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Joined-up Governance and Sustainable Finance for Inclusive Ridge-to-Reef Conservation in Southwest Papua, Indonesia

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Abstract

Southwest Papua province, Indonesia, is home to globally significant terrestrial and marine ecosystems that are critical for biodiversity, carbon storage, and the livelihoods of Indigenous Peoples and Local Communities (IPLCs). However, increasing exploitation of natural resources, environmental degradation and socio-economic inequities challenge sustainable development in this region. This paper focuses on integrating Ridge to Reef (R2R) governance frameworks and sustainable finance mechanisms to address the dual challenges of biodiversity loss and socio-economic disparities. Specifically, we investigate how joined-up government and innovative financial strategies can support sustainable and inclusive management of Southwest Papua's interconnected ecosystems. Our study examines governance gaps, explores sustainable financing approaches, and proposes an institutional model for integrated R2R management. Using a mixed-methods approach, including stakeholder interviews, focus group discussions, and participatory workshops, we developed a proposed governance framework and financing strategies tailored to Southwest Papua's unique ecological and cultural context. This study contributes to the understanding of R2R governance by offering practical and scalable solutions for integrated terrestrial and marine resource management. This research encourages the need to establish the Ridge to Reef Development Collaboration Agency - Southwest Papua Province (BKPR2R-PPBD), as an entry point to strengthen capabilities and resources. This institution will also open up opportunities to build more innovative R2R financing models. It suggests that a blended finance model, where public sector results-based payment schemes help de-risk private capital, can significantly enhance holistic R2R conservation while promoting more equitable resource sharing. Findings also highlight the importance of inclusive governance structures, such as the proposed BKPR2R-PPBD, to bridge sectoral divides, foster IPLC participation and empower local perspectives in decision-making. These emphasize the potential of complimentary joined-up government and innovative financing arrangements to enhance environmental sustainability and community well-being in Southwest Papua, and offers a replicable model for other biodiversity-rich regions striving to balance conservation with inclusive development.

Keywords: Ridge to Reef; Joined-up governance; Policy coordination; Policy integration; Sustainable finance; Biodiversity conservation, Gender, Social inclusion

1. Introduction

"We believe that the forest is our mother, which we must take good care of, so that it can sustain life from generation to generation; We respect the sea like our father. It gives us abundant blessings to live continuously until God comes" (Villager of Waifo, Raja Ampat, 2023)

Indonesian Papua is a critical front for global forest conservation and climate action. With 83% of its land area covered by forest, it hosts the world's third largest intact rainforest after the Amazon and Congo (Gaveau et al. 2021; Mumbunan, et al., 2021). These forests play a significant role in mitigating climate change, sequestering 52 million tCO₂e annually and storing an estimated 10-15 gigatons of carbon (Mumbunan, et al., 2021). Beyond its ecological significance, Indonesian Papua's resources are vital for hundreds of indigenous groups who rely on them for sustenance and cultural preservation (Adiastuti et al. 2019; McLeod et al. 2009).

Unfortunately, Papua faces increasing threats from deforestation and environmental degradation. From 2000 to 2023, between 2,806 and 9,062 km² of forests were lost, mainly due to land conversion for agriculture, especially oil palm cultivation, and urban development (Pramudya et al. 2023). Additionally, peatlands have been degraded, necessitating restoration to prevent further degradation (Terzano et al. 2023). These challenges are exacerbated by weak governance and inadequate financial mechanisms, which intensify the strain on IPLC traditional and patriarchal systems and further restrict women's access to and control over resources.

Southwest Papua, a new province established in 2022, exemplifies these resource management challenges. Renowned for its marine biodiversity, including coral reefs, mangroves, and seagrasses (Aji et al. 2023), the province faces resource extraction pressures, such as upstream palm oil cultivation and mining, which have cascading impacts on marine ecosystems. These impacts include soil erosion, water pollution, and diminished fish stocks, which in turn undermine local livelihoods (Asmara et al., 2024; Tranter et al., 2022). Despite Southwest Papua's natural abundance, poverty grips over 18% of the population, about twice the national level (BPS, 2024). Further, it is argued that current conservation and restoration efforts are insufficient and need to be intensified (Terzano et al. 2023). Hence sustainable management of natural resources in this Province could have an outsized benefit to improving community welfare and conservation outcomes (Mollet, 2011).

Inadequate governance arrangements further compound these challenges. Natural resource management remains dominated by a sectoral approach, resulting in fragmented planning across forestry, agriculture and marine sectors (for example see Sopaheluwakan et al. 2023, Puri et al. 2014). Like many other regions, Southwest Papua suffers from a lack of integration between terrestrial and marine governance and planning. For example, in Southwest Papua, regional spatial planning (RTRW), which focuses on terrestrial areas, is not yet integrated to the coastal and small islands zoning plan (RZWP3K) (interview, March 2024). This disconnection leads to missing opportunities for synergistic, holistic actions that are critical in interconnected systems that support numerous sustainable development goals for people and nature.

Moreover, there has been inequitable financial flows to incentivise sustainable development as an alternative to counter current economic to increase logging, agricultural and mining activities (Gaveau et al., 2021; Mumbunan, et al., 2021). Despite significant commitments in international climate finance, healthy environments - such as Indonesian Papua's intact rainforests - receive minimal international funding or recognition despite their immense value to global climate action and biodiversity. Instead, international payments are predominantly directed toward regions already experiencing high deforestation, rather than regions that have low deforestation (Watson et al., 2018; TNC 2024).

Papua's Special Autonomy (Law No. 2/2021) and Sorong's local regulation (Perda) No. 10/2017 recognize indigenous rights, however gaps in implementation enable land conflicts and resource dispossession. In addition, the 2020 Omnibus Law exacerbates land problems by facilitating unconsulted land acquisitions, disproportionately affecting vulnerable groups including women who are already excluded by patriarchal systems. The decentralized governance system in Southwest Papua also inadequately addresses gender equality, disability, and social inclusion (GEDSI) (Boli et al., 2014), which limits participation of diverse and already marginalised stakeholders. Traditional knowledge, often overlooked in formal frameworks (McLeod et al., 2007) is crucial for ensuring equitable access, participation, and decision-making in managing this extraordinary biodiversity hotspot (UN Department of Economic and Social Affairs, 2019).

In light of these challenges, how can decision makers in Southwest Papua pave the way for a future where sustainable development and conservation can co-exist? The establishment of new governance structures offers an opportunity to integrate sustainable development into the provinces' special autonomy status. This article examines how a holistic governance and financial arrangement can be created to promote sustainable, equitable and prosperous management of resources from Ridge to Reef in Southwest Papua. Specifically, it aims to:

1. Develop and propose a governance framework that integrates terrestrial and marine resource governance.
2. Recommend an inclusive financial mechanism to incentivize conservation and sustainable livelihoods for IPLCs.

We leverage a 'Ridge to Reef' (R2R) concept that recognizes the important interdependencies and complexities among terrestrial, coastal and marine environments. This concept helps to illuminate how upstream land use impacts downstream environments, communities and economies. By adopting this approach, we aim to enhance understanding of the interconnectedness of natural resource management across various sectors, government levels, and actors in complex and fragmented multiscale systems by encouraging collaboration and effective integrated efforts (Fang et al., 2017; Kereseka 2021).

Focusing on Raja Ampat and Sorong regencies, this study highlights the urgent need for organizational and institutional arrangements to support R2R management and promote equitable and sustainable resource management. It also scopes a proposed financial mechanism for R2R conservation, emphasizing the importance of inclusive governance for this mechanism.

The findings are intended to inform Southwest Papua's upcoming provincial government, as well as other similar jurisdictions worldwide.

2. Conceptual Background

Ridge to Reef Conservation

The Ridge to Reef (R2R) concept offers a holistic, multidimensional approach to conservation that addresses environmental, socio-cultural, and economic dimensions from mountain peaks ('ridge') to coastlines and oceans ('reef') (Delevaux et al. 2018), promoting integrated natural resource management and socio-economic development (Fang et al. 2018). Adopted in multiple countries globally (e.g. Andales-Escano 2015; Fache and Pauwels 2022; Loganimocel and Meo 2023), this approach acknowledges that upstream activities, including forest conversion, logging, infrastructure development, and mining, can have direct effects on vital downstream ecosystems, such as mangroves, seagrass beds, and coral reefs (Wenger et al., 2020). Key principles of R2R include maintaining and promoting biodiversity and environmental services, supporting sustainable livelihoods, reducing poverty, improving governance, and fostering resilience to climate change through integrated resource management (GEF 2016; Fache and Pauwels 2022). This concept is particularly relevant for Southwest Papua. Despite existing regulatory frameworks like the Special Regional Regulations ('Perdatus') No. 10 of 2019 concerning 'Sustainable Development in West Papua Province', natural resource governance remains fragmented, with terrestrial (ridge) and marine ecosystems (reef) managed separately. This regulation also acknowledges the challenges in balancing economic, social and environmental interests. GEDSI is not commonly a strong feature of past R2R approaches, however, incorporating an inclusive approach is possible with careful planning to ensure marginalised voices are provided an opportunity to participate (Dhiaulhaq et al. 2024).

Nevertheless, successful implementation of R2R relies on innovative and inclusive governance frameworks that incorporate the perspectives of interests of various stakeholders, along with sustainable financing mechanisms. By combining the conceptual framework of joined up government and sustainable finance, this paper sees significant opportunities for R2R governance that is increasingly inclusive and sustainable. These are discussed in the following sections.

Joined-up Government

The 'Joined-up Government' concept provides a governance framework for R2R by fostering collaboration across sectors and levels of governance (Perri 6, 2004). Its benefits include a) Increasing collective policy output and outcomes; b) Overcoming complex problems collaboratively; c) Improving public services through alternative methods; d) Produce innovative programs and policies through collaboration of new thoughts/ideas originating from people with different backgrounds and perspectives; and e) Increasing the experience of actors involved in collaborative problem solving (Efficiency Unit 2009).

The application of the Joined-up Government framework for R2R Sustainable Natural Resource concept lies in two main components (Perri 6, 2004):

1. **Joined-up Policy Coordination:** Collaboration between institutions or organizations to build common understanding, information systems, program planning and decision-making processes.
2. **Joined-up Policy Integration:** Collaboration between institutions or actors in implementing decisions that have been collectively agreed upon through Policy Coordination, including monitoring and evaluation activities and application of sanctions for non-compliance.

Figure 1 outlines the operationalization of the Joined-up Government concept in R2R context, highlighting mechanisms for collaboration, policy alignment, and multi-stakeholder engagement. By integrating policies and fostering partnerships, joined-up governance ensures sustainable and equitable resource management across ecosystems, supporting long-term R2R conservation in Southwest Papua.

In Southwest Papua, implementing R2R with Joined-up Policy Coordination and Integration requires the active involvement of key stakeholders at all levels. For government actors, this includes the national, provincial, district and village levels. Among societal groups, communities, local NGOs, academics and businesses must also participate. In terms of areas, policies, programs, and activities should encompass upland, lowland, coastal and marine ecosystems. This approach recognises that various actors pursue their own objectives, but through good governance, it enables and fosters common values and collective objectives.

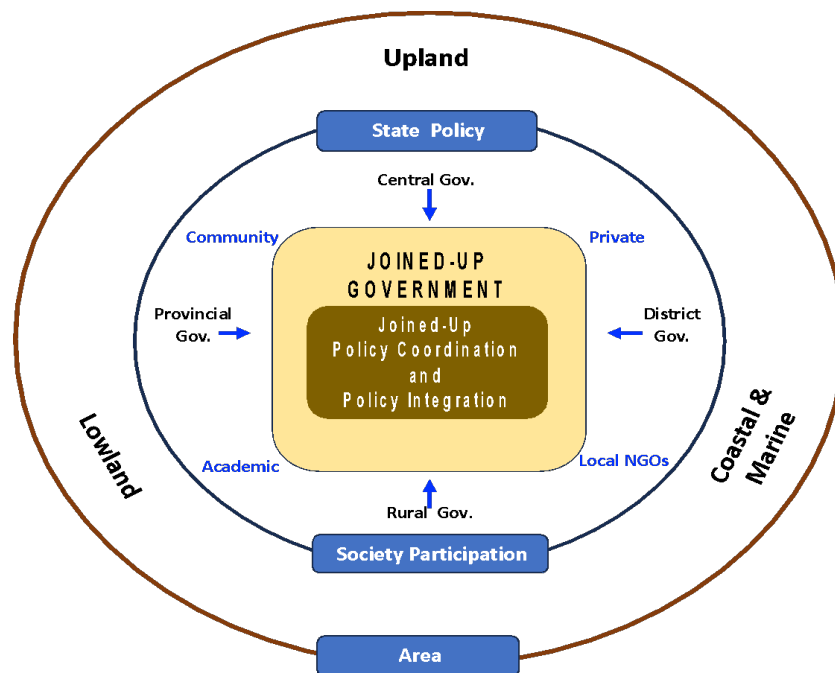


Figure 1: Joined-up Government Framework for Ridge to Reef Sustainable Natural Resource. Source: Authors' synthesis

Sustainable Finance

Sustainable Financing entails a stable and diverse financial portfolio to support conservation by covering costs through short- and long-term revenue streams. It addresses funding gaps by involving stakeholders benefiting from or affected by the area's ecological services (Gallegos et al., 2005). Financial sustainability in this context means securing sufficient, stable, long-term funding and allocating it effectively to manage conservation goals efficiently (Emerton et al., 2006). It is also a general term for finance that integrates and promotes both environmental and social objectives through products and mechanisms that fund activities that drive environmental outcomes.

As sustainable finance has potential to support alternative paths to economic development through sustainable natural resources management (KPMG 2023), it is a relevant enabler of the R2R approach in Southwest Papua. Private sector investments in financing (Fu et al. 2024) infrastructure (transportation, energy, water, waste and telecommunications), social improvements (health, education, public buildings and cultural facilities), and environmental restoration (green space, ecosystem restoration project and sustainable development project) can further achieve R2R outcomes.

However, IPLC in Southwest Papua - as with much of the world - face significant barriers to accessing global sustainable finance, limiting the impact and reach of local conservation efforts. Although Indigenous peoples are vital custodians of at least 32% of the world's land and are effective managers of biodiversity even when conservation is not the primary purpose (Schuster et al., 2019; Corrigan et al., 2018), financial mechanisms are often inaccessible to them. While the Global Biodiversity Framework (GBF) recognises the importance of IPLC in meeting its conservation mandate, key challenges for IPLC to access investor capital and deliver on this include (UNEP FI, 2022):

- a lack of appropriate legal frameworks to recognise land rights;
- weak governance;
- exclusion; and
- limited capacity for community-led monitoring and enforcement.

It's also noted that sustainable investment for IPLC should be treated sensitively. As debt instruments, if payback mechanisms for investments are not adequately managed and negotiated, they can further exacerbate financial disadvantage to IPLC (Knicley, 2012).

These broad global challenges are evident amongst Raja Ampat and Sorong's IPLC communities, who often struggle to produce competitive funding proposals that meet donor requirements (Interview). While organizations like Lembaga Masyarakat Adat (LMA) and Aliansi Masyarakat Adat Nusantara (AMAN) can navigate these processes, many local indigenous groups or women's groups often rely on assistance from external NGOs - indicating a gap in the community's capacity for self-sufficiency in fundraising efforts.

Another major constraint is limited access to information regarding funding opportunities, with many communities lacking awareness due to minimal outreach from donor organisations. For

instance, opportunities for funding tuna fishery product management and marketing are often not communicated to local groups, restricting their ability to access finance that could support their sustainable development initiatives. To address these issues, conservation NGOs such as Yayasan Konservasi Alam Nusantara (YKAN) and the Southwest Papuan Government through the Department of Maritime Affairs and Fisheries Service have provided training to Indigenous community leaders on proposal writing and communication with donors, aiming to empower them to seek funding independently in future.

These contextual findings highlight the need for improved financial readiness and capacity among IPLCs to manage funds effectively as well the need for financiers to better adapt their granting or investment requirements to a level that IPLC-led conservation efforts can work with. They also highlight the key interdependence between Joined-up Government and Sustainable Financing - as in order to strengthen sustainable finance, an institution is needed to manage and coordinate funding, integrate policies, and ensure accountability. This institution would facilitate collaboration among international agencies, governments, private sectors, and communities, promoting equitable and effective R2R implementation.

3. Material and Methods

This study employed a mixed-methods approach to explore the complexities and dynamics of natural resource management and its intersection with social inclusion and community rights in Southwest Papua. We conducted field data collection between September 2023 and July 2024, integrated qualitative and quantitative methods including semi-structured interviews, focus group discussions (FGDs) and validation workshops.

Semi-Structured Interviews were conducted with diverse stakeholders (80 people in total; 56 men and 24 women) representing government agencies, NGOs, communities (including male and female local leaders), local businesses, and private entities. These interviews captured diverse perspectives on current R2R management, noting different perspectives across gender and disability, the role of Indigenous knowledge, and alternative development narratives. A mix of closed and open questions were asked, allowing for participants to provide responses across question types.

Seven FGDs were held with mixed-gender and only-women groups to explore the impacts of climate change, the varied social and ecological outcomes of policy implementation, and perspectives on GEDSI. Additionally, validation and final workshops were organized at the end of data collection to present preliminary findings to key stakeholders in Southwest Papua. The validation workshop involved participation from 16 individuals across stakeholder groups including representatives of local government (8 people), NGOs (4 people) and community (4 people), and facilitated feedback on the study results and provided an opportunity to refine the findings based on stakeholders' suggestions.

4. Proposed Governance Framework

4.1 Evaluating the existing governance

The results of interviews and FGDs with a number of sources in Southwest Papua can generally be concluded that Joined-up coordination so far has been more in the form of "socialization" (*sosialisasi*) of the Functions of Planning, Protection and Community Empowerment. Meanwhile, sharing information and building a commonality of cognition (Joined-up Policy Coordination) has generally not been implemented, because sectoral egos are still dominant (FGD, May 2024).

Before the expansion of Southwest Papua province, the parent province of West Papua already has a Special Regional Regulation (Perdasus) on Sustainable Development stipulated in 2018. This is relevant in the context of Joined-up policy integration, because the document effectively regulates spatial planning. However, the Regional Regulation on Sustainable Development cannot be operationalized in both provinces as there is a disconnect between the document and policy at the provincial to district government level (Interview with an academic, May 2024). At the program and activity implementation stage, Joined-up Policy Integration has not yet occurred. This can be seen clearly from interviews (May 2024) that the implementation of community empowerment programs by Regional Government, NGOs and the Private Sector lack coordination and synergy. If Joined-up Policy Integration could be created, the community empowerment program could achieve more optimal results, especially if the actors involved could complement each other. For instance, if public service programs (e.g. health, education, economic supports) have not been able to reach certain areas due to access and budget limitations, they can be filled by community empowerment programs from other actors such as NGOs and the private sector.

Overall, based on FGD and stakeholder interviews, Joined-up policy coordination and policy integration has not been implemented due to the following factors: the dominance of sectoral egos, regulatory constraints, and communication (socialization) constraints. For example, the Regional Regulation on Sustainable Development which already exists, but has not been published or followed up in the Regional Spatial Planning (RTRW) and Regional Medium- and Long-Term Development Plans (RPJMD/RPJPD). In addition, institutional mechanisms that prioritize inclusive decision-making are essential to bridge these problems, ensuring that marginalized groups, including women and Indigenous Peoples, are actively involved in resource management and benefit-sharing processes.

To overcome this, it is necessary to establish a forum that allows representatives from the Regional Government, Indigenous Communities, NGOs and the private sector to sit together, carry out Joined-up policy Coordination in implementing the Natural Resources Management Planning function, and Joined-up Policy Integration in implementation of the Protection function and Community Empowerment function (Interview with academic and local government official, May 2024). Meanwhile, according to the sources, the appropriate R2R governance model in Papua cannot only emphasize economic and ecological aspects (as is done in other regions), as there is also a very strong need to fulfill social aspects (FGD, July 2024).

4.2 Regulatory Opportunity

In the context of existing regulations, it is highly feasible to strengthen R2R institutions (Table 1). The uniqueness of Papua has been recognized by the Indonesian government, through the issuance of Law Number 21 of 2001 concerning Special Autonomy for the Papua Province, which was subsequently amended by Law Number 2 of 2021, which allows Papua to create a special regional regulation (*Peraturan Daerah Khusus/Perdatus*). This regional regulation can be made different from national policy, provided it is in accordance with the principle of special autonomy, and in the Papuan contextual pillars of indigenous people's rights, natural resource management and specific governance arrangements, are open to adaptation and development. The authority to form and ratify *Perdatus*, based on Government Regulation Number 7 of 2021 concerning Special Autonomy for Papua, requires approval from the Papuan People's Representative Council (DPRP) and the Papuan People's Assembly (MRP), and the cultural representation institutions of the Papuan indigenous people. *Perdatus* can be drafted and cover the following things such as the rights of indigenous peoples, management of natural resources, education and health, protection of the rights of indigenous Papuans, and a local government system that is appropriate to the unique conditions of Papua. Thus, the formation of a *Perdatus* related to natural resource management, especially for R2R protection, which is in line with the local knowledge of indigenous Papuans, is very open.

Table 1: Several *Perdatus* (Special Regional Regulation) as Pillars to Realize R2R

No	<i>Perdatus</i>	Main content and Purpose
1	<i>Perdatus</i> No. 21 Tahun 2008 tentang Pengelolaan Hutan Berkelanjutan di Provinsi Papua (Regional Regulation No. 21 of 2008 concerning Sustainable Forest Management in Papua Province)	<p>Main Content: This <i>Perdatus</i> regulates sustainable forest management, taking into account environmental sustainability and the involvement of indigenous communities in managing forest resources.</p> <p>Objective: Protect biodiversity and maintain the balance of forest ecosystems in Papua and ensure that indigenous communities who depend on forests are involved in decision-making processes and benefit from sustainable forest management.</p>
2	<i>Perdatus</i> No. 23 Tahun 2008 tentang Hak Ulayat Masyarakat Hukum Adat dan Pemanfaatannya di Provinsi Papua (Regional Regulation No. 23 of 2008 concerning Ulayat Rights of Customary Law Communities and Their Utilization in Papua Province)	<p>Main Content: This <i>Perdatus</i> confirms the rights of customary law communities in the use of land and natural resources located in their customary territories. <i>Perdatus</i> No. 23 of 2008 presents a significant opportunity to advance equitable benefit sharing for indigenous communities in Papua Province by recognizing and formalizing their ulayat (communal land) rights. By enabling communities to co-manage resources, negotiate revenue-sharing agreements, and protect against exploitation, the regulation promotes economic equity and long-term sustainability. To maximize its potential, clear benefit-sharing mechanisms, capacity building, and inclusive decision-making are crucial. Partnerships with external stakeholders and strong monitoring systems can further empower indigenous communities to achieve fair economic, social, and environmental benefits.</p> <p>Objective: Ensure that land and resource use is carried out in a sustainable manner, by involving indigenous communities and</p>

No	Perdasus	Main content and Purpose
		paying attention to aspects of environmental sustainability and their traditional rights.
3	Perdasus No. 25 Tahun 2013 tentang Pengelolaan Sumber Daya Alam Berkelanjutan (Regional Regulation No. 25 of 2013 concerning Sustainable Natural Resource Management)	<p>Main Content: This Perdasus regulates the sustainable use of natural resources in Papua, including regulations that prevent excessive exploitation of natural resources, especially in the fields of mining, forestry and fisheries.</p> <p>Objective: Protect the environment from damage due to exploitation and ensure that local indigenous communities obtain fair economic benefits from the use of natural resources.</p>
4	Perdasus No. 20 Tahun 2013 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (Regional Regulation No. 20 of 2013 concerning Environmental Protection and Management)	<p>Main Content: This Perdasus regulates environmental management in Papua by taking into account the principles of sustainable development. This regulation focuses on waste management, pollution prevention, and conservation of natural resources.</p> <p>Goal: Create a framework that supports environmental conservation, reduces the impact of ecosystem damage, and regulates waste and pollution management for more sustainable development.</p>

Source: Authors' analysis

4.3 Proposed Institution and Governance Arrangement

The data and information resulting from the research findings above clearly indicate the urgency of actualizing R2R governance. Therefore, we propose a R2R governance model based on the Joined-up Government concept, through the establishment of what we call the 'Ridge to Reef Development Collaboration Agency for Southwest Papua Province' (BKPR2R-PPBD) (Figure 2).

The BKPR2R-PPBD will act as the core institution in the governance framework for R2R. This agency consists of representatives from local government, local community, NGOs, academics and private actors. The BKPR2R-PPBD model aligns with national policy initiatives aimed at accelerating development in Papua. Specifically, it complements the objectives of Presidential Regulation No. 121/2022, which created the Steering Committee for the Acceleration of Special Autonomy Development for Papua (BP3OKP), a non-structural institution designed to synchronize and coordinate special autonomy development in Papua. The institutional structure of the West Papua Development Collaboration Agency can be seen in the Figure 2:

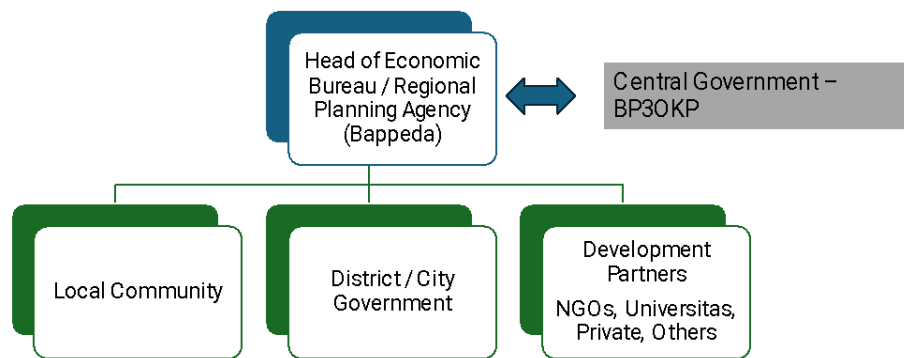


Figure 2. The structure of proposed BKPR2R-PPBD.

Source: Adapted from interviews and FGDs.

The BKPR2R-PPBD emphasizes equitable benefit-sharing to ensure local communities, especially women and marginalized groups, actively participate in, and benefit from, sustainable resource management. To achieve this, the agency needs to integrate localized performance standards, co-designed with women, Indigenous peoples, and persons with disabilities, reflecting their priorities, cultural values, and environmental needs. These standards will guide project planning and implementation, focusing on gender-sensitive outcomes, equitable resource access, and meaningful participation.

The BKPR2R-PPBD needs to provide continuous support from the design phase to project incubation, ensuring community readiness and long-term sustainability. Transparency will underpin its operations through regular reporting on financial allocations, outcomes, and progress, supported by forums for dialogue and grievance redress. A dedicated seed fund management unit, aligned with equity and sustainability goals, will further foster trust, collaboration, and inclusive development.

In the context of Southwest Papua, where systemic inequalities in resource access persist, women face barriers such as restricted land access and economic benefits due to patriarchal norms and male-dominated customary rights, while people with disabilities are excluded from decision-making processes. To address these gaps, localized performance standards must reflect traditional ecological practices like *hak pakai* (right to use) and *hak makan* (*right to eat*), which embody sustainable resource management. By addressing these challenges, the BKPR2R-PPBD can advance inclusive, equitable, and sustainable governance from ridge to reef.

To address the broader ecosystem of administrative jurisdictions across districts, R2R institutions should ideally be managed by the provincial government, with the governor serving ex officio and operations led by the regional secretary under the economic bureau. This structure ensures the R2R program is included in the Regional Medium- and Long-Term Development Plans (RPJMD/RPJPD) and implemented through regional agencies. Acting as an R2R hub, this agency will coordinate resources, programs, and activities to improve focus and efficiency, addressing issues like low budget absorption and poor planning. Guided by a HITS (holistic, integrative, thematic, spatial) approach and demographic considerations, the agency will emphasize transparency, collaboration, equity, local wisdom, and grassroots engagement.

Transitioning from the current organizational model to a joint management (joined-up government) approach must be done gradually, as building strong coordination requires time and a learning curve (FGD, September 2024). Shifting from sectoral interests (ridge and reef) to shared goals (ridge to reef) depends on fostering trust among all actors. Therefore, taking small, consistent steps together is more effective and valuable than pursuing large but unsustainable changes.

The key to building synergy among stakeholders is linking them through interrelated performance indicators (interdependency key performance indicators). This approach ensures stakeholders collaborate on a cohesive series of activities rather than fragmented efforts. To achieve this, the study proposes establishing a Ridge to Reef Development Collaboration Agency for Southwest Papua Province (BKPR2R-PPBD) under the legal framework of Special Regional Regulations (Perdasus).

Based on the Joined-Up Governance concept, the BKPR2R-PPBD serves two key functions: Joined-Up Policy Coordination and Policy Integration across four main areas such as Social, Economy, Environment, and Sustainable Financing. Joined-Up Policy Coordination involves fostering collaboration among institutions and stakeholders to enhance information sharing, dialogue for building shared understanding, program planning, and decision-making for policies and activities related to Ridge-to-Reef (R2R) governance. Policy Integration focuses on ensuring the collective implementation of agreed-upon decisions through coordination, monitoring, evaluation, and enforcement of sanctions when necessary. Together, these functions aim to create a cohesive and efficient approach to managing R2R governance.

Implementation of BKPR2R-PPBD will be supported by four interrelated unit such as: program and planning activity unit; program and activity implementation unit; monitoring and evaluation unit; and seed fund management unit. As one of the subordinate/units of the BKPR2R-PPBD, the existence of the "seed fund" management institution for sustainable regional development is expected to carry out two main functions, including: a) to coordinate sources of financing from various stakeholders, and b) to act as the final decision maker on the allocation of financing for the ridge to reef program/activities, in particular, and sustainable development, in general.

5. Proposed sustainable finance approach

5.1 Evaluating existing financial mechanisms

Table 2 outlines the existing range of sustainable finance mechanisms. and their benefits currently in Southwest Papua.

Table 2: Sustainable finance mechanisms currently present in Southwest Papua Province

Mechanism	Description	Example in Southwest Papua	Benefits
Market-based Payment for Ecosystem Services Example of financiers: Private sector, Philanthropy, SMEs	<p>Market-based payments for an available ‘service’ or ‘asset’ provided by nature.</p> <p>The difference with environmental markets, is that these services are not ‘traded’ to offset an ecological or carbon emissions impact elsewhere - rather financing goes directly to maintaining the value of the ecosystem.</p>	<p>Entrance Fees for the Raja Ampat Marine Park are managed by Regional Public Service Agency Technical Implementing Unit (Badan Layanan Umum Daerah Unit Pelaksana Teknis Daerah / BLUD-UPTD). Users pay for the ecosystem services they utilise (ecotourism), which directly places a value on the environment, and ensures local governments and communities are incentivised to conserve the environment to keep the revenue stream alive.</p>	<ul style="list-style-type: none"> ● Improved well-being of Indigenous Peoples and Local Communities ● Healthier marine habitats ● Healthier coastal habitats ● Reduced emissions
Debt-for-Nature Swaps Example of financiers: Bilateral Aid	<p>An arrangement at the national level where a proportion of a nation's external debt is absolved in the condition that they commit to allocate equivalent resources towards domestic environmental preservation endeavours.</p> <p>As mechanisms for fiscal alleviation, these arrangements help economic relief and promote environmental sustainability.</p>	<p>US Government has allocated US\$15 million for the Tropical Forest and Coral Reef Conservation Act (TFCCA). Initial discussions between US and Indonesia are that GOI will be absolved of US\$18absolved US\$18 million in debt, which GOI will then redirect towards domestic conservation efforts. This includes accrued interests into the Blue Abadi endowment.</p>	<ul style="list-style-type: none"> ● Improved well-being of Indigenous Peoples and Local Communities ● Healthier marine habitats ● Healthier coastal habitats ● Reduced emissions
Philanthropic Grant Example of financiers: Philanthropic	<p>Philanthropy is charitable giving to worthy causes by individuals or organisations based on an ‘altruistic desire’ to improve human</p>	<p>The existing network of CSOs / NGOs in Southwest Papua are largely supported by philanthropic grants or sub-grants.</p>	<ul style="list-style-type: none"> ● Improved well-being of Indigenous Peoples and

organisations, Bilateral Aid	and/or environmental welfare. Large charitable gifts are often awarded as fixed-term grants. While in principle, philanthropy does not expect any finance in return (except for the tax incentives), they still expect improved and verifiable results for the worthy cause supported.	Given grant terms / cycles are quite short-term (~4 years or less), such CSOs / NGOs are often have to dedicate much of their time securing the next grant to continue operating. As such, philanthropy plays a key role in filling capital gaps but should not be relied upon for long-term, large-scale and ongoing projects.	Local Communities <ul style="list-style-type: none"> ● Healthier marine habitats ● Healthier coastal habitats ● Healthier terrestrial habitats ● Reduced emissions
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Source: Authors' analysis

Raja Ampat - and Indonesian Papua's Bird's Head Seascape more generally - has a broad funding basis from government budgets, tourism (via a marine park entrance fees managed by BLUD-UPTD), grants from philanthropic donors - most notable of which is the Blue Abadi Fund - and corporate social responsibility initiatives, fines for illegal fishing and a Debt-for-Nature-Swap deal between the US and Indonesia announced in July 2024. Focusing on Southwest Papua's marine and coastal environments, they provide a solid foundation for conserving R2R and offer a path to engage local stakeholders and prioritise new conservation funding to land-based activities. Tiku et al. (2022) note the success of tourism-related revenue in Raja Ampat promotes accommodation and food services contributes significantly to the income and employment of local agricultural and fisheries workers - improving local livelihoods and reducing regional poverty.

While there is currently no equivalent finance mechanism for sustainable and equitable terrestrial conservation, taking an integrated strengths-based approach to build on what already exists can help stakeholders in Southwest Papua to address this gap for sustainable land management (**Figure 3**). One clear opportunity includes expanding the Regional Public Service Agency Technical Implementing Unit (BLUD-UPTD) to also manage terrestrial ecosystems. The collective experience on these marine-conservation-based finance mechanisms also brings considerable value to the R2R approach. For example, the Blue Abadi Fund conservation trust initially depended on half of its funds from one single donor from 2004-2013 (Browne et al. 2022). In response to this vulnerability, the Blue Abadi Fund partners transitioned to a more diversified funding model to ensure it was no longer over reliant on one single source of funding.

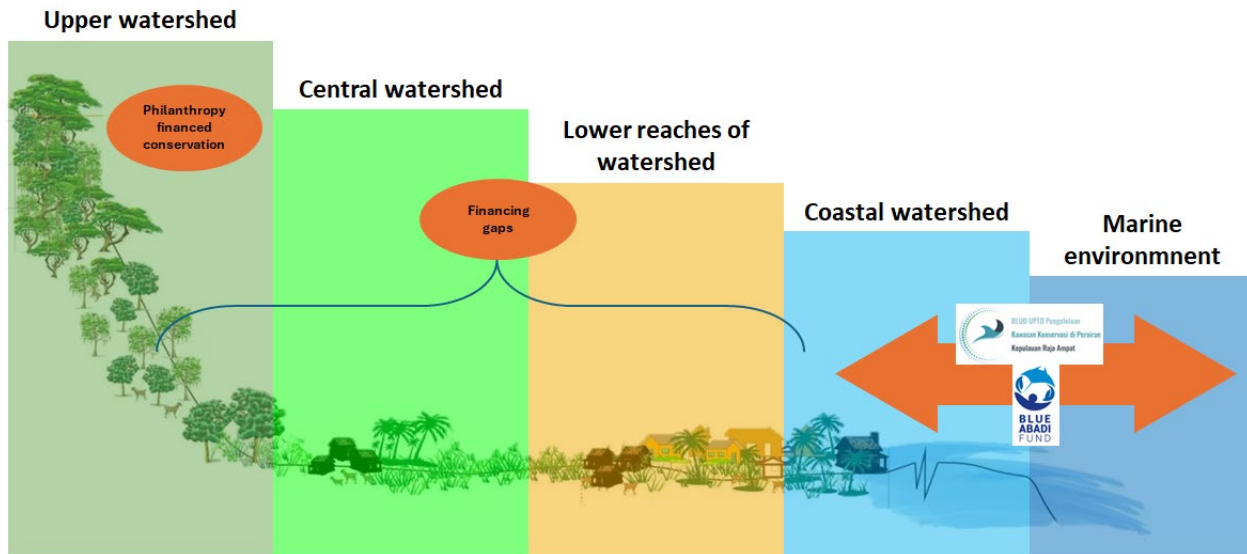


Figure 3: The extent of existing sustainable finance in Southwest Papua is concentrated on the ocean and coast, with some small-scale conservation activities on land. Understanding how this occurs in the R2R geographic unit helps decision-makers in Southwest Papua. Source: Adapted from interviews with key stakeholders.

5.2 Opportunities for R2R Sustainable Financing

A sustainable financing model can be taken with a blended finance approach that combines existing sources, like the recent Debt-for-Nature Swaps, with philanthropic funding to build capacity and readiness for a Results-Based Payments for Ecosystem Services scheme. While this requires careful planning and significant effort, it aligns well with the R2R conservation and sustainable development vision. This approach emphasises deep and inclusive stakeholder engagement and participation, which is core to the proposed joined-up government reforms through BKPR2R-PPBD, while also making R2R conservation in Southwest Papua more attractive to funders.

a) Blended Finance is crucial to ensuring a diversified approach to financing R2R Management

A diverse blend of local, national and international funding helps cushion the risks of being too over-reliant on a single source of funding (IISD, 2022; Cumming et al, 2021). Noting the significant opportunity to grow finance sourced from the private sector, incentivising this requires establishing a robust, investment-friendly environment through standardized regulatory frameworks. This emphasises the important role of governments in preparing clear legal obligations that the project provides adequate benefits for sustainability and value creation (Shiiba et al. 2022). With Joined-up Government, better allocation of financial resources can be achieved, especially through the use of innovative financial tools that blend finance from both public and private sources (Shiiba et al. 2022).

Blended and diversified financing can enhance value creation and provide reliable, long-term support for R2R conservation. A study by IISD (2022) on peatland and mangrove restoration in Indonesia found that "packages of interventions", rather than isolated measures, significantly improve conservation project success. For example, the Katingan Mentaya project in Central Kalimantan demonstrated that combining multiple funding sources with interventions like canal blocking, tree planting, financed fire suppression, and monitoring activities maximized benefits while preventing forest conversion to plantations and mining. In the Belitung Mangrove Park, long-term mangrove ecosystem rehabilitation was further supported by revenue generated through ecotourism. Similarly, Tranter et al. (2022) highlighted the Coral Reef Rehabilitation and Management Program (COREMAP), led by MMAF and financed by the World Bank and Asian Development Bank, which established a "seed fund" enabling village organizations and individuals to access start-up loans, fostering business growth and investment viability.

Other successful examples of diverse funding approaches include long-term funding for ongoing management and salaries; short-term funding for specific projects; and cyclical funding, such as seasonal tourism revenue, to supplement budgets (Cumming et al., 2021). **Figure 4** outlines a potential structure for a jurisdictional blended finance mechanism for Southwest Papua that can enhance existing finance, while leveraging the recommended BKPR2R-PPBD structure.

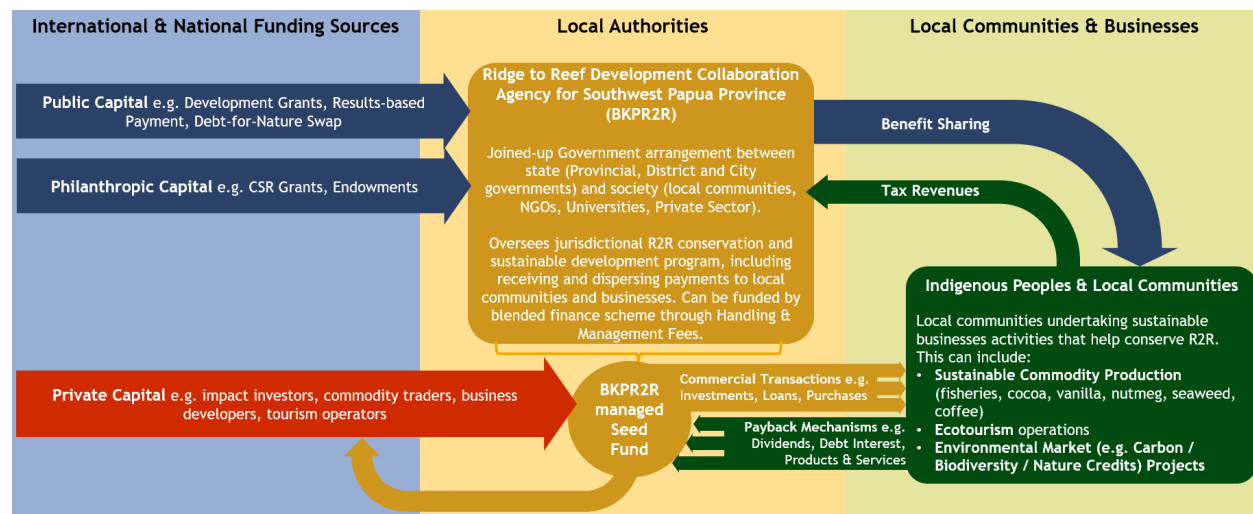


Figure 4: An example of how a blended finance approach for R2R conservation and sustainable development in Southwest Papua can be harmonized with the BKPR2R structure (including management of a seed fund), utilising different sources of private, public and philanthropic funds. Source: Adapted from interviews and FGDs.

b) A Results-Based Payment scheme for Southwest Papua's intact nature - especially forests - can significantly enhance R2R outcomes

Results-based Payment schemes can provide significant value for conserving Southwest Papua's intact forests, which are essential for biodiversity preservation, carbon storage, and community livelihoods. Noting the finance gap supporting terrestrial conservation in Southwest Papua, the provinces' 1 Million ha of intact tropical forest landscapes offers an untapped source of finance

(Potapov et al. 2017; TNC 2024). Intact tropical forests, which are relatively untouched by human development, generally have the highest level of biodiversity, have greater adaptive capacity and store up to 35% more carbon than regrowth and degraded forests (Watson et al, 2018; Seymour et al, 2023; Mackey et al 2023). Yet as part of global efforts to halt deforestation and promote reforestation, there is limited action, policy, or finance for preserving the world's remaining intact forest landscape - with climate finance currently designed to reward jurisdictions with high deforestation to incentivise restoration and additionality.

Additionally, protecting intact forests can support sustainable development for local communities, who often suffer low human development indicators (Mackey 2020; Mumbunan et al, 2021; Watson et al, 2018). Southwest Papua has the rare opportunity to leverage forest conservation as a pathway to sustainable development with a results-based payment scheme to create a revenue stream that benefits both biodiversity and people whose culture and livelihoods depend on forests.

c) Environmental Markets can be a new supplementary source of funding for R2R in Southwest Papua

Emerging environmental markets, such as carbon credit systems, are a key intervention needed to reduce emissions in line with the Paris Agreement and can also create sustainable revenue to natural-capital rich communities and jurisdictions (COICA et al, 2022; TNC 2024). In addressing the terrestrial financing gaps in Southwest Papua, environmental markets can offer additional funding for sustainable land management, especially in the adjacent 'buffer' areas to protected landscapes (Deutz et al., 2020; Cumming et al, 2021). However, given the relatively low-cost for a carbon credit and the current volatility of pricing and demand, Environmental Markets should be viewed as a supplement - rather than sole source - to a broader sustainable finance approach (Cumming et al, 2021).

It is key to note that many carbon credit projects - especially in tropical forest areas - suffer from poor governance, lack of integrity and misunderstood technicalities which limit their effectiveness, reputation and confidence (COICA et al, 2022). Further, some Indigenous groups in Indonesia have criticized the emerging national legislation on carbon exchange, as they place too much control with Government while not adequately considering the key role Indigenous communities play in forest protection (AMAN, 2024).

However, the growing awareness and lessons from carbon markets to date provide a unique opportunity for Southwest Papua and Indonesia more broadly which have yet to officially adopt a national carbon market. To build a competitive position in the global environmental market and source of high-quality credits, Southwest Papua can embrace a jurisdictional approach for:

- High integrity carbon credit standards - with the Tropical Forest Credit Integrity Guide for Companies by COICA et al, 2023 a recommended framework;
- Inclusion of IPLC in the ownership, design and delivery of projects; and
- Transparency in monitoring, results and verification (Seymour 2020; COICA 2023).

This strategy could enable Southwest Papua to attract supplementary funding for R2R conservation, although reliance on environmental markets alone is unlikely to fulfill the long-term financing needs for sustainable R2R management.

d) Decision analysis can be utilised to ensure bottom-up design of a sustainable mechanism

Ultimately, creating a sustainable financial mechanism for Southwest Papua must be driven by local perspectives, and community involvement and co-ownership should be integrated into its design from the onset. Decision analysis frameworks are increasingly used to manage and inform complex environmental decision making and can be valuable for aligning, balancing and reconciling stakeholder goals and objectives (Hemming et al, 2021; Tranter et al, 2022). They also help embed local perspectives (including considerations on culture and politics) on actions that can be financed, and how much funding is needed to make it happen. In this context, a decision analysis framework can help inform ideal R2R management in Southwest Papua by defining the problems, organising diverse stakeholder objectives, and scoping alternative approaches by estimating consequences and trade-offs from different management strategies. If facilitated by BKPR2R-PPBD, it can empower and build local capacity to define and design a bespoke approach to govern and benefit from inclusive R2R management (**Figure 5**).

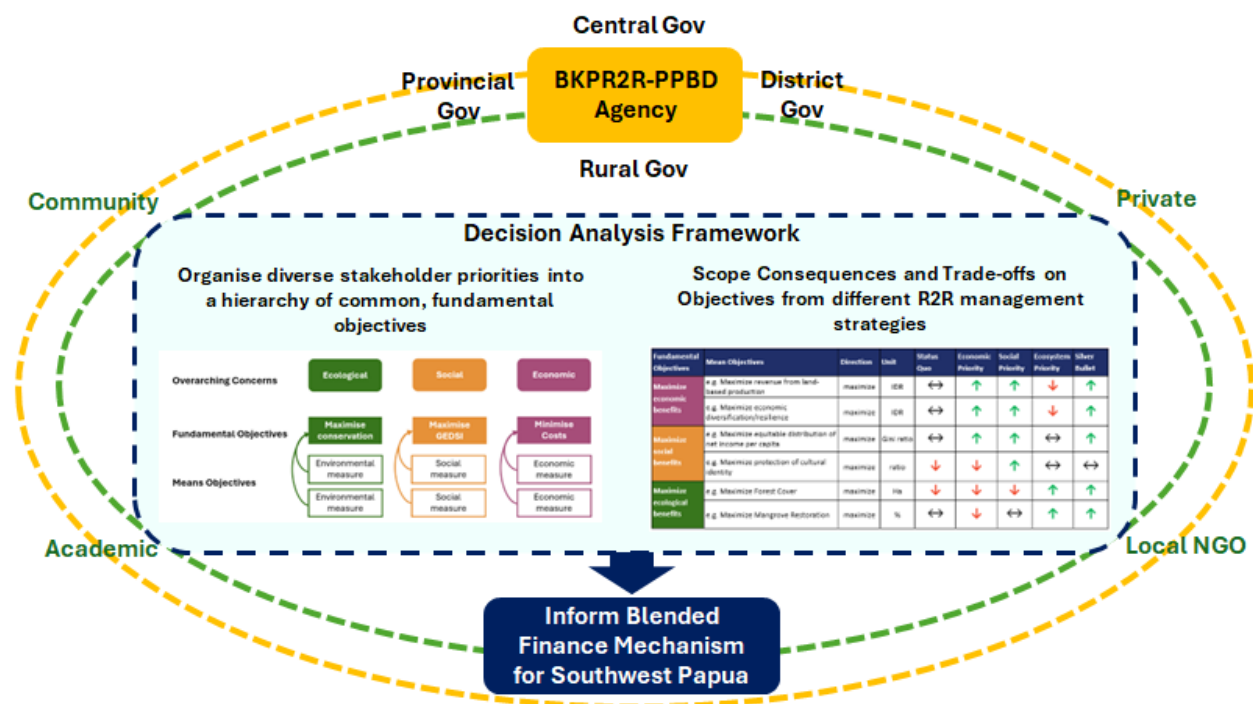


Figure 5: A proposed decision analysis framework which can empower local perspectives in designing a sustainable finance approach (such as the blended finance mechanism in Figure 4) for stronger R2R outcomes within the BKPR2R-PPBD arrangement. Source: Adapted from interviews and FGDs.

6. Discussion

Our study highlights the critical need for an integrated R2R governance and sustainable finance mechanisms in Southwest Papua. This approach is crucial to address the existing fragmented governance system, inadequate financial mechanisms, and a lack of effective institutional coordination. The proposed BKPR2R-PPBD agency, inspired by the Joined-Up Government framework, was proposed to address these gaps by integrating policy coordination and policy integration. This model will be better able to formalize engagement strategies with stakeholders, where in the previous study Vozzo et al (2024) saw a more informal approach pattern.

Additionally, we proposed a blended finance to support a jurisdictional results-based payment scheme as a viable financial strategy to address funding gaps while promoting equitable resource sharing and biodiversity conservation. This scheme is quite innovative as a new financial instrument that is able to scale up financing facilities that are aligned with the aim of making sustainable livelihoods more easily achieved and commercially viable as investable businesses. Such an arrangement will also make it easier to respond to the distributive impact of a policy on the most vulnerable groups, or those who will be directly affected by ecological zone management.

The findings underscore the inherent complexity of implementing R2R governance, particularly due to diverse actors, contexts, and objectives involved. Policy integration and coordination, as main components of joined-up government, face significant challenges in balancing economic, social, and ecological objectives. Conflicts between these objectives can threaten the livelihoods of local communities, emphasizing the need for robust institutional arrangements and governance models. This study also shows that traditional and indigenous organizations, when supported by government initiatives, can play a pivotal role in sustaining R2R governance, leveraging a customary property rights regime to foster ecological resilience and social equity.

The study provides significant insights into the potential of institutional harmonization to align formal governance systems with sustainable local practices. Good leadership emerges as a critical factor for building trust and achieving R2R unity at both community and government levels. Strengthening local leadership capabilities and developing collective key performance indicators (KPIs) can compel state actors at all levels to work together across sectors. Additionally, integrating R2R ecosystems into a public goods framework reveals the need for government intervention to overcome free-rider problems and underinvestment, as emphasized by Emerton et al. (2006) and Gallegos et al. (2005). Sustainable financing, therefore, is essential for fostering collective action and securing the high positive externalities offered by R2R ecosystems.

To strengthen the position of R2R governance and ensure that the complexity of the R2R system can be controlled, the existence of an R2R management body is very important. Experiences in several countries such as the Philippines (Andales-Escano 2015) and the Cook Islands (Pacific R2R 2022) show how R2R institutions have compromised various sectoral egos and provided benefits for sustainable development. This agency will also ensure that a holistic approach can be maintained better, noting Chile's experience with Integrated Coastal Zone Management (ICZM), difficulties in improving human welfare and protecting socio-ecological systems in the long term, due to a lack of using a holistic approach (Vázquez Pinillos, et al, 2024). With more advanced R2R

governance, strengthening community economic resilience can be achieved with minimal impact on environmental conditions.

Despite its contribution, this study has some limitations, particularly its focus on Southwest Papua and its reliance on qualitative data, which may not fully capture the economic (e.g. financial flows) and social nuances of R2R governance in broader contexts. Moreover, while the proposed institutional framework and financial strategies are tailored to local conditions, their implementation depends heavily on political will and stakeholder collaboration, which remain unpredictable. Finally, we need to test the proposed institutional and financial model by gradually expanding the regional business services agency (BLUD) by the provincial government, to not only handle marine, but also terrestrial ecosystems.

7. Concluding remarks

The Ridge to Reef approach to development has deep roots in the culture of the Indigenous people of Southwest Papua, reflecting their intrinsic connection to the land and sea. This study demonstrates that harnessing this cultural foundation can provide a pathway to more sustainable and equitable development in Southwest Papua. However, the fragmented governance model and sectoral egos, has made traditional R2R increasingly marginalized. This can be seen from the construction of regional regulations which have not been able to adapt the R2R concept, as well as the challenges in existing mechanisms, such as the BLUD governance framework, highlight the need for more inclusive and integrated solutions.

This study suggests that Southwest Papua needs to have an autonomous R2R institution, what we call the BKPR2R-PPBD. By extending the BLUD model to encompass broader ecosystem coverage and integrating a seed funding unit, the BKPR2R-PPBD becomes a cornerstone of sustainable R2R governance. Institutionally, BKPR2R-PPBD would foster collaboration, a more integrated, holistic, inclusive and sustainable R2R governance model. This institution will also be better able to seek new sources of financing through the formation of a seed fund unit.

In order for BKPR2R-PPBD to be formed and work well, leadership from the provincial government is needed, with support from the district government, the community and development partners. The process of building a sense of trust and shared responsibility for protecting the ecosystem is an important prerequisite for this institution to work well.

To translate these recommendations into actionable outcomes, engaging stakeholders at all levels is essential. Embedding community participation from the outset and building local capacity to understand the complexities of sustainable development decisions are critical steps. Practical implementation should be tailored to local contexts, leveraging insights from focused group discussions to ensure relevance and effectiveness. Immediate action is timely, given the climate urgency, the political context of newly established Papua provinces, and the evolving focus of international donors on addressing current gaps in climate and sustainable finance.

Key steps include mapping stakeholder objectives, co-developing a shared vision for R2R management, and establishing robust governance and financial arrangements. Institutional readiness must be prioritized, aligning R2R objectives with national and international

commitments like NDCs and the Global Biodiversity Framework. Sustainable funding mechanisms, including performance baselines, monitoring systems, and equitable benefit-sharing arrangements, are essential to operationalize these strategies.

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