

Butler [25] highlighted the challenges of introducing the concept of sustainable development in NBT, given its direct impact on the natural environment. The Earth Summit in Rio de Janeiro in 1992 extended the concept of sustainable development to Tourism, introducing the notion of sustainable tourism [26]. This concept has been applied in various ways [27], yet discrepancies persist between discourse and practice [28,29]. Sustainable tourism is a multi-dimensional concept [30–32] and aims to mitigate environmental, economic and social impacts while improving population well-being [33,34]. This principle should apply to all forms of tourism [35,36]. According to UNWTO, sustainable tourism "takes full account of its current and future economic, social and environmental impacts, addressing the visitors' needs, the industry, the environment, and host communities" (UNWTO, n.d.; [37]).

Sustainable tourism should align with tourists' expectations (UNWTO, n.d.), promoting the exchange of goals rather than mere balance [5]. For NBT, sustainability must be understood as a fundamental driver of long-term business and resilience [38,39]. Thirty years after the concept emerged, there remains a need to develop innovative products, services, and destination management [40], as well as robust measurement indicators [25,27,35,41,42]. This must be accompanied by recognising changes in customers' expectations and the evolution of natural and cultural resource management objectives, enabling the identification of key trends and the anticipation of necessary changes [21] to achieve the goals of sustainable tourism [43]. NBT firms should plan for the long term to improve economic benefits, local well-being, environmental protection, and tourist experiences [44], transforming good places to visit into amazing places to live. The principles of sustainable development are essential to NBT, as the sector's long-term viability depends on protecting natural ecosystems, supporting local communities, and balancing economic activity with environmental stewardship [7,45].

2.2. Innovation and sustainability in business models

Tourism planning and management require business models tailored to organisational realities [12]. Although no consensus definition exists [46,47], business models are widely regarded as dynamic [48], strategically aligned [49], and significant for both practice and research [50], yet inconsistently applied [51]. Some authors define business models as a set of distinct elements [52,53]), others as a strategy [54], or as descriptions of how organisations function to achieve goals such as profitability, growth, and social impact [55]. Lüdeke-Freund et al. [56] consider business models as an activity system, where the dynamic interrelation of activities differentiates it from conventional business models.

Business models require structural change to operationalise sustainability [57]. Business models mediate innovation and stakeholder expectations, embedding sustainable business model (SBM) principles [58]. In tourism, business model evolution involves transitioning to new configurations [6]. Business model innovation (BMI) encompasses novel, nontrivial changes to business model elements [59], requiring redesign [11], internal reorganisation, and strategic change [60], supported by creativity and problem-solving [61]. For NBT firms, I demands extensive organisational shifts [4,62] and contributes to competitiveness, inclusiveness, resource efficiency, and empowerment ([9,11,55,63,64]; UNWTO, n.d.). BMI links strategy with existing business models [65,66], modifies business model schemes [67], and may be imitated [64]. Customers can co-create innovation [68], yet BMI often fails due to weak development methods [12,69]. Nevertheless, combining BMI with sustainable value propositions strengthens competitiveness and sustainability [12,58,60,70], although it entails commitment amid uncertainty for customers, suppliers, and managers [71].

Research on innovation in tourism remains limited [72,4], with low levels of product, process, and technological innovation [73,74]. Literature on BMI in tourism is sparse; the introduction of innovation in the tourism business model is considered vital [5,7]. The Business Model Canvas [75] introduced a new perspective that incorporates

Table 1
Summary of the SBM frameworks versus the proposed ISBM for NBT firms (Author's elaboration).

Framework / Author(s)	Core Focus / Contribution	Limitations Identified in the Literature	How the Proposed ISBM Builds on this Framework
Business Model Canvas [75]	Introduces a visual mapping of key BM components; clarifies value creation and delivery; early integration of sustainability concerns.	Limited explicit sustainability integration; does not fully address socio-environmental value or systemic change.	It enables NBT companies to gradually create, deliver, capture, and offer value aligned with the five principles of the UN Sustainable Development Goals (People, Planet, Prosperity, Partnership, and Peace), while remaining sensitive to their structural constraints.
Triple Bottom Line Canvas [76]	Embeds environmental, social, and economic dimensions; proposes a multi-layered perspective for sustainable value.	Focus on conceptual mapping; lacks operationalisation and implementation pathways.	The proposed ISBM is positioned as a bridging mechanism that supports firms in transitioning incrementally from existing business models towards more integrated, sustainable, and innovation-driven configurations.
SBM Archetypes [77,92]	Offer eight sustainability archetypes for redesigning BMs toward positive impact; emphasise value creation and reduced negative effects.	High-level categories; limited sector-specific guidance; implementation tools not fully developed.	Tthe framework conceptualises sustainability not only as a normative objective but also as a driver of competitiveness and resilience, even under conditions of limited initial capacity.
Bocken et al. [90]	Refine sustainability-oriented business model archetypes, showing how they support systematic value creation across environmental, social, and economic dimensions, particularly in tourism.	Limited by its largely conceptual approach, offering refined sustainability-oriented business model archetypes but little empirical validation, sector-specific differentiation, implementation guidance, performance measurement, dynamic analysis, or explicit consideration of SME constraints.	The framework conceptualises sustainability not only as a normative objective but also as a driver of competitiveness and resilience, even under conditions of limited initial capacity.
Ecologically Robust SBM [58]	Highlights environmental integrity and stakeholder expectations; defines principles for sustainable BM structuring.	Focuses more on conceptual design principles; lacks a roadmap for BM transformation.	Contributes by shifting BMs design from a static, idealised end-state to a process-oriented and context-sensitive model.
Sustainable Value Frameworks [83,86]	Define SBM as a tool for creating, delivering, and capturing sustainable value; include stakeholders beyond the firm's boundaries.	Conceptual definitions with limited practical tools; implementation challenges in SMEs and tourism.	It explicitly acknowledges the capability gaps and resource constraints faced by small and remote NBT firms
Tourism BM Innovation Approaches [4,6]	Suggest the transition from existing BMs to emerging tourism configurations; emphasise innovation and customer co-creation.	Tourism-specific innovation research still limited; lack of structured methodologies for NBT firms.	The proposed ISBM emphasises integrating environmental, socio-cultural, economic, and organisational dimensions with innovation processes, stakeholder engagement, and risk management.
BMI and BM Transformation Frameworks (Foss & Saebi, 2017; [11,60]**)**	Explain BMI as novel changes to BM components and architecture; focus on organisational redesign, strategy, and competitiveness.	Little alignment with sustainability goals; do not address environmental and socio-cultural dimensions explicitly.	It enables NBT companies to gradually create, deliver, capture, and offer value aligned with the five principles of the UN Sustainable Development Goals (People, Planet, Prosperity, Partnership, and Peace), while remaining sensitive to their structural constraints.
Lüdeke-Freund et al. [56]	Show how stakeholder value co-creation supports the development and scaling of sustainable business models, particularly in SMEs.	Limited by their predominantly conceptual focus on value co-creation, offering limited empirical evidence, sector-specific application, implementation guidance, and analysis of how SMEs manage resource constraints and dynamic business model evolution over time.	It strengthens the link between empirical evidence and theoretical development, addresses persistent gaps in tourism innovation research; aligns with adaptive and incremental innovation logics, offering a realistic pathway for firms to engage in value co-creation and sustainable transformation.

sustainability, followed by tools such as the Triple Bottom Line Canvas [76] and SBM approaches [77]. Integrating sustainability and innovation in business models enhances competitiveness, long-term viability [78], risk reduction, and resource efficiency [77], particularly benefiting small and remote tourism firms, including NBT [4,79].

Sustainable design within BMI transforms business models [48,80], reducing risks and strengthening strategic sustainability [81] and sustainable value [82]. Implementing sustainability requires business model adaptation [83] and supports SBM improvements [8,76]. Developing SBMs systematises dispersed knowledge [84] and fosters sustainability-oriented organisations [9,84,85]. SBMs help describe, manage, and communicate sustainable value creation and capture [86]. An SBM adopts a holistic view of how business is conducted in relation to stakeholders, including society and the natural environment [87]. SBM maximises benefits, while reducing economic, environmental and social impacts [88]. Nevertheless, scant research on SBM and Small and Medium enterprises (SMEs) exists [89]. Bocken et al. [90] reflect on the classification of sustainability archetypes, especially in tourism, and Lüdeke-Freund et al. [56] explore value co-creation in SMEs. However, gaps persist in SBM design [63,91] and in integration of sustainability [7,8], prompting proposals for ISBM [7,58]. This study extends existing research on SBM and BMI by advancing the concept of ISBM as a novel and theoretically relevant framework tailored to the specific characteristics of NBT firms. By linking prior literature with the sector's operational realities, including resource constraints, seasonality, dependence on natural capital, and value co-creation with local communities, the study moves SBM theory beyond generic applications and positions sustainability as both a strategic priority and a key condition for business resilience.

To synthesise the main frameworks discussed in the literature, Table 1 provides a simplified comparison of existing SBM approaches and highlights how the proposed ISBM builds upon them. This summary aims to clarify ISBM's distinctive contribution by contrasting its features with those of widely adopted SBM frameworks.

Table 1 reveals that existing SBM frameworks provide valuable foundations for embedding sustainability into business models, yet they exhibit notable limitations when applied to service-based sectors such as NBT. The Business Model Canvas [75] offers a practical visual tool but omits social and environmental dimensions. Boons and Lüdeke-Freund's (2013) principles introduce the sustainability conceptually, though they

lack operational guidance for implementation. Joyce and Paquin's [76] Triple Layered Canvas adopts a holistic approach but is often too complex for small firms and insufficiently oriented towards innovation. Similarly, Bocken et al.'s [77] circular economy archetypes prioritise manufacturing contexts, limiting their relevance for tourism services. The proposed ISBM does not claim to overcome all these limitations through a fundamental conceptual advance. Rather, it addresses them in different ways by combining operational clarity, sustainability integration, innovation orientation, and stakeholder engagement within a framework adapted to the realities of NBT firms. Its main contribution, particularly in relation to more established SBM frameworks, lies in its contextual specificity for the NBT sector, where small-scale, service--based, and often family-operated firms require practical guidance to align sustainability, innovation, and business model development with the UN Sustainable Development Goals.

ISBMs aim to create positive societal and environmental impacts through value-creation changes [92] and emphasise design principles, sustainable value, and reliability [53,63,84,93]. This study, therefore, conceptualises ISBM as a representation of the elements and their interrelations that an organisation uses to capture, create, and deliver value, explicitly incorporating innovation, nature conservation, sustainable economic growth, and societal benefits [5].

Advancing business model research in tourism [6], particularly for NBT and ISBM design [12], and exploring alternative management and innovation approaches [46], expands sustainability research across environmental, socio-cultural, and corporate dimensions [86,92,94].

3. Methodology

3.1. Research context

NBT encompasses diverse opportunities for development, both within natural areas and near nature and its surroundings [1]. It complements conventional bed-and-breakfast tourism by offering immersive experiences in rural settings, whether in protected or non-protected areas, that reconnect individuals with nature, fresh air, silence, landscapes, gastronomy, and local cultures [95]. Understanding NBT entrepreneurs' perceptions of sustainability and innovation is essential for developing ISBMs that foster competitiveness and ensure the long-term viability of NBT firms.

3.2. Methods

This section outlines the methodology used to collect data through an exploratory qualitative research design, complemented by an inductive approach to achieve the research objectives. By employing qualitative research, the study seeks to enhance authenticity, trustworthiness, and credibility [96].

A rigorous process guided the qualitative analysis, encompassing systematic data collection, interpretation, and reporting. To ensure accuracy, the authors applied validation procedures such as repeated listening to interviews, transcription and review, and triangulation with website data [97]. Narrative analysis, following Bryman [98], was used to explore how entrepreneurs perceive the importance of introducing sustainable and innovative management practices in NBT firms to secure competitive advantage and foster long-term businesses resilience.

The research followed a structured, multi-step approach. Mainland Portugal was divided into four regions (North, Centre, South, and Algarve) to ensure geographical representativeness. An initial inventory of NBT firms was compiled using publicly available records from licensing authorities; as of July 2025, the Instituto da Conservação da Natureza e das Florestas (ICNF) listed thirty certified firms, providing a credible sampling frame. Purposive sampling was then applied to select cases relevant to the research questions [98], focusing on firms offering NBT products and operating for at least five years. Selection further considered geographic distribution and website-based information, including types of experiences, location, innovation initiatives, sustainability commitments, and organisational longevity. This approach ensured analytical relevance and contextual diversity, supporting analytical generalisation and enabling assessment of transferability to other tourism contexts (Bryman, 2015). Relevant website data were systematically collected to capture variation in sustainability practices, innovation dynamics, and business model configurations within the NBT sector.

Table 2 presents the interviewees by activity.

This exercise identified thirty-one firms certified as NBT and forty-five offering NBT experiences in Portugal. All thirty-one firms certified as NBT in Portugal, as well as those offering NBT experiences, were invited to participate in the interview process. However, only one certified company, coded as E11, accepted the interview challenge. Among the firms offering NBT experiences, thirteen entrepreneurs responded positively to our request for an interview. The interviews were conducted during and after the COVID-19 pandemic, a period marked by temporary and permanent closures of many NBT businesses, which significantly reduced the available sample size. Entrepreneurs specialising in glamping, surfing, extreme activities, and wildlife tourism (e.g., hunting) did not respond to our solicitation. The final sample also included three public institutions related to tourism management and licensing, as well as an NGO. All participants provided informed consent prior to participation, and anonymity and confidentiality were ensured through coded identifiers and secure data handling procedures.

Seventeen semi-structured interviews were conducted: eleven face-to-face and six via videoconference, according to the interviewee's availability. Among the participants, ten were property owners, two were marketing managers, and one was a general manager. Table 3 summarises the interviewees by activity, location, gender, and number of employees. Six firms provided accommodation alongside NBT activities, either on-site or through partnerships with local operators. Two firms offered horse-riding experiences, with one also offering dolphin-watching tours. Another company offered nature walks, birdwatching, wine tourism, and guided walks. The NGO provided general nature-related activities focused on conservation. Regarding the three public institutions, one represented an association of tourism entrepreneurs, another was responsible for tourism in Portugal, and the third was accountable for biodiversity, nature conservation, and NBT certification.

The number of employees in the firms included in the study ranged from two to fifteen. Firms offering only NBT activities were typically smaller and often involved family members, with the owner also acting as an employee. The interviewees' ages ranged from thirty-five to sixty years; twelve (70.6%) were men, and five (29.4%) were women.

An interview guide was developed and organised to ensure data quality. Semi-structured interviews were employed to collect primary data, as they are considered flexible, allowing the interviewer to ask additional questions and elicit rich, detailed answers [98]. The interview questions (Annexe I) were aligned with the study's aim and covered the following topics: company characterisation, main markets for each company, and the role of sustainability and innovation in NBT firms' long-term business resilience and competitive advantage. At the end of each interview, interviewees were invited to discuss other topics not previously explored. Each interview lasted approximately 90 min. The semi-structured interviews were recorded and transcribed, allowing

Table 2
Interview participants by activity (Author's elaboration).

Interviewed Entities	*N*	%
NBT Certified Company	1	5.9
Other Companies offering NBT experiences/accommodation	12	70.6
Public Institutions	3	17.6
NGO	1	5.9

a systematic approach through coding [98]. A narrative analysis, following Bryman [98], focused on how entrepreneurs recognised the importance of introducing a sustainable and innovative management model in NBT firms to achieve competitive advantage and promote long-term businesses resilience. The interviews' responses enabled us to identify how NBT firms' business models deviated from an ideal ISBM. Furthermore, the narrative analysis allowed us to understand different perceptions among respondents from NBT firms, public entities, and the NGO. The sample size of seventeen interviews was considered sufficient as data saturation was reached, and no new themes emerged after the final interviews.

4. Results

The seventeen semi-structured interviews provided essential information and guided the narrative analysis of the collected contents. The interviewees commented on the key drivers of an ISBM: sustainability, innovation, long-term business resilience, and competitive advantage in NBT businesses. However, the narrative analysis was conducted separately as NBT entrepreneurs, the NGO, and public institutions held distinct perspectives on these subjects. In this section, the interviewees' contributions are summarised in Table 4.

Table 3
Profile of interviewees by activity, location, and number of employees (Author's elaboration).

Entrepreneurs/ Entities	Activity	Region	Employees
E01	Accommodation- nature experiences; sustainable tourism	Centre	8
E02	Horseback Riding on the beach	South	4
E03	Horseback Riding on the beach and other natural areas	South	3
E04	Whale and dolphin watching; Heritage visits	South	5
E05	Accommodation- nature experiences	Centre	4
E06	Hiking in nature; gastronomic and wine experiences; religious tourism	North	3
E07	Bird watching	Centre	4
E08	Accommodation; nature experiences; gastronomic and wine experiences	North	4
E09	Accommodation nature experiences; sustainable tourism	Centre	5
E10	Accommodation; nature experiences; gastronomic and wine experiences; sustainable tourism	South	15
E11	Accommodation; nature experiences; gastronomic and wine experiences; sustainable tourism; environmental education	South	2
E12	Accommodation; nature experiences; gastronomic and wine experiences; sustainable tourism; environmental education; nature conservation	Centre	10
E13	Pedestrian walks- geology observation; nature experiences	South	2
E14	ONG-Nature conservation, landscape and territory planning	North	>10
E15	Public Institution- Tourism Management	Lisbon	>30
E16	Public Institution - Tourism Management	Lisbon	>100
E17	Public Institution - Nature management; Biodiversity conservation	Lisbon	>1000

5. Discussion

The study analysed the perceptions of NBT entrepreneurs, public institutions, and NGOs regarding the relevance of sustainability and innovation in NBT business models. The analysis was supported by relevant literature and semi-structured interviews with managers from NBT firms, public institutions, and one NGO. The study addresses two research objectives: (i) to understand NBT entrepreneurs' views on sustainability, innovation, competitive advantage, and long-term resilient business in their business models; and (ii) to propose an I for NBT firms. The analysis focused on four drivers: sustainability, innovation, competitive advantage, and long-term resilient business in NBT (Table 5).

NBT is highly dependent on natural capital [14,39]. The findings confirm that entrepreneurs recognise the importance of environmental sustainability. However, a persistent gap remains between sustainability discourse and practice [25,28,29]. Although environmental practices are widely adopted, often driven by regulatory requirements, the social and economic dimensions of sustainability remain underdeveloped. This fragmented approach challenges the multidimensional understanding of sustainable tourism discussed in Section 2.1 [30,31], where sustainability is not yet a strategic driver of business models but is mainly treated as a compliance issue.

The findings show that NBT firms often have weakly structured or implicit business models. This supports previous research on SMEs' managerial and structural limitations [4,11]. The lack of integration across activities limits value creation and capture [56]. NBT firms also show limited innovation, consistent with literature describing tourism as a low-innovation sector [72,73]. Innovation tends to be incremental and is informally driven by personal motivations rather than market needs. This contrasts with innovation theory, which focuses on solving customer problems and strategic intent [99]. Sustainability and resilience in NBT business models are crucial for business performance anviability [39,58,100–103].

These findings extend the BMI literature by showing that innovation in NBT is limited by resource constraints, lifestyle entrepreneurship, and strong place attachment [62,79]. While BMI is often seen as a key driver of competitiveness (Foss & Saebi, 2017; [64]), this study finds that innovation alone does not lead to sustained competitive advantage without structured approaches and market orientation [4,104]. This helps explain why public institutions and NGOs describe NBT firms as "alternative and inconsistent businesses with high mortality rates".

The interviewed entrepreneurs expressed a strong personal interest in their field of activity, primarily viewing it as a source of income. However, these firms demonstrated limited innovation, suggesting their competitive advantage may be at risk. This view was echoed by public institutions and NGOs, who observed: "NBT entrepreneurs are opportunistic, leaving mostly on the fleeting and following the trend."

Regarding sustainability, environmental regulations compel NBT firms to adopt ecological practices. The findings confirm that entrepreneurs prioritise environmental sustainability, while significant gaps persist in socio-cultural and economic dimensions. Although sustainability and resilience in NBT business models are known to improve business performance [39,58,102,103] and support long-term viability [100,101]. NBT entrepreneurs demonstrate a limited understanding of sustainability as a holistic concept. In particular, the economic dimension is narrowly interpreted as "paying salaries, taxes, and rents." This reductionist view undermines long-term viability and resilience [19], as also confirmed by public institutions and NGOs.

The study also offers empirical support for the need for an ISBM, as discussed in Section 2.2. The findings show that NBT firms inherently operate at the intersection of environmental stewardship, local development, and economic survival, yet lack the capability to integrate these dimensions into a coherent business logic. This confirms existing gaps in sustainable business model design and implementation [63,91] and highlights the need for more context-specific and operational

Table 4
Summary of the interview results: NBT entrepreneurs, public institutions, and the NGO (author's elaboration).

Entity	Sustainability Dimension	Global perspective	Interviewees comments
NBT entrepreneurs	Sustainability	Environmental perspective, emphasising nature conservation	"…nature is fundamental, we manage to maintain, look after, take care of all the environment, nature supports our activity"
	Innovation	Vital to NBT's performance, offering personalised services and adopting international best practices	"Innovation is what makes us stay ahead of the competition, through promotion and the products we create, also regarding the quality of the service we provide", "using the best practices that are used abroad, being as up-to-date as possible."
	Long-term and resilient businesses	Committed to developing long-term and resilient businesses, taking advantage of the country's unique characteristics	"That's the most important thing, running the business for as long as we can"; "For me, the keyword is resilience, there is no doubt about it".
	Competitive advantage	NBT a competitive sector favouring authentic experiences and high-quality services:	"to be honest, the simplest things, they don't have to be exuberant, they don't have to be spectacular, it is what best identifies us from other regions", "what we do here is to remain true to ourselves, to remain faithful to the identity of the Saloia[1] region and to provide a quality experience regarding living conditions and service", "the recovery of the heritage that we did here, the service we offer and the quality of the landscape and services, these are the three main differentiators, I think these are the reasons for our success".
Public institutions and NGO	Sustainability	NBT entrepreneurs ignore their impact on nature, urging them to integrate economic, environmental, and social initiatives:	"NBT firms should be sensitive, to introduce environmental, economic and social measures, which are not evident", "NBT should preserve natural resources", "NBT entrepreneurs must notice a direct impact of their activity on natural values when we show them numbers".
	Innovation	Associate innovation mainly with technology and claiming that NBT entrepreneurs lack digital skills	"Entrepreneurs in NBT businesses are behind time regarding innovation", "some firms incorporate what others develop"; "If firms cannot innovate and cannot create their innovation, they cannot project themself, and sell NBT products", "firms do not have people with digital skills."
	Long-term and resilient business	Inconsistent business with a high failure rate, lacking business models and entrepreneurs' opportunistic behaviour	"a small fraction that makes this (NBT) a minimally consistent business", "NBT complementary to another activity", "the majority are bad businessmen", "some entrepreneurs get into this business because they see no alternative", "we must have entrepreneurs who know and have the direction of their business plan", "we live too much on the fleeting, too much on the short term", "we have many investments made in tourism by people without a tourism background", and I think this may bring us some unpleasantness in the future".
	Competitive advantage	Recognise Portugal's assets, such as climate, beaches, friendliness, gastronomy and size, but argue Portugal is not a competitive NBT destination due to small family businesses and entrepreneurs with limited qualifications	"Almost 99% of our tourism firms are micro and small businesses and are managed by family members and youngers"; "They do not have a professional structure, nor can they because they are micro and do not have a structure to support them"; "lack of entrepreneurs' training, reflected in how they deal with employees, with salaries, with management, in the way they incorporate technology and innovation".

[1] It means country inhabitant, as opposed to city inhabitant, and originally referred to the rustics of the Lisbon area.

frameworks.

Building on these insights, the study identifies four interrelated drivers: sustainability, innovation, competitive advantage, and long-term business resilience as the core pillars of an ISBM for NBT firms, as show in Fig. 1. This contribution advances the theoretical framework by operationalising sustainable business model principles within a specific sectoral context.

Integrating the environmental, economic, socio-cultural, and corporate dimensions of sustainability with design, technology, communication, and risk-reduction strategies is essential for enhancing business performance through innovation [5]. It further strengthens firms' competitive advantage by supporting product quality, service excellence, knowledge development, and strong stakeholder relationships, all of which are essential to business resilience. Together, sustainability, innovation, competitive advantage, and resilience form the foundation of the ISBM, demonstrating how their interaction contributes to a robust, adaptive business model.

Success, however, depends on the ability to understand and navigate the business environment effectively, as it requires accommodating multiple interrelated factors [105].

Innovative solutions are inherently linked to addressing consumer needs and solving customer problems [99]. Accordingly, firms must clearly identify the problem they aim to solve, determine how they will address it, and define their target audience when innovating [99]. However, the findings reveal that entrepreneurs are primarily motivated by personal interests rather than market needs. Many invest in businesses connected to inherited family property or personal passions, such as birdwatching, dolphin and whale watching, or geology. In this sense, NBT is often perceived as both a source of income and an opportunity to invest outside urban centres. Nevertheless, successful innovative solutions are typically designed to address specific customer needs and are supported by significant R&D investment, which contributes to improved business performance [106].

The findings further indicate that NBT firms show limited initiative in integrating innovation and sustainability into their business models. Although they prioritise economic sustainability and seek to demonstrate ecological commitment, largely in response to legal requirements, they should broaden their focus to include social sustainability while also strengthening both environmental and economic performance [5]. The environmental orientation was clearly reflected in the interviews, where entrepreneurs repeatedly associated the viability of their businesses with the conservation of nature: "Nature is the great golden goose; it is about being able to maintain, look after, and take care of all this environmental part, which supports our activity" ([7], p.5). Another interviewee similarly stated that "the conservation of natural resources is essential; it is fundamental because these resources sustain the

Table 5
Perceptions of entrepreneurs, the NGO, and public institutions (Author's elaboration).

Perceptions of Entrepreneurs, NGO, and Public Institutions		
	Entrepreneurs	NGO and Public Institutions
Sustainability	Particularly focused on the environmental dimension Taking care of nature NBT as a nature sponsor/ carer Preserving natural resources NBT to promote local products NBT preserving local culture NBT enhancing local economy and regional development	NBT companies should introduce economic, environmental, and social measures •Entrepreneurs do not realise about their impacts in nature NBT provides higher salaries Limited entrepreneurs' qualifications impacting sustainability of NTB business Lack of strategy
Innovation	Providing distinct services Customised approach Using APP in NBT experiences (using existent APP) Finding creative solutions •Adopting the best practices used abroad	Entrepreneurs use PC and internet connection (technology) Companies unable to implement innovation Entrepreneurs behind time in terms of innovation Companies incorporate what others develop Entrepreneurs do not have digital skills Public institutions helping tourism companies on digitalisation
Long-term Business/ Resilience	Offering quality and exceptional products Profiting from the exceptional characteristics of our country Long-term decisions Being resilient Committed with a business for life	Inconsistent business NBT an alternative business Entrepreneurs living on the fleeting Opportunistic entrepreneurs following the trend Companies not prepared to develop/adopt a BM NBT companies with high mortality rate
Competitive advantage	Providing highly differentiated products Making things simple Increasing tourist's experience Short-distance interesting places Quality of the services NBT in Protected Areas Keeping Portuguese authenticity	Portugal is not a competitive NBT destination Friendly people, beaches, climate and country size Portugal is competitive in equestrian tourism, and bird watching Limitations due to companies' dimension and structure Limitations due to lack of entrepreneur's qualifications

activity; if there are no resources, we would not be selling tours because tourists would not be visiting anything" ([7], p.5). These excerpts show that environmental sustainability is recognised as central to business continuity, though it is still often framed primarily in terms of conservation, resource protection, and operational responsibility.

Developing an ISBM for NBT firms, therefore, requires adapting and modifying existing business models [83]. Although such changes increase complexity, they enable the creation of new business models that integrate innovation and sustainability, recognise the importance of stakeholders, and incorporate customer considerations at every stage [6].

Adapting and transforming business models is thus essential for improving performance and achieving ISBM in NBT firms [83]. ISBMs address customer problems, implement innovative solutions [99], and support the development of business models that integrate sustainability, innovation, and stakeholder engagement throughout all stages [6]. At the same time, firms should deepen their understanding of sustainability and related economic principles, while investing in training that helps professionals deliver higher-quality, more personalised experiences. This approach creates a comparative advantage over lower-priced alternatives by combining quality with continuous innovation [107].

Addressing the gap in tourism literature on business sustainability and business models [6], this study proposes an ISBM framework tailored specifically for NBT firms, contributing to an emerging area of research [108].

The proposed ISBM framework emerges directly from these interview findings, summarized on Table 5.

First, NBT entrepreneurs perceive sustainability mainly from an environmental perspective, emphasising nature conservation as essential to business continuity, since "nature is fundamental" and firms must "maintain, look after; they take care of all the environment," because "nature supports our activity". Public institutions and the NGO, on the other hand, perceive NBT firms as needing greater awareness and evidence-based guidance to integrate sustainability more holistically, arguing that "NBT firms should be sensitive, to introduce environmental, economic and social measures, which are not evident," that "NBT should preserve natural resources," and that entrepreneurs often recognise the "direct impact of their activity on natural values" only "when we show them numbers."

Second, entrepreneurs perceive innovation, long-term business resilience, and competitive advantage as closely linked to the capacity of NBT firms to provide high-quality, personalised, and authentic experiences, arguing that "innovation is what makes us stay ahead of the competition" through promotion, product development, and service quality, while also stressing the importance of adopting "the best practices that are used abroad," sustaining the business over time "running the business for as long as we can" and building competitiveness around local identity, heritage, landscape quality, and simplicity, since "the simplest things" are often what best differentiate one region from another. However, public institutions and the NGO perceive innovation, long-term business resilience, and competitive advantage in NBT as constrained by weak digital and managerial capabilities, noting that "entrepreneurs in NBT businesses are behind time regarding innovation" and that "firms do not have people with digital skills," while also stressing that many businesses remain fragile and short-term oriented because only "a small fraction" become "minimally consistent," many operate as "NBT complementary to another activity," and the sector is dominated by micro and family firms that "do not have a professional structure," with a "lack of entrepreneurs' training" limiting their ability to incorporate technology, innovation, and strategic management despite Portugal's natural and cultural assets.

Together, these contrasting perceptions suggest that the proposed ISBM framework should operate as a bridging mechanism, translating entrepreneurs' place-based environmental commitments and experiential knowledge into a more holistic, evidence-based, market-oriented, and capability-enhancing model. In doing so, the framework can strengthen sustainability, innovation, resilience, and competitiveness within NBT firms. These empirical insights directly inform the structure of the proposed ISBM, with each pillar reflecting specific capability gaps and strategic opportunities identified through the interview data.

The proposed framework builds on the models of Osterwalder and Pigneur (2010) and Bocken et al. [77], drawing on the Business Model Canvas and the value mapping tool for sustainable business models. It enables NBT firms to create, deliver, capture, and offer value aligned with the five principles of the UN Sustainable Development Goals-the 5Ps: People, Planet, Prosperity, Partnership, and Peace, while simultaneously meeting consumer requirements, as shown in Fig. 2.

Crucially, rather than assuming the existence of advanced sustainability and innovation capabilities, the framework is conceptualised as a transitional and capability-building model that explicitly responds to the

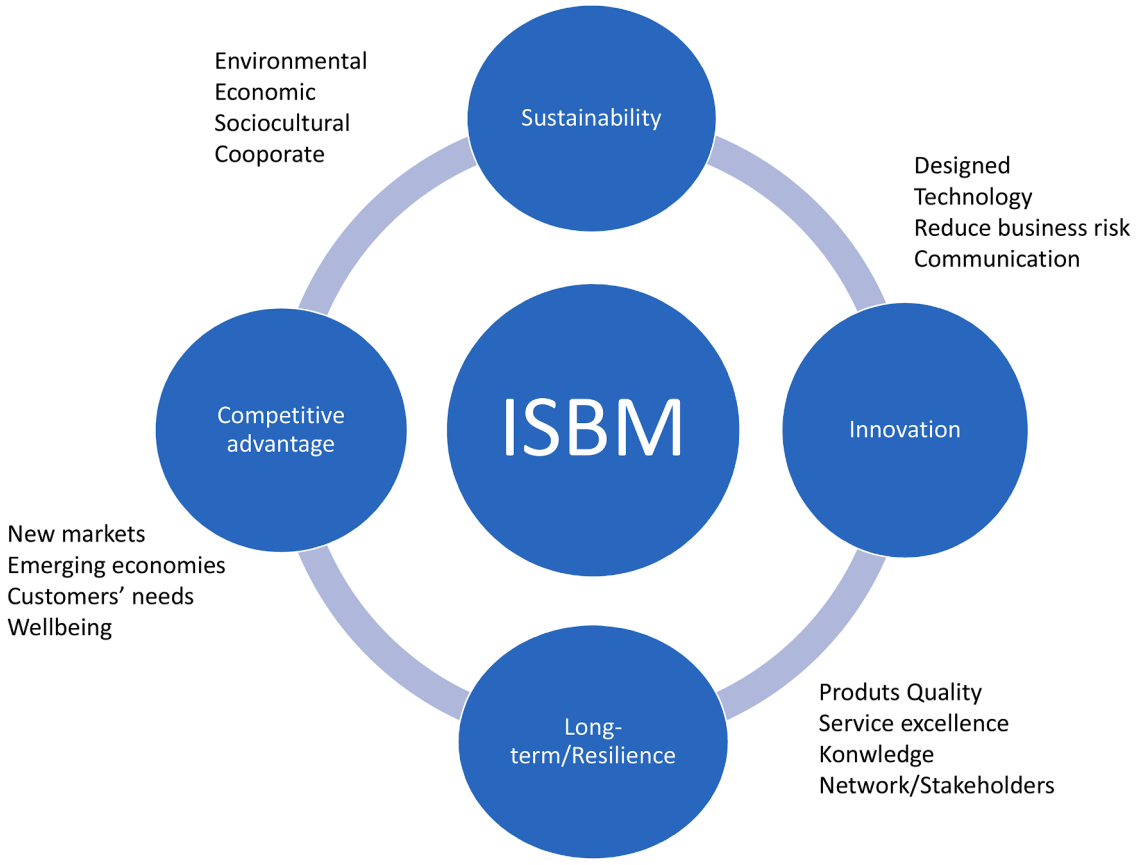


Fig. 1. Drivers of an ISBM [2] **(Author's elaboration).**

empirical realities identified in this study.

The interview findings reveal that NBT entrepreneurs often display a limited and environmentally narrow understanding of sustainability, alongside constrained digital skills and innovation capacity [7]. This gap between current practices and ideal SBM is not seen as a weakness of the framework, but as its starting point. The proposed ISBM therefore acts as a bridge, helping firms gradually move from existing business models towards more integrated, sustainable, and innovation-oriented configurations.

From a theoretical perspective, this approach contributes by shifting ISBM design from a static, idealised end-state to a process-oriented and context-sensitive model. In doing so, it addresses the lack of operationalisation of sustainability in business models identified in prior literature [8,63,88,89,91], while responding to calls for embedding ecological and social value creation [56,73,80,86]. Importantly, it explicitly acknowledges the capability gaps and resource constraints faced by small and remote NBT firms.

Furthermore, drawing on business model innovation (BMI) research [58,64,70], the framework conceptualises sustainability not only as a normative objective but also as a driver of competitiveness and resilience, even under conditions of limited initial capacity. This perspective aligns with adaptive and incremental innovation logics, offering a realistic pathway for firms to engage in value co-creation and sustainable transformation.

Overall, the proposed ISBM advances the literature by delivering a holistic, operational, and transition-oriented framework tailored to the specific context of NBT firms. It strengthens the link between empirical evidence and theoretical development, addresses persistent gaps in tourism innovation research [72,73], and contributes to the design of ISBMs in contexts characterised by limited transformation capacity. Table 5 further illustrates the perceptions of entrepreneurs, the NGO, and public institutions, which served as the basis for the proposed framework, thereby reinforcing the study's coherence and analytical contribution.

In contrast to generic SBM approaches, the proposed ISBM aligns with the principles of the circular economy, reducing environmental impacts and resource scarcity while enhancing human well-being and social equity [109]. It integrates organisational dimensions with innovation processes, stakeholder engagement, and risk management.

This integrated perspective responds directly to calls in the literature for more holistic and practically applicable business model frameworks [6,58].

Moreover, the findings indicate that NBT entrepreneurs are primarily motivated by personal interests and lifestyle considerations rather than market-driven innovation [7]. While this aligns with prior research on rural and lifestyle entrepreneurship, it also reveals a critical limitation: the misalignment between value propositions and customer needs. As emphasised in innovation theory [99], effective business models require a clear identification of customer problems and the development of targeted solutions. The absence of such market orientation constrains innovation outcomes and limits competitiveness [7].

The transition towards an ISBM is likely to be gradual, particularly because many NBT firms are small, family-owned businesses managed by owners with limited formal business training. In the early stages, firms are likely to focus on basic actions, such as identifying their existing environmental and social practices, understanding customer needs, and clarifying their value proposition. These initial steps may then be followed by the gradual development of core capabilities, including business planning, digital communication, sustainability awareness, and customer experience design, often with support from local institutions and partnerships. More advanced forms of innovation, such as structured collaboration, digitalisation, co-created experiences, and sustainability monitoring, are likely to emerge only once these foundational elements are in place.

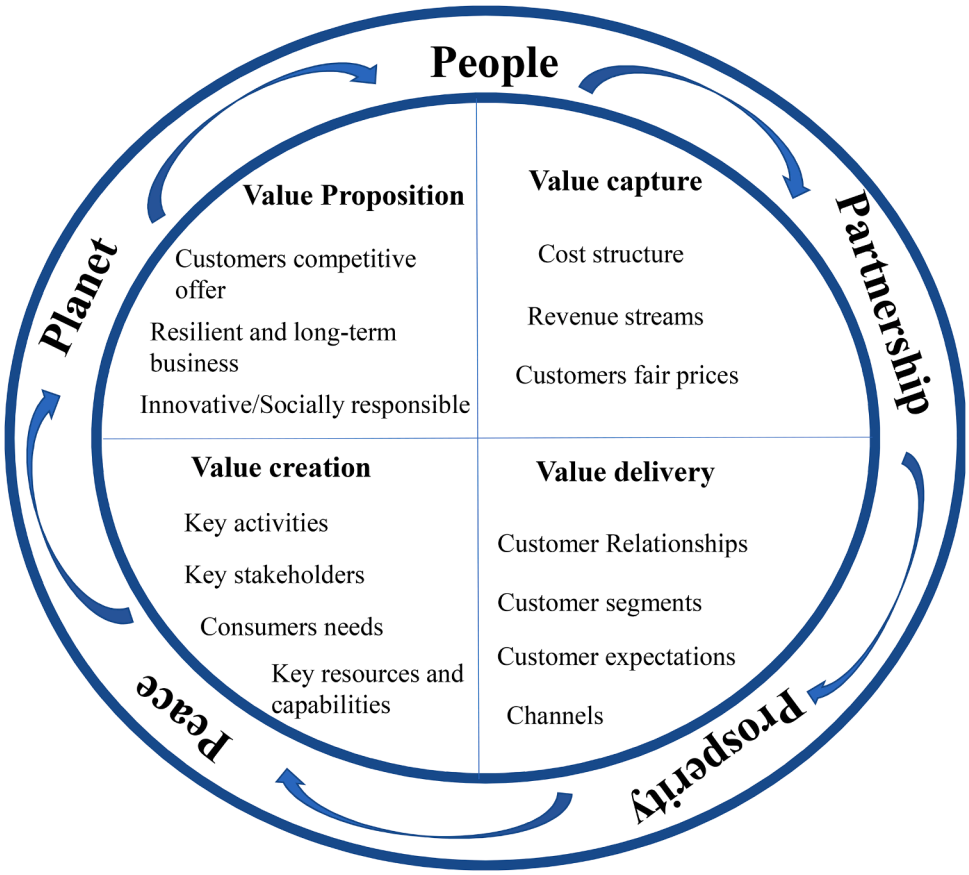


Fig. 2. Proposed ISBM framework for NBT firms (Author's elaboration).

5.1. Limitations

One limitation of this research concerns access to information and the participation of NBT entrepreneurs. The study did not include entrepreneurs offering glamping, surfing, extreme activities, or wildlife tourism such as hunting. Including these firms would have broadened the scope and enriched the findings.

The study identified NBT firms managed by small teams with limited business management skills and minimal commitment to sustainability. Understanding business models enables comparisons, assessment of sustainability potential, and consolidation of knowledge on SBM patterns to develop an overarching SMB structure [56,90,110]. However, securing participation from NBT managers was challenging, which may explain fragmented knowledge in this sector, particularly regarding innovation, business constraints, and economic impacts [17,88].

This limitation highlights the difficulty of conducting research in this area and contributes to the absence of an adequate SBM design addressing all dimensions of sustainability [17,1] and the lack of access to primary data on business models for NBT [88,111].

6. Conclusions

This study examines the role of sustainability and innovation within the business models of NBT firms, highlighting structural limitations that affect their competitiveness and long-term viability. The findings show that NBT entrepreneurs predominantly focus on environmental sustainability, largely driven by regulatory requirements, while socio-cultural and economic dimensions remain underdeveloped. The economic dimension is narrowly interpreted, often limited to basic financial obligations such as paying salaries, taxes, and operational costs. This fragmented understanding of sustainability reveals a persistent gap between theoretical frameworks and business practice, pointing to an incomplete and imbalanced integration of sustainability within NBT business models, especially in small, family-owned firms. Moreover, the study reveals that many NBT firms operate with limited managerial capabilities and lack the knowledge and skills required to adopt innovative and sustainable business practices. This constraint is especially evident in small teams and family-owned firms, where innovation is typically incremental and driven by personal motivations rather than strategic or market-oriented approaches. As a result, business models often fail to integrate sustainability and innovation coherently, thereby compromising value creation, competitiveness, and resilience. Most firms "lacked the knowledge and skills required to adopt innovative proposals," further reinforcing these limitations.

This deficiency significantly constrains the adoption of sustainable practices and undermines competitiveness, resilience, and long-term viability [3,8,11,57,61]. It is therefore recommended that tourism entrepreneurs strengthen "their skills and knowledge before establishing their businesses" [112]. Weakly innovative businesses tend to be less sustainable [81,83], as they are often characterised by limited value creation and delivery [82]. Overall, NBT firms' business models fail to meet the basic requirements of ISBMs [9,58,70,77,78].

From a managerial and policy perspective, the proposed ISBM framework offers practical guidance for improving the performance and long-term viability of NBT firms. It supports integrating sustainability and innovation into business strategies, enhances competitiveness, and contributes to achieving the Sustainable Development Goals and the 2030 Agenda. Additionally, the findings identify critical areas for intervention, including gaps in management training, limited adoption of digital technologies, weak innovation capacity, and a fragmented understanding of sustainability. These insights are particularly relevant for public institutions and NGOs when designing governance strategies,

training programmes, regional planning initiatives, and population settlement policies.

From a research perspective, the study contributes at three levels. First, it captures the perceptions of NBT managers, public institutions, and NGOs regarding sustainability, innovation, long-term viability, resilience, and competitive advantage. Second, it characterises the business models of Portuguese NBT firms and assesses their alignment with sustainable development principles and ISBM requirements. Third, it develops and proposes an ISBM framework tailored to NBT's specific context.

Based on these findings, it is recommended that targeted training programmes be developed to bridge existing knowledge gaps among NBT entrepreneurs and strengthen business sustainability. The results can also support public institutions and local organisations in defining governance strategies aligned with sectoral sustainability policies, regional planning, and land-use frameworks, complemented by capacity-building initiatives. Furthermore, it is advisable to identify NBT firms willing to implement and test the proposed ISBM to validate its effectiveness and assess its contribution to improving business sustainability. This study underscores the importance of capacity-building initiatives to address knowledge gaps among NBT entrepreneurs.

Finally, the study highlights that successful ISBM implementation depends on firms' ability to understand and navigate complex business environments, integrating multiple internal and external factors [105]. This includes strengthening managerial capabilities, enhancing stakeholder networks, aligning business strategies with market needs, and investing in knowledge and training. Through these improvements, NBT firms can transition from fragmented practices to fully integrated business models that support sustainability, innovation, competitiveness, and long-term business resilience. By aligning empirical findings with theoretical insights, this study helps bridge the gap between sustainability theory and business practice in the NBT sector, reinforcing the importance of integrated, context-sensitive business model approaches.

Overall, by explicitly linking empirical findings to the theoretical foundations of NBT and SBM, this study helps bridge the gap between conceptual models and real-world practice, reinforcing both the academic relevance and practical applicability of the ISBM approach.

6.1. *Future research*

Further research could explore how sustainability and innovation in NBT firms influence tourists' choices. It should also strengthen collaboration between academia and entrepreneurs to support innovation and sustainability in business practices. Future studies could focus on (i) adapting business models to national contexts and the needs of sustainability-driven firms; (ii) promoting experimentation with innovative and sustainable business models in NBT firms; and (iii) developing new approaches to IBM, emphasising process innovation rather than product innovation.

Research should also examine NBT firms in other countries and continents to determine whether weaknesses and limitations are geographically restricted. Another priority is designing and evaluating training programs for NBT entrepreneurs, tour operators, stakeholders, and local communities to improve sustainability awareness. Studies could further explore business models for community-based tourism, capacity-building, and the equitable distribution of economic benefits. Finally, testing the proposed IS in NBT firms and across other tourism sectors would be valuable for assessing its effectiveness and contribution to the Sustainable Development Goals and sustainable tourism. Future research should focus on supporting the practical implementation of ISBM principles and testing the framework across different contexts to evaluate its applicability and impact.

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CRediT authorship contribution statement

Cristina Abreu: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Catarina Marques:** Writing – review & editing, Validation, Supervision, Methodology. **Hélia Gonçalves Pereira:** Writing – review & editing, Validation, Supervision, Methodology.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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