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Virtual reality in tourism and sustainable community development: A decolonial governance framework

Pola Qi Wang 

School of Hospitality and Tourism, Auckland University of Technology, Auckland, New Zealand

ABSTRACT

Although Virtual reality (VR) is increasingly used in tourism, its role in sustainable community development remains insufficiently theorized. Through a conceptual synthesis of literature on VR tourism, sustainable community development, digital sustainability, tourism imaginaries, and decolonial tourism, this paper develops a community centered VR sustainability framework. The framework examines how VR may support economic resilience, cultural preservation, social inclusion, and community authority in tourism contexts. Rather than treating VR as a self-evident solution or simply as a substitute for physical travel, the paper argues that its community value depends on how VR initiatives are designed, governed, owned, and distributed. The framework positions VR tourism functions as conditional pathways rather than automatic benefits. Without these conditions, VR may reproduce economic leakage, cultural commodification, digital exclusion, platform dependency, and outsider-controlled representation. Through a decolonial lens, the paper reframes VR tourism as a question of community authority rather than technological novelty.

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Introduction

Tourism has long been recognized as an important pathway for community development because it can support employment, local enterprise, cultural exchange, and heritage protection. The United Nations World Tourism Organization (2023) links tourism to sustainable development through its potential to create economic opportunities while supporting social and environmental goals. World Travel and Tourism Council (2022) also highlights tourism's role in employment generation and economic recovery. Yet tourism's developmental value is not automatic. Tourism growth can create pressure on local environments, intensify dependency on visitor markets, and produce uneven benefits for host communities. Bramwell and Lane (2011) claim that tourism sustainability must be understood through governance, power, and long-term community interests rather than growth alone. This is particularly important for communities that rely heavily on physical visitation and external tourism demand.

CONTACT Pola Qi Wang  pola.wang@aut.ac.nz  School of Hospitality and Tourism, Auckland University of Technology, Auckland, New Zealand

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Community based tourism has attempted to address these concerns by placing local participation and benefit sharing at the center of tourism development. Lee and Jan (2019) show that community-based tourism can support sustainable development when residents perceive benefits across economic, socio cultural, and environmental dimensions. Manyara and Jones (2007) also emphasize the potential of community-based tourism enterprises to support local livelihoods, although their work shows that such benefits depend on appropriate structures and local capacity. These studies suggest that tourism contributes to community development only when communities have meaningful involvement in decision making and when benefits are distributed fairly. The key question is therefore not simply whether tourism can support communities, but under what conditions tourism development strengthens local resilience, cultural integrity, and community control.

This question becomes more complex in digital tourism. Virtual reality (VR) has become increasingly visible in tourism as a technology that allows users to experience simulated environments through immersion, interaction, and a sense of presence. Guttentag (2010) identifies VR as a technology with significant implications for tourism because it can simulate destinations, attractions, and experiences without requiring physical travel. In tourism research, VR has been widely examined in relation to destination marketing, pretravel experience, destination image, visit intention, and tourist engagement. Tussyadiah et al. (2018) demonstrate that the sense of presence created by VR can shape tourists' attitudes toward destinations. Loureiro et al. (2020) similarly position VR and augmented reality as technologies that can enhance travel experiences and destination marketing. This body of research has established the value of VR for tourist experience and promotional purposes.

Less attention has been given to VR's role in sustainable community development. Existing studies tend to focus on what VR does for tourists or destinations rather than what VR does for communities. This distinction is important. A VR experience may increase destination awareness or user engagement, but this does not mean that local communities control the representation, receive economic benefits, or participate in the design of the digital product. Loureiro et al. (2020) argues that research on VR and augmented reality in tourism has grown in the recent years, yet the field remains largely shaped by experience, technology adoption, and consumer response concerns. What remains less clear is how VR can function as a community centered tool for economic resilience, cultural preservation, social inclusion, and local governance. The issue is especially important when VR is used to represent cultural heritage and community identity. Bec et al. (2019) discuss immersive heritage tourism experiences and show that such technologies can support heritage interpretation and visitor engagement. Heritage representation also raises questions about ownership, authenticity, cultural authority, and control over narrative. Heritage conservation in the digital age requires careful attention to how heritage is produced, managed, and valued through digital systems. From this perspective, VR should not be treated only as a neutral medium for presenting destinations. It can also become a form of digital infrastructure through which communities are represented, interpreted, and potentially commercialized.

Decolonial tourism perspectives are therefore central to the argument. Hollinshead et al. (2021) further call for decolonizing tourism studies through deeper listening, rethinking, and attention to unequal knowledge relations. These arguments are highly

relevant to VR because immersive technologies do not automatically empower communities. VR can support community storytelling when local people control the content, cultural framing, and benefits. It can also reproduce extractive forms of tourism when external actors design, own, and monetize digital representations of local culture without meaningful community authority. The decolonial question is therefore not whether VR is innovative, but who has the power to represent, interpret, and benefit from the virtual tourism experience.

In response to this gap, the study develops a conceptual framework for understanding VR as a possible catalyst for sustainable community development in tourism contexts. Rather than treating VR as a self-evident solution, the framework examines the mechanisms through which VR is designed, governed, owned, and distributed. Experience economy theory explains how VR can create immersive and memorable forms of engagement (Pine & Gilmore, 1999). Digital sustainability provides a lens for considering how digital tools may support more resilient and less resource intensive forms of tourism engagement. Decolonial tourism perspectives examine power, representation, cultural sovereignty, and the risk of digital extraction. Together, these perspectives allow the framework to assess both the promise and the limitations of VR for community development. Greater clarity is also needed about the different functions of VR in tourism. VR may be used for destination marketing, heritage interpretation, virtual access, immersive education, cultural storytelling, participatory planning, crisis related digital engagement, and digital value creation. These functions are not the same and they do not produce the same community outcomes. To address this issue, the literature review presents a table that distinguishes key VR applications, their tourism use, their possible relevance to community development, and their limitations. This avoids treating VR as a single, uniform technology and provides a clearer basis for analyzing its potential community value.

The conceptual analysis is guided by three research questions:

- (1) Through what mechanisms can VR support sustainable community development in tourism contexts?
- (2) What conditions are necessary for VR initiatives to benefit local communities rather than external platform owners or tourism intermediaries?
- (3) How can experience economy, digital sustainability, and decolonial perspectives inform a community centered VR tourism framework?

These questions are addressed through three linked conceptual arguments. First, VR should not be understood only as a substitute for physical travel or as a promotional tool for destinations. It can also operate as digital community infrastructure when used to support local storytelling, cultural preservation, education, and participation. This argument responds to the first research question by identifying the mechanisms through which VR may support sustainable community development, including digital storytelling, virtual heritage access, immersive education, participatory planning, and community led digital products. Second, VR contributes to sustainable community development only when communities have authority over design, ownership, governance, and benefit sharing. This addresses the second research question by identifying the conditions required for VR initiatives to benefit local communities rather than external platform owners or tourism intermediaries. Third, a community centered VR framework must

consider both potential benefits and risks, including cultural commodification, digital exclusion, platform dependency, economic leakage, and outsider-controlled representation. This addresses the third research question by integrating experience economy theory, digital sustainability, and decolonial tourism into a framework that assesses VR as both an immersive experience and a governed system of representation, ownership, and community value. The study contributes to sustainable tourism, digital sustainability, decolonial tourism, and community development scholarship by offering a framework for assessing how VR can be designed and governed in ways that support local resilience and cultural integrity.

Literature review

VR in tourism: Definitions, applications, and limitations

VR refers to a computer-generated simulation that allows users to experience and interact with a three-dimensional digital environment. Guttentag (2010) explains that VR is valuable for tourism because it allows users to experience computer-generated representations of places, attractions, and activities from a distance. Unlike photographs, videos, or websites, VR places users inside a simulated environment and allows them to engage with the setting through a stronger sense of presence. Slater and Sanchez-Vives (2016) explain that presence is central to immersive VR because it creates the feeling of being located within a virtual setting. In tourism, this makes VR more than a visual medium. It becomes an experiential technology through which users can explore, imagine, and emotionally respond to places.

The tourism literature has mainly examined VR in relation to experience design, destination promotion, memorable engagement, and tourist decision making. Loureiro et al. (2020) discuss VR and augmented reality as technologies that can enhance travel experiences such as mobilities and multisensory phenomena, while Tussyadiah et al. (2018) show that VR presence can influence tourist attitudes toward destinations. VR also became more visible during and after the COVID 19 pandemic, when destinations needed alternative ways to maintain engagement while physical travel was restricted. Godovykh et al. (2022) describe VR tourism as a response to the pandemic context and call for further attention to virtual tourism experiences in the post pandemic period. In addition, Jorge et al. (2023) consider whether VR can create memorable tourist experiences and influence future intentions in wine tourism. Together, these studies show that VR has clear value for tourist engagement, destination visibility, and future travel interest. However, they also reveal a continuing tourist centered emphasis. A virtual experience may keep a destination in the public imagination or strengthen emotional connection to place, but this does not necessarily mean that local residents receive income, control digital content, or participate in decision making.

Heritage interpretation, virtual access, experience quality, and smart tourism represent further areas of VR application. Bec et al. (2019) explain that immersive heritage tourism experiences require careful management because interpretation, authenticity, visitor engagement, and heritage value are all shaped through the design of the experience. Atzeni et al. (2022) further show that non immersive VR heritage experiences can influence authenticity perceptions and visit intention, suggesting that VR may extend access

to cultural or heritage sites beyond physical visitation. Yersüren and Özel (2024) show that the perceived quality of VR experiences matters for how users evaluate virtual and physical travel possibilities. These studies indicate that VR can support heritage access, interpretation, and experience design, but they also raise concerns about representation and control. A technically strong VR experience may still be problematic if it misrepresents local culture, excludes community voices, or channels benefits to external providers. This concern is reinforced by wider smart tourism debates. Gretzel et al. (2015) explain that smart tourism involves technology enabled systems that reshape how tourism value is created and exchanged. VR is therefore not an isolated tool, but part of a wider digital tourism infrastructure involving platforms, data, software, hardware, and commercial intermediaries. For local communities, the key question is whether VR strengthens community agency or increases dependency on external platforms and providers.

The representational power of VR is especially important from a decolonial perspective because tourism does not simply display places; it helps produce meanings about whose histories, identities, and cultural knowledges are recognized. Hollinshead et al. (2021) argue that tourism has an inscriptive and worldmaking role, which means VR can either support plural, community-led representation or intensify outsider-controlled narratives. This concern becomes stronger in VR because immersive environments can make digital representations feel vivid, authentic, and authoritative. Therefore, VR tourism must be assessed not only by its novelty or technical quality, but also by the extent to which communities control the narrative, give cultural consent, and benefit from the circulation of cultural content.

The range of VR applications in tourism shows that VR should not be treated as a single purpose technology. It can support destination marketing, virtual tourism during disruption, memorable experience design, heritage interpretation, virtual heritage access, smart tourism value creation, and community storytelling. However, these functions do not automatically produce sustainable community development. Some may primarily serve tourists, destination marketers, or platform owners. Others may support community voice, cultural preservation, education, and local resilience if they are designed through participatory and ethical governance. Table 1 below summarizes these applications by identifying one indicative reference for each function, its tourism use, its potential relevance to sustainable community development, and its key limitation or risk.

VR as a tool for sustainable community development

Sustainable community development refers to a process through which communities organize resources, relationships, and collective action to improve long term social, economic, cultural, and environmental wellbeing. Matarrita-Cascante and Brennan (2012) conceptualize community development as an organized and participatory process through which people work collectively to create the kind of community in which they wish to live. This definition is important for the present paper because it places local agency, participation, and shared direction at the center of development. Sustainable community development therefore cannot be reduced to economic growth or external investment. It requires attention to local capacity, community participation, resource use, cultural continuity, and the ability of communities to shape their own futures.

Table 1. Key applications of VR in tourism and their relevance to sustainable community development.

VR application	Key reference	Tourism use	Potential relevance to sustainable community development	Limitation or risk
Destination marketing	Loureiro et al. (2020)	VR and AR are used in tourism research and practice to support destination marketing, immersive experience design, mobility substitution, cultural heritage interpretation, and smart tourism applications.	May increase destination visibility, support place-based storytelling, and create interest in lesser-known communities or cultural sites	Benefits may remain at the level of image building or tourist intention, without direct income, ownership, or decision-making power for local communities
Virtual tourism during travel disruption	Godovykh et al. (2022)	Provides virtual tourism experiences when physical travel is restricted or less accessible	May help destinations maintain visibility during crises	Visibility does not necessarily produce local income or equitable community benefit
Memorable virtual tourism experience	Jorge et al. (2023)	Uses VR to create memorable tourist experiences and influence future intentions	May support emotional connection to place and future engagement	Mainly addresses tourist intention rather than community ownership or benefit sharing
Heritage interpretation	Bec et al. (2019)	Uses immersive technologies to manage and interpret heritage tourism experiences	May support heritage awareness and cultural education	Heritage may be simplified, distorted, or commodified if communities do not control interpretation
Virtual heritage access	Atzeni et al. (2022)	Provides non immersive VR heritage experiences linked to authenticity and visit intention	May widen access to heritage sites for people unable to visit physically	Access for users does not automatically mean benefit for host communities
VR experience quality	Yersüren and Özel (2024)	Examines how VR experience quality affects destination visit intention and VR travel intention	May help improve the design quality of virtual tourism experiences	Quality improvement may serve market goals more than community development goals
Smart tourism and digital value creation	Gretzel et al. (2015)	Positions smart tourism around ICT enabled value creation within tourism systems	May help frame VR as part of wider digital tourism infrastructure	Smart tourism can privilege technologically powerful actors and deepen digital inequalities

Roseland (2012) similarly emphasizes sustainable communities as places where social equity, environmental responsibility, and economic viability are pursued together rather than separately. This integrated view is useful for understanding the possible role of VR in tourism related community development. If VR is treated only as a promotional tool, its value is limited to visitor attraction or destination visibility. If it is treated as part of community development, the focus shifts to whether it helps communities preserve cultural knowledge, widen access, strengthen local skills, create new forms of participation, and retain authority over representation and benefit sharing. This paper therefore adopts a community centered position: VR may support sustainable development only when it is designed through participatory processes and when communities retain meaningful authority over representation, access, ownership, and benefits.

Beyond destination marketing and visitor engagement, VR may contribute to sustainable community development in four main ways: cultural preservation, inclusive access,

participatory engagement, and economic resilience. These areas should be understood as conditional possibilities rather than guaranteed outcomes. In relation to cultural preservation, immersive technologies may help communities document and communicate heritage, oral history, local memory, and place based identity. Bec et al. (2019) show that immersive heritage tourism experiences require careful management because they involve interpretation, authenticity, and visitor engagement. This is important because VR can make cultural representation feel vivid and persuasive. However, this also creates risk. If communities do not control the interpretation of their own heritage, VR may reproduce simplified, commercialized, or externally controlled narratives.

The potential of VR for cultural preservation is also linked to wider debates about heritage futures in the digital age. Heritage conservation must respond to changing digital conditions and the ways in which heritage is increasingly produced, circulated, and valued through digital systems. In this context, VR may be useful for preserving fragile heritage sites, endangered cultural practices, and community memory. However, digital preservation is not automatically community preservation. A digital record may protect visual or narrative material, but the community development value depends on who decides what is recorded, who controls access, who owns the digital material, and how benefits are returned to the community. The Virtual Songlines project in Australia provides one useful example of how VR can be used to support Indigenous cultural storytelling. Leavy (2020) describes the project as a VR initiative that enables Aboriginal stories and cultural knowledge to be shared through immersive digital environments. For this paper, the example is useful because it shows how VR can be connected to cultural interpretation and Indigenous representation. However, it should not be used as proof that all VR initiatives produce decolonial or community centered outcomes. Its relevance lies in showing the kind of community authority that is needed if VR is to support cultural sovereignty rather than merely digitize culture for external consumption.

VR may also support inclusive access by enabling people to engage with cultural and tourism experiences when physical travel is difficult, expensive, or impossible. Atzeni et al. (2022) demonstrate that virtual heritage experiences can influence visitors' perceptions of authenticity and their intention to visit the heritage site in person. Virtual access can therefore extend cultural engagement beyond the physical site and create opportunities for people who may otherwise be excluded from heritage tourism. For sustainable community development, the value of inclusion should not be limited to virtual visitors. It must also include the ability of host communities to access the technology, training, infrastructure, and decision-making processes needed to produce and manage VR content on their own terms. Without this local capacity, virtual access may widen audiences without strengthening community participation or benefit.

The social value of VR also depends on the nature of participation. VR can reduce barriers associated with physical travel, including mobility, distance, cost, and infrastructure limitations. It can also create new barriers when communities or users lack digital access, technical skills, or affordable devices. For this reason, VR should not be described as automatically democratizing tourism. Its capacity to broaden access to cultural and educational experiences depends on whether digital inclusion is addressed. In community development terms, the question is not simply whether more people can view a virtual

destination, but whether the process of creating and managing the VR experience strengthens local capability, community voice, and shared cultural understanding.

VR may further support participatory engagement when it is used to help residents, community groups, cultural organizations, and tourism stakeholders discuss future development options. In principle, digital simulations can help people visualize proposed changes to tourism spaces, heritage areas, or community environments. However, this claim should be made cautiously because the tourism literature does not yet provide enough evidence to show that VR based planning consistently improves community power. In the meantime, smart tourism development requires critical reflection, not only enthusiasm for technology. Applied to VR, this means that participatory tools are meaningful only when community input has real influence over decisions. Otherwise, VR may become a consultation display rather than a mechanism for shared governance.

Economic resilience is another possible area of contribution, although it requires careful qualification. Traditional tourism models are vulnerable to external shocks because they often depend on physical mobility, international visitor flows, and face to face consumption. Hall et al. (2020) show pandemics expose the fragility of tourism systems by disrupting mobility, visitor demand, and destination recovery, suggesting that economic resilience requires more than a return to growth and must include more sustainable and adaptive forms of tourism development. VR may offer one way to maintain engagement with places, stories, and cultural assets during periods of disruption. However, maintaining engagement is not the same as generating community income. Current evidence is stronger for engagement, destination visibility, visit intention, and willingness to participate than for proven community income. For this reason, economic benefit should be treated as a conditional possibility rather than an assumed outcome. Potential revenue mechanisms may include paid virtual tours, digital storytelling products, heritage licensing, online education, community led workshops, or partnerships with cultural institutions. These mechanisms support sustainable community development only when revenue models are transparent, locally controlled, and connected to fair benefit sharing.

Virtual Yosemite provides a useful example of remote digital engagement with a major natural attraction. The project offers an immersive online experience of Yosemite National Park and enabled continued virtual engagement when physical travel was restricted (Virtual Yosemite, 2025). For this paper, the example should be used cautiously. It shows how immersive digital access can maintain public interest in a place, but it does not prove direct income generation for local communities. This distinction directly addresses the concern that VR benefits should not be assumed. VR can support resilience by maintaining visibility and engagement but claims about economic benefit must be tied to ownership, revenue sharing, and local participation. The Faroe Islands' Remote Tourism initiative offers another example of how destinations used digital engagement during periods of global travel restriction. Visit Faroe Islands (2020) presented the initiative as a way for remote visitors to experience the destination through live interaction with local guides. The example is useful because it illustrates how digital tourism can maintain destination visibility and create remote forms of engagement. However, it should also be interpreted carefully. Remote engagement does not necessarily mean long term economic resilience or equitable community benefit. For such initiatives to

support sustainable community development, they need to be connected to clear local employment, community participation, and benefit sharing arrangements.

Digital reconstruction projects may also create new forms of specialist work and cultural education, although these benefits again depend on the structure of the project. Chandler and Clulow (2020) discuss the modeling of Virtual Angkor as a digital reconstruction of a historic urban space. This type of project shows how historians, artists, designers, and digital specialists may collaborate to produce immersive heritage environments. However, such projects should not be framed simply as local employment creation unless the evidence clearly shows who was employed and how benefits were distributed. Their stronger relevance for this paper lies in showing how VR can support cultural education, historical interpretation, and interdisciplinary digital heritage work.

The risk of economic leakage is especially important in VR-based tourism. Chambwe and Saayman (2025) emphasize that local tourism value depends on whether communities have the capacity, support, and ownership structures needed to participate meaningfully in the value chain. VR initiatives often rely on technology providers, software platforms, content developers, and distribution channels that sit outside the community, making questions of ownership and benefit sharing especially important. If these actors control production, ownership, pricing, and revenue, VR may reproduce the same inequalities found in conventional tourism value chains. For VR to support sustainable community development, communities need more than digital visibility. They need meaningful involvement as decision makers, storytellers, owners, and beneficiaries. Its value therefore depends on participatory governance, local capacity building, ethical representation, and fair benefit sharing. When these conditions are absent, VR may extend the reach of tourism without strengthening community control or resilience.

Decolonial perspectives on VR, representation, and community authority

Decolonial perspectives are concerned with the ways in which knowledge, culture, identity, and representation are shaped by unequal relations of power. In tourism studies, this perspective is important because tourism does not only move people between places. It also produces meanings about places, people, histories, cultures, and identities. Smith (2013) demonstrates that decolonizing work involves challenging colonial and neocolonial inheritances in knowledge production. Applied to tourism, this means questioning who has the authority to describe a community, whose knowledge is treated as legitimate, whose histories are made visible, and who benefits from the circulation of cultural representation. Decolonial thinking therefore shifts attention from tourism as an economic activity to tourism as a representational and political process.

Tourism has often been criticized for reproducing unequal power relations between visitors and hosts, centers and margins, and external interpreters and local communities. Tucker and Akama (2009) position tourism as deeply connected to postcolonial relations because tourism often organizes how cultures are seen, consumed, and interpreted. For community development, the concern is that local communities may become objects of tourism representation without meaningful influence over how they are portrayed. When cultural identity is packaged for external audiences, community knowledge may be simplified, exoticised, or commercialized. From a decolonial perspective, sustainable

community development therefore requires more than economic inclusion. It also depends on communities having the right to define how their histories, identities, and cultural knowledge are interpreted and shared.

Hollinshead et al. (2021) extend this argument by describing tourism as a field with worldmaking and declarative power. Tourism can interpret and inscribe peoples, places, pasts, and presents, shaping how destinations and communities are imagined by others. Their discussion of plural knowability, fluid acumen, and critical multilogicality challenges any single or fixed representation of community identity. Places and cultures are interpreted through multiple voices, shifting identities, and contested memories. In VR tourism, immersive technologies can make a selected version of place feel complete, authentic, and emotionally convincing. The risk is that VR may strengthen the authority of a single external narrative if the process of design and interpretation is not community led.

Decolonial thinking is also important because tourism can be more than an industry. Higgins-Desbiolles (2006) argues that tourism should be understood as a social force rather than only an economic sector. This broader view is useful for connecting VR to sustainable community development. If VR tourism is treated only as a market product, its value will be measured through user experience, destination promotion, or commercial return. If it is treated as a community development tool, its value must also be assessed through cultural integrity, social justice, local capacity, and community control. A VR project may be visually impressive and commercially successful, but it may still fail from a decolonial perspective if it extracts cultural value without community consent or benefit.

In this study, decolonial perspectives are used to examine the conditions under which VR may support community authority rather than reproduce extractive tourism. VR is not inherently decolonial. It may support self-representation when communities control the storytelling process, decide what cultural knowledge can be shared, retain ownership of digital content, and participate in benefit sharing. It may also reproduce colonial or neocolonial relations if external actors control the platform, design, narrative, and revenue model. This distinction is central to sustainable community development because communities do not only need visibility. They need the power to decide how they are represented, what should remain protected, and how digital tourism value should be distributed. The decolonial value of VR lies not in the technology itself, but in the governance arrangements surrounding it. Community centered VR requires participatory design, cultural consent, protection of intellectual and cultural property, locally meaningful benefit sharing, and respect for multiple forms of knowledge. This perspective helps address the risk that VR may become another medium for packaging local culture for external consumption. It also strengthens the conceptual framework developed in this paper by positioning decolonization as a governance condition for sustainable community development. Through this lens, VR can be evaluated not only by its immersive quality or tourist appeal, but also by whether it supports community agency, cultural sovereignty, and more equitable tourism futures.

Conceptual and methodological approach

This paper adopts a conceptual synthesis approach to develop a community centered framework for understanding the relationship between VR tourism and sustainable community development. The approach follows Xin et al. (2013) argument that conceptual research has a specific role in tourism scholarship because it can clarify concepts, connect fragmented areas of knowledge, and generate new theoretical directions. In this paper, conceptual synthesis is used to connect literatures that have often developed separately: VR tourism, sustainable community development, digital sustainability, tourism imaginaries, and decolonial tourism. The purpose is to move the discussion of VR beyond tourist experience and destination promotion toward a framework that can assess community authority, cultural representation, and fair benefit sharing.

The synthesis began with the problem identified in the literature. VR tourism research has examined destination marketing, tourist experience, visit intention, heritage interpretation, and immersive engagement. Sustainable community development scholarship, by contrast, is concerned with participation, capacity building, cultural continuity, local resilience, and governance. These two areas overlap in practice but are not yet sufficiently integrated conceptually. Following Xin et al. (2013), the paper therefore uses conceptual work as a means of reframing the relationship between existing ideas rather than simply summarizing previous studies. The second stage of the synthesis drew on the concept of tourism imaginaries. Salazar (2012) claims that tourism imaginaries are not neutral images of places and peoples. They are produced, circulated, and consumed through tourism, and they shape how destinations, cultures, and communities are imagined. This is central to the present paper because VR tourism does not merely display a place. It produces an immersive imaginary of that place. A VR representation of a community, cultural landscape, heritage site, or historical memory can make a selected version of place feel immediate and authentic. This makes the question of representation methodologically important for the framework: VR must be analyzed not only as a technology of experience, but also as a technology of imagination and interpretation. The third stage applied a decolonial lens to this representational problem. Smith (2013) frames decolonizing scholarship as a challenge to unequal systems of knowledge production, particularly where external authorities have historically defined, interpreted, and represented Indigenous and marginalized communities. This lens is important for examining VR tourism because digital representations can reproduce the same extractive relations found in conventional tourism if communities do not control the narrative, ownership, or benefits. Hollinshead et al. (2021) extend this concern within Tourism Studies by emphasizing tourism's worldmaking and declarative power in interpreting and inscribing peoples, places, pasts, and presents. In this paper, decolonial thinking is not used as the method itself. Rather, it provides the critical lens through which the framework assesses whether VR supports community authority or reproduces outsider-controlled representation.

The framework was then developed through three analytical steps. First, the main functions of VR in tourism were identified, including destination marketing, virtual heritage access, heritage interpretation, memorable experience design, crisis related digital engagement, and smart tourism value creation. Second, these functions were connected

to community development concerns, including economic resilience, cultural preservation, social inclusion, and community governance. Third, the decolonial and tourism imaginaries lenses were used to identify the governance conditions required for VR to move from tourism engagement to community centered development. These conditions include participatory design, cultural consent, local ownership, narrative authority, digital capacity building, transparent benefit sharing, and platform accountability.

Theoretical perspectives and conceptual framework

VR tourism can be understood through three connected theoretical perspectives: experience economy theory, digital sustainability, and decolonial tourism. Each perspective explains a different part of the framework. Experience economy theory explains why VR can create immersive and memorable engagement. Digital sustainability explains how digital tools may support lower impact and more resilient forms of tourism participation. Decolonial tourism explains why representation, ownership, cultural authority, and benefit sharing must be central to any community-based VR initiative.

Experience economy theory is relevant because VR is an experiential technology. Pine and Gilmore (1999) argue that economic value increasingly emerges through staged and memorable experiences rather than through products or services alone. In tourism, VR can create emotional engagement with places, cultures, and heritage sites by allowing users to enter and interact with simulated environments. However, experience itself is not enough to support sustainable community development. A memorable VR experience may increase interest in a destination, but this does not necessarily produce local benefit. For VR to support community sustainability, the experience must be connected to local storytelling, cultural consent, community participation, and fair distribution of benefits.

Digital sustainability provides the second foundation. Gretzel et al. (2015) discuss that digital transformation in tourism as a process that requires critical thinking about sustainability, power, and the future of tourism systems. VR may reduce some reliance on physical visitation and offer new ways to engage with cultural and natural resources. Yet digital sustainability is not simply a matter of replacing physical travel with virtual access. VR depends on digital infrastructure, technical skills, platform access, energy use, data systems, and governance arrangements. A VR initiative may reduce pressure on fragile sites while still creating new inequalities if communities lack the resources or authority to control the digital product. For this reason, digital sustainability in this framework refers to community controlled and socially responsible digital participation rather than technology adoption alone.

Decolonial tourism provides the critical foundation of the framework. Smith (2013) argues that decolonizing work requires attention to the politics of knowledge production, particularly where Indigenous and marginalized communities have historically been represented by external authorities. Salazar (2012) conceptualizes tourism imaginaries as forces that shape how people, places, and cultures are represented, circulated, and understood through tourism. VR intensifies this issue because immersive representations can make a selected version of place feel immediate, authentic, and emotionally persuasive. A VR experience does not simply show a destination. It frames what is visible, what is hidden, whose voice is heard, and whose interpretation becomes authoritative.

Decolonial tourism therefore requires VR to be assessed through questions of cultural consent, narrative authority, local ownership, and benefit sharing.

Figure 1 presents the conditional logic of the community centered VR sustainability framework. VR tourism functions provide the starting point. These functions include destination marketing, virtual heritage access, heritage interpretation, memorable experience design, crisis related digital engagement, and smart tourism value creation. These functions do not automatically produce sustainable community development. They must be mediated by governance conditions, including participatory design, cultural consent, local ownership, narrative authority, digital capacity building, transparent benefit sharing, and platform accountability.

When these governance conditions are present, VR may support economic resilience, cultural preservation, social inclusion, and community authority. When they are weak or absent, the same VR functions may produce economic leakage, cultural commodification, digital exclusion, platform dependency, and outsider-controlled representation. The framework therefore rejects a promotional view of VR as inherently sustainable or empowering. VR becomes valuable for community development only when communities are able to shape how digital experiences are designed, governed, owned, and monetized.

Figure 2 below extends the framework by showing how VR functions can be applied to community sustainability through a decolonial lens. Digital storytelling and virtual heritage access can support community archives, immersive heritage experiences, and inter-generational storytelling when elders, artists, youth, and cultural knowledge holders are involved in co creation. The decolonial safeguards for this function include cultural consent, narrative authority, and protection of sacred or sensitive knowledge. Its sustainability value lies in cultural preservation, stronger community identity, and reduced pressure on fragile heritage sites.

Virtual access and immersive education can support schools, museums, diaspora communities, and people who face mobility, financial, or geographical barriers to travel. Its value depends on inclusive design, community approval, and accessible technology. VR visualization for participatory planning can help communities discuss tourism development, visitor flows, conservation issues, and future community spaces. This function

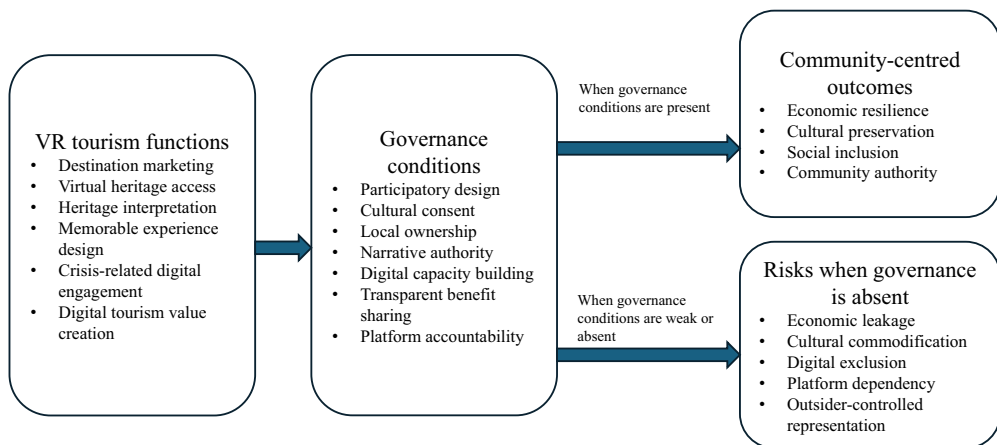


Figure 1. A community-centred VR sustainability framework.

VR Function	How communities can apply it	Governance safeguards	Sustainability value
Digital storytelling and virtual heritage access	Co-create stories, community archives, and immersive heritage experiences with elders, artists, and youth	Cultural consent; narrative authority; protection of sacred or sensitive knowledge	Cultural preservation; stronger community identity; lower pressure on fragile sites
Virtual access and immersive education	Develop virtual site visits, museum learning, and cultural education for schools, diaspora, and people with mobility barriers	Inclusive design; community approval; accessible technology and participation	Social inclusion; wider cultural learning; intergenerational knowledge sharing
VR visualisation for participatory planning	Use simulations to discuss tourism development, visitor flows, conservation, and future community spaces	Shared decision-making; transparent governance; platform accountability	Inclusive planning; stronger community input; clearer discussion of tourism impact
Virtual tours, workshops, and digital products	Offer community-led virtual tours, cultural workshops, online festivals, and licensed digital heritage products	Local ownership; fair pricing; rights protection	Economic resilience; diversified livelihoods; less reliance on physical visitation

Figure 2. Applying VR functions to community sustainability through a decolonial lens.

becomes meaningful only when simulations support shared decision making rather than symbolic consultation. Virtual tours, workshops, and digital products can create possible income pathways through community led tours, cultural workshops, online festivals, and licensed digital heritage products. These pathways require local ownership, fair pricing, rights protection, and transparent benefit sharing.

Discussions

The conceptual analysis addresses the three research questions by identifying the mechanisms, conditions, and theoretical lenses through which VR may support sustainable community development. In response to the first research question, VR can support community sustainability through applied mechanisms such as digital storytelling, virtual heritage access, immersive education, participatory planning, and community led digital products. These mechanisms move VR beyond destination promotion and tourist experience by linking immersive technology to cultural preservation, knowledge sharing, access, planning, and locally controlled value creation. The second research question concerns the conditions under which VR initiatives benefit local communities rather than external platform owners or tourism intermediaries. The analysis shows that VR tourism functions do not automatically produce sustainable community development. They become valuable for communities only when mediated by participatory design, cultural consent, local ownership, narrative authority, digital capacity building, transparent benefit sharing, and platform accountability. Without these conditions, the same VR functions may reproduce economic leakage, cultural commodification, digital exclusion, platform dependency, and outsider-controlled representation. A visually impressive VR experience may increase destination awareness, but it cannot be assumed to benefit communities if

local people have little authority over how the experience is designed, owned, priced, distributed, or interpreted. The third research question is addressed through the integration of experience economy theory, digital sustainability, and decolonial tourism perspectives. Experience economy theory explains why VR can create immersive and memorable engagement. Digital sustainability helps assess whether VR can support more resilient and less resource intensive forms of participation. Decolonial tourism provides the critical lens for examining representation, ownership, cultural consent, and benefit sharing. Together, these perspectives shift the discussion from whether VR is technologically innovative to whether it is community governed, culturally responsible, and linked to sustainable local value.

The applied value of the framework lies in showing how communities may use VR through four main functions: digital storytelling and virtual heritage access, virtual access and immersive education, VR visualization for participatory planning, and virtual tours, workshops, and digital products. Digital storytelling can support community archives, language preservation, intergenerational learning, and heritage interpretation. Virtual access and immersive education can expand participation for schools, diaspora communities, older adults, and people who face mobility or financial barriers to travel. VR visualization can support planning conversations about visitor flows, conservation, land use, and future community spaces. Virtual tours, workshops, and digital products can create possible income pathways, provided that ownership and benefit sharing remain locally controlled. Each VR function also requires decolonial safeguards. Digital storytelling requires cultural consent, narrative authority, and protection of sacred or sensitive knowledge. Virtual access requires inclusive design and community approval rather than simply opening cultural content to global audiences. Participatory planning requires shared decision making and platform accountability, otherwise simulation may become a symbolic consultation tool with little influence on actual decisions. Digital products require rights protection, fair pricing, local ownership, and transparent benefit sharing. These safeguards are the conditions that determine whether VR supports community sustainability or becomes another form of digital extraction.

Theoretical implications

The framework offers three theoretical implications. First, it extends experience economy theory by arguing that memorable experience alone is insufficient in community-based VR tourism. Pine and Gilmore's (1999) experience economy framework helps explain why VR can produce immersion, emotional engagement, and memorable encounters. However, in the context of sustainable community development, experience must be connected to ownership, consent, and benefit sharing. This means that the value of VR should not be judged only by tourist satisfaction or presence. It should also be judged by whether communities can use immersive experience design to strengthen cultural continuity, local capability, and community authority.

Second, the framework extends digital sustainability debates by showing that digital tourism is not automatically sustainable. Gretzel et al. (2015) position smart tourism as the

increasing use of ICTs to transform tourism systems and create new forms of value, and this paper applies that concern to VR as part of wider digital tourism infrastructure. VR may reduce pressure on fragile sites or enable forms of participation that do not require physical travel. Yet it may also create new dependencies on platforms, devices, software providers, and technical expertise. Digital sustainability therefore requires more than digital access or reduced mobility. It requires long term community capacity, locally meaningful digital infrastructure, accountable partnerships, and fair control over digital value chains.

Third, the framework contributes to decolonial tourism thinking by positioning decolonization as a governance condition rather than a symbolic claim. Smith (2013) reminds us that decolonizing work is concerned with the politics of knowledge production. Salazar (2012) shows that tourism imaginaries shape how people and places are produced and circulated through tourism. In VR tourism, these issues become more pressing because immersive representation can make one version of a place appear complete and authoritative. The framework therefore argues that decolonial VR is not defined by the use of Indigenous or local cultural content. It is defined by who controls the process of representation, who approves the narrative, who owns the digital material, and who benefits from its circulation.

Practical implications

For communities, the first practical step is not to decide which VR technology to buy, but to decide what community purpose the technology should serve. A community may use VR to preserve cultural memory, teach younger generations, connect with diaspora groups, manage visitor pressure, support conservation education, or create small scale digital income. These purposes require different designs. A community archive may need careful cultural protocols and restricted access. A virtual tour may need pricing, licensing, and a revenue model. A planning simulation may need workshops, facilitation, and feedback processes. Communities should therefore begin with a local decision-making process that identifies what stories, sites, practices, or environmental concerns can be shared, what should remain protected, who has cultural authority to approve the content, and what form of benefit would be meaningful. This prevents VR from becoming a technology led project where the platform determines the community's priorities.

Communities also need to treat VR content as a cultural and economic asset. Before agreeing to digitize a place, practice, story, or heritage site, they should clarify ownership, access, licensing, and withdrawal rights. These issues should be discussed before production begins, not after the VR product has been created. Communities should ask practical questions: Who owns the 3D models, videos, sound files, scripts, images, and user data? Can the community edit or remove content later? Can the content be sold, reused, or placed on other platforms? Who receives payment if the VR experience is monetized? Who is responsible for maintenance and updates? These questions are especially important when VR involves Indigenous knowledge, sacred places, personal memory, or trauma related heritage. A community centered VR project should include written agreements that protect cultural authority and prevent external organizations from treating community stories as reusable digital content.

For policymakers and funding agencies, the practical priority is to move beyond funding “innovation” as a neutral good. VR projects that involve community heritage or local cultural knowledge should be assessed against community benefit criteria. Funding applications should require evidence of cultural consent, community participation, ownership arrangements, benefit sharing, accessibility planning, and long-term maintenance. Public agencies could also support community owned VR infrastructure by funding training, equipment libraries, local digital studios, or partnerships between communities and universities. Small communities are unlikely to benefit from VR if they are expected to rely entirely on external technology providers. Policy support should therefore focus on building local capacity, not only producing attractive digital tourism products.

For educational institutions, museums, and cultural organizations, the practical role should be one of support rather than control. These institutions can provide training in digital storytelling, cultural mapping, VR production, archive management, ethical design, and evaluation. However, they should not become the main voice of the community. A stronger model is co-creation, where elders, youth, artists, cultural knowledge holders, local tourism operators, and community organizations decide the narrative direction and access conditions. Universities and museums can assist with technical quality, documentation, and interpretation, while cultural approval remains with the people whose heritage is being represented. Such safeguards are especially necessary when VR projects involve sensitive knowledge, restricted sites, contested histories, or living cultural practices.

For tourism businesses and technology providers, the key practical shift is from content extraction to accountable partnership. Businesses should not approach communities simply as sources of stories, images, rituals, landscapes, or heritage assets. Ethical VR partnerships should specify how digital content will be produced, who will own it, how revenue will be shared, how the community can review or withdraw content, and how long the partnership will last. Technology providers should also make the production process understandable to communities. This includes explaining what data are collected, how platforms operate, what costs are involved in maintenance, and what technical dependencies may remain after launch. A VR project that is visually impressive but leaves the community dependent on an external platform, unable to update its own content, or excluded from revenue decisions cannot be considered community centered.

For destination managers, VR should be used selectively rather than as a general marketing add on. Not every destination or community needs a virtual experience. VR is most useful where immersion adds value: fragile heritage sites, difficult to access landscapes, cultural education, community storytelling, environmental interpretation, diaspora engagement, or participatory planning. Destination managers should avoid using VR only to intensify demand for already pressured places. A more responsible use is to redirect attention toward lesser-known stories, educate visitors before arrival, reduce pressure on sensitive locations, and support local interpretation. In this sense, VR can become part of visitor management and community sustainability rather than simply another promotional channel.

Across all stakeholder groups, the most important practical principle is that VR should be designed backwards from community benefit. The process should begin with the community’s cultural, social, environmental, or economic goals, then identify the appropriate VR function, then establish safeguards around consent, ownership, access, and

benefit sharing. This sequence matters. If the process begins with technology, communities may be fitted into someone else's platform logic. If it begins with community priorities, VR can become a tool for cultural continuity, inclusive learning, responsible engagement, and locally governed value creation.

Limitations and future research

The paper develops a conceptual framework rather than testing the outcomes of specific VR initiatives. Future empirical research should examine whether community governed VR projects actually produce the outcomes proposed here. Comparative case studies would be useful across Indigenous, rural, urban, heritage, and diaspora communities. Future studies could also examine the economic viability of community led VR products, including pricing, licensing, labor requirements, revenue distribution, and long-term maintenance costs. More research is also needed on digital exclusion, especially where communities lack broadband access, technical skills, equipment, or institutional support.

A further area for future research concerns cultural consent and digital rights. VR raises specific ethical questions because it can record, reconstruct, and circulate places and practices in highly immersive forms. Future research should examine how communities decide what can be digitized, what should remain restricted, and how sensitive knowledge should be protected. For Indigenous communities and other groups whose cultural heritage has historically been extracted, displayed, or commercialized without consent, these questions are especially urgent. Research should also explore how legal frameworks, intellectual property arrangements, and platform policies can better protect community rights in VR tourism.

VR can be useful for community sustainability, but only if the purpose of VR is redefined. The central question should not be how VR can make tourism more exciting, more marketable, or more technologically advanced. The stronger question is how VR can help communities retain cultural authority, build digital capacity, protect heritage, widen access, and create fairer forms of tourism value. Under a decolonial lens, VR becomes meaningful not because it is immersive, but because it can be governed differently. If communities are positioned as owners, designers, storytellers, and beneficiaries, VR may support more sustainable tourism futures. If they are positioned only as content, VR will simply make old inequalities more vivid.

Ethical and governance considerations

The first ethical issue is cultural authority. VR based tourism does not simply present community heritage. It selects, frames, edits, and circulates particular versions of culture, place, memory, and identity. Salazar (2012) argues that tourism imaginaries shape how places and people are produced, circulated, and consumed through tourism. This concern becomes stronger in VR because immersive representation can make a digital narrative feel highly authentic even when the process behind it is externally controlled. Community heritage, oral histories, sacred places, rituals, local memories, and cultural landscapes should therefore not be treated as open content for digital conversion. Ethical VR governance requires cultural consent before digitization, clear rules about what can and cannot be shared, and recognition that some knowledge may be restricted to particular

families, elders, iwi, clans, or knowledge holders (Wang, 2024). A decolonial approach should not assume a single community voice, because communities may disagree about what should be represented, who has authority to approve cultural content, and how sensitive knowledge should be protected. The key governance issue is therefore not only whether VR content is accurate, but whether the community has authority to approve, revise, restrict, or withdraw the representation.

The second issue is ownership and economic control. A VR project may increase destination visibility or attract global attention, but visibility alone does not create community development. Chambwe and Saayman (2025) argue that tourism value chain ownership in rural communities requires alignment between local needs, community capacity, and support structures. In VR tourism, this concern becomes more complex because technology firms, destination agencies, or platform intermediaries may control digital assets, pricing, licensing, distribution, and user data. When this occurs, VR may reproduce the economic leakage already found in conventional tourism. Community-centered VR requires transparent agreements about who owns the digital product, who can modify it, where it can be distributed, how long it remains available, and how revenue is shared. Digital cooperatives, community trusts, co-managed platforms, and licensing agreements may provide more equitable models, but only when communities hold genuine decision-making power rather than symbolic consultation status. Data governance should also be included in these agreements because VR platforms may collect behavioral data, gaze patterns, interaction choices, and engagement metrics. These data can be commercially valuable, yet they are often generated through community cultural content. Ethical VR tourism should therefore address both cultural ownership and data rights.

The third issue is platform accountability and long-term stewardship. Smart tourism development requires careful consideration of governance, technology, and power rather than simple enthusiasm for digital innovation. VR projects are often presented as innovative at the point of launch, but community sustainability depends on what happens after the initial project is built. Digital content needs maintenance, updating, technical support, storage, rights management, and continued community review. Without long-term stewardship, communities may lose control over outdated, inaccurate, or culturally inappropriate representations that continue to circulate online. Platform accountability also matters because digital access is uneven. Communities may be invited into VR tourism without having the infrastructure, equipment, skills, or funding needed to manage it on their own terms. The governance conditions in [Figure 1](#) should therefore be treated as minimum requirements rather than optional enhancements. Participatory design, cultural consent, local ownership, narrative authority, digital capacity building, transparent benefit sharing, and platform accountability are the mechanisms through which VR can move from digital representation to community-centered sustainability. When these conditions are absent, VR may still be immersive and commercially successful, but it cannot be assumed to support sustainable community development.

Conclusion

This paper has argued that VR should not be understood only as a marketing tool, a travel substitute, or an immersive extension of destination promotion. Through a conceptual

synthesis of VR tourism, sustainable community development, digital sustainability, tourism imaginaries, and decolonial tourism literature, it develops a community centered VR sustainability framework. The framework positions VR as a possible form of digital community infrastructure when it is shaped by local priorities, cultural authority, and fair governance. By integrating experience economy theory, digital sustainability, and decolonial tourism perspectives, the study explains why VR functions must be assessed through governance conditions rather than assumed benefits. Destination marketing, virtual heritage access, immersive education, digital storytelling, participatory planning, and virtual products may all support community sustainability, but only when communities retain control over representation, ownership, access, and benefit sharing.

The central argument is that VR does not automatically create sustainable community development. It can widen access, preserve heritage, support education, reduce pressure on fragile sites, and create new livelihood opportunities, but it can also intensify cultural commodification, economic leakage, digital exclusion, and outsider-controlled representation. Under a decolonial lens, the question is not whether VR is innovative, realistic, or engaging, but whether it redistributes authority to the communities whose places, memories, and cultural identities are being represented. If VR is governed through participatory design, cultural consent, local ownership, narrative authority, digital capacity building, transparent benefit sharing, and platform accountability, it may help communities build more resilient and culturally grounded tourism futures. If these conditions are absent, VR risks becoming a more immersive version of the same unequal tourism relationships that sustainable community development seeks to challenge.

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ORCID

Pola Qi Wang  <http://orcid.org/0000-0002-2435-7755>

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