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Tradeoffs and synergies in community-centered conservation

Evidence from participatory impact assessments

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Planet Indonesia (PI) tackles the tragedy of the commons in tropical ecosystems. Their holistic, rights-based model supports Indigenous Peoples and local communities through territorial rights, inclusive governance, ecosystem management, and access to finance and healthcare. PI works through long-term partnerships with community groups and prioritizes scaling through supporting locally rooted CSOs. They provide funding and technical support to Indonesian partners, working to strengthen a thriving civil society network.

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Cover photo: Aerial view of a rural landscape in West Kalimantan, by Planet Indonesia.

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Conflict of interest statement

Authors PT, AA, R, H, NS, and AM are affiliated with the NGO whose program is evaluated in this paper. While this relationship has not influenced the findings or interpretations presented, the authors disclose this affiliation in the interest of full transparency. We are not aware of any other potential conflicts of interest.

Authors' contributions statement

Paul Thung led the writing of the manuscript; Adam Miller conceived the ideas, designed the methodology, and analysed the data; Rodiansyah and Hendra supervised the data collection; Abrar Ahmad, Rachel Carmenta, Jacob Phelps, Aiora Zabala, Muflihati, and Siti Kartikawati contributed to writing, review, and editing of the manuscript. Novia Sagita supervised the research. All authors contributed critically to the drafts and gave final approval for publication.

Acronyms

CGBs	Community-led governance bodies
FGDs	Focus group discussions
ICDPs	Integrated conservation and development projects
ILIs	Integrated landscape initiatives
MSCs	Most significant change(s)
MSPs	Multi-stakeholder platforms
NGOs	Non-governmental organizations
PIA	Participatory impact assessment
YPI	Yayasan Planet Indonesia

Contents

Photo: Planet Indonesia

Executive Summary

1. As conservation efforts expand to meet global targets, it is crucial to ensure that these measures include and respect the Indigenous Peoples and local communities residing in these areas. This cannot be achieved by any single approach, but requires a portfolio of diverse tools and methods applied in contextually-appropriate ways. To enhance the evidence base on which approaches work best in which contexts, this paper evaluates an innovative conservation program in West Kalimantan, Indonesia. This program supports community-led governance bodies (CGBs) both to lead local conservation efforts and engage with external actors – an approach that integrates elements of Integrated Landscape Initiatives (ILIs) with community-centered approaches to conservation.

2. We present evidence from a participatory impact assessment (PIA) based on 20 focus group discussions (FGDs) with members of nine CGBs active in and around a nature reserve. The study aggregated FGD results to assess landscape level impacts in a way that takes local perceptions seriously and recognises the heterogeneity of impacts across different contexts and dimensions of human well-being.

3. CGB members ranked activities and outcomes that enhanced local socio-economic well-being as the most valuable to their lives – particularly those related to agriculture, financial security, and health. They also identified strong synergies between enhanced socio-economic well-being and environmental protection.

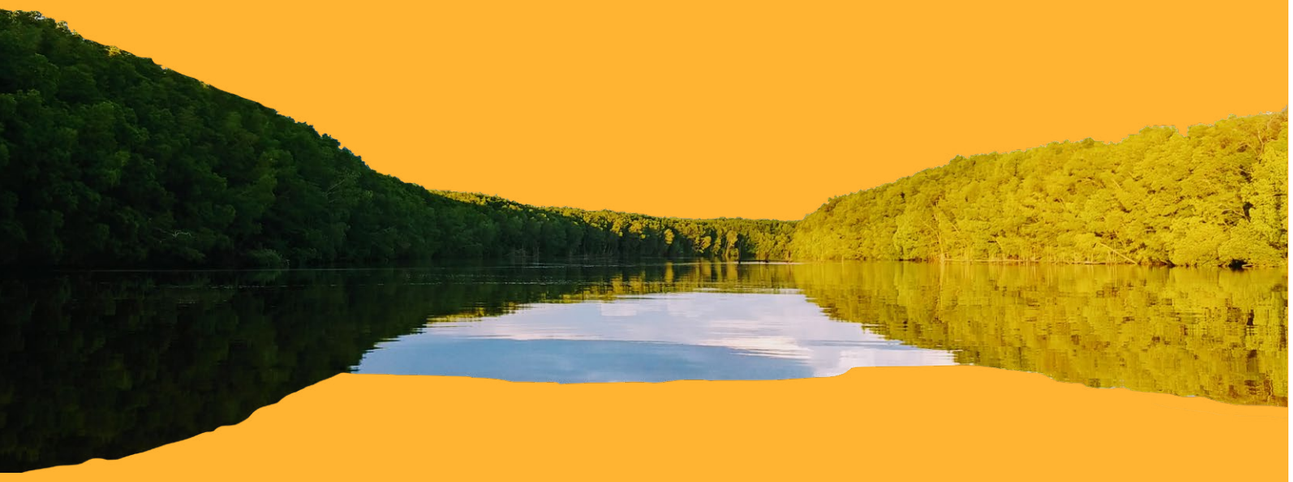
4. The study also identified capacity building and institutional development as critical elements for integrating community-centered approaches with ILIs, enabling local communities to effectively address interlinked socio-ecological challenges.

5. Synthesis and applications: Our findings underscore the importance of integrating environmental protection with socio-economic development. The study reveals the potential for community-led governance bodies to create synergies between different domains of well-being. We encourage conservation actors to consider replicating elements of this approach in other places. However, we stress the importance of adapting such efforts to the specificities of different contexts.

Keywords: Community-centered conservation, integrated landscape initiatives, community-led governance, participatory impact assessment, socio-economic development, Indonesia

Section 1

Introduction



In this section:

Photo: Planet Indonesia

Excluding people from nature has long been the approach to tropical nature conservation favoured by colonial and postcolonial governments and funding bodies. This approach has been repeatedly criticised for being ineffective, unjust, and based on empirically unsound assumptions about human-nature relations (Büscher & Fletcher, 2020; Dawson et al., 2023; Neumann, 1998; Rai et al., 2021).

At the same time, the many proposed alternatives – from Community-Based Conservation (Berkes, 2021) to Payments for Ecosystem Services (Wunder, 2013) – have also been criticized, for oversimplified assumptions about the homogeneity of local communities, focusing on economic efficiency, poor implementation, and more (Burivalova et al., 2019; Cebrián-Piqueras et al., 2023; Lele et al., 2010; Zhang et al., 2023). **Instead of trying to pinpoint a universal model for conservation, it is therefore more productive for practitioners to "sift through multiple good ideas, test those that are appropriate, and share our results"** (Redford et al., 2013, p. 438). In other words, we should better target actions by finding out what works where and why (Baylis et al., 2016; McKinnon et al., 2016).

Responding to such calls for diverse strategies and better evidence on conservation effectiveness, this paper analyses a participatory impact assessment (PIA) of a conservation program initiated by a non-governmental organization (NGO) called Yayasan Planet Indonesia (YPI). The PIA discussed here focuses on YPI's work with Indigenous Dayak communities living in and around the Gunung Nyiut Nature Reserve (henceforth "the Reserve") in West Kalimantan, Indonesia. YPI's program in the Reserve takes up important principles from Integrated Landscape Initiatives (ILIs), but moves away from ILIs' emphasis on Multi-Stakeholder Platforms (MSPs) to instead focus more strongly on supporting community-led governance bodies (CGBs), grounded in principles and mechanisms for centering Indigenous Peoples and local communities in conservation (Armitage et al., 2020; Berkes, 2021). With support from YPI, these CGBs selected and implemented various activities, including climate-smart agriculture and agroforestry, community patrols, collaborative zoning and spatial planning, biodiversity research, community healthcare, and education services.

Activities implemented by community-led governance bodies with support from Yayasan Planet Indonesia:

Climate-smart agriculture and agroforestry

Community patrols

Collaborative zoning and spatial planning

Biodiversity research

Community healthcare

Education services

Contributing to growing bodies of evidence supporting the effectiveness of ILIs (Carmenta et al., 2020; Estrada-Carmona et al., 2014; Reed et al., 2017; Riggs et al., 2021; Zanzanaini et al., 2017) and community-centered conservation (Cebrián-Piqueras et al., 2023; Persha et al., 2011; Zhang et al., 2023), this paper shows how capacity building and institutional development at the community level are key for realizing the intersectoral synergies that landscape approaches aim for. The paper also makes a methodological contribution by exemplifying the potential for PIA to assess conservation approaches at the landscape level in a way that builds on local perceptions and acknowledges the heterogeneity of impacts across different contexts and dimensions of human well-being (Bennett, 2016; Gill et al., 2019).

1.1 Combining approaches: Integrated Landscape Initiatives and community-centered conservation

ILIs are sustainability initiatives that aim to manage tradeoffs and synergies between competing demands on landscapes (Reed et al., 2016). **The primary rationale for this "landscape approach" is that the global challenges of biodiversity conservation, food production, poverty alleviation, and climate change mitigation are interlinked and cannot be addressed through narrowly sectoral or project-based interventions** (Pfund, 2010; Sayer et al., 2013). In comparison with earlier trends such as Integrated Conservation and Development Projects (ICDPs), ILIs are characterized by a greater emphasis on improving governance, which includes attention to local participation, capacity building, and iterative processes of negotiation, learning, and adaptation. Surveys conducted among ILI practitioners indicate that ILIs achieve positive change across conservation, agriculture, livelihoods, and institutional development (Estrada-Carmona et al., 2014; Milder et al., 2014; Zanzanaini et al., 2017) and that ILIs with high levels of integration between different sectors perform best (Carmenta et al, 2020). However, a challenge identified by practitioners working on MSPs is dealing with existing power imbalances, and a lack of engagement and buy-in from more powerful actors such as government agencies and extractive industries (Estrada-Carmona et al., 2014; Riggs et al., 2021; Zanzanaini et al., 2017).

A focus on CGBs incorporates aspects of the landscape approach, in that it:

1. Targets multiple objectives across social, environmental, and other domains,
2. Aims to improve landscape-level governance,
3. Involves coordination across different sectors, and;
4. Is highly participatory (cf. Novick et al., 2023).

However, since Indigenous Peoples around the Reserve and in Borneo more widely have long been marginalized, their low levels of negotiating power form a barrier to setting up an effective MSP. Based on extensive community consultations, YPI learned about the many interconnected challenges faced by the inhabitants of the landscape, for whom financial security, access to education and health services, sustainable livelihood opportunities, recognition of culturally-based land rights, and representative community organizations were all equally necessary. For community members to take an active role in landscape governance, therefore, it was not enough to offer them a seat at the table; local communities first required additional support in order to develop their positions and be able to negotiate meaningfully with more powerful stakeholders.

⟶ **A man throws a net for subsistence fishing**. Photo: Planet Indonesia.

In recognition of this context, the program integrates the landscape approach with community-centered conservation, which comprises a range of principles and techniques for improving the quality of local participation and leadership in conservation, from rights-based approaches to co-design (Campbell et al., 2023; Khanyari et al., 2023; Tauli-Corpuz et al., 2020; Thornton et al., 2020). While there is strong evidence to suggest that conservation outcomes are enhanced when Indigenous Peoples and local communities are leading conservation efforts (Armitage et al., 2020; Cebrián-Piqueras et al., 2023; Dawson et al., 2021; Persha et al., 2011; Zhang et al., 2023), the question of how to enable this is subject to lively debate. Past and existing approaches to community-based conservation have been criticised for remaining top-down in practice, drawing on overly simplistic notions of community, and paying insufficient attention to the design of participatory processes (Agrawal & Gibson, 1999; Brosius et al., 2005; Li, 2002; Mulrennan et al., 2012). Learning from these debates, YPI's approach is designed not as a one-off exchange, but as on-going iterative support for the creation and development of CGBs. These governance bodies ideally empower Indigenous Peoples to engage in natural resource management and influence landscape governance on their own terms, while addressing the welfare needs that may otherwise require desperate tradeoffs. **In this way, CGBs aim to enable the effective management of synergies and tradeoffs that ILIs aim to actualize (Armitage et al., 2020; Fariss et al., 2023; Fischer et al., 2023).**

⟶ **A Gema Ratu member in Rambai Sub-village poses with bitter bean seedlings prepared in bamboo bags.**
Photo: Planet Indonesia

1.2 Participatory evaluation of conservation impacts

The evaluation of CGBs presented in this paper applies participatory methods to overcome some of the notorious difficulties of impact evaluation in conservation (Burivalova et al., 2019). **Conservation impacts are hard to measure and disentangle from other factors, as they typically unfold over long periods of time, at multiple scales and within complex realities** (Baylis et al., 2016; Reed et al., 2017). While participatory approaches have been mentioned as cost-effective instruments for evaluating ILIs (Kusters et al., 2018; Reed et al., 2016) and conservation action more broadly (Carmenta et al., 2023; Woodhouse et al., 2015; Zavaleta Cheek et al., 2023), there is a lack of reports that demonstrate how participatory evaluations can be implemented and analyzed at the landscape scale. This paper aims to fill that gap by demonstrating how the results of participatory focus group discussions (FGDs) in multiple locations can be aggregated to evaluate landscape-level outcomes.

The PIA methodology developed here is useful for its ability to generate site-specific indicators, identify synergies and tradeoffs between multiple objectives and dimensions of well-being, measure material as well as non-material (e.g. relational and subjective) indicators of well-being, and attribute outcomes to specific activities. Importantly, PIA can identify locally relevant (and sometimes surprising) theories of change. Simultaneously, PIA serves as vehicles for stakeholder engagement, deliberation, and shared learning. PIA does not preclude the use of other methods, for example to directly measure deforestation, nutrition, or income levels.

Section 2

Context and Methods

In this section:

Photo: Planet Indonesia

2.1 Gunung Nyiut Nature Reserve, West Kalimantan, Indonesia

The Gunung Nyiut Nature Reserve in West Kalimantan, Indonesia is 917 km^2 of montane, sub-montane, lowland rainforest. It was gazetted by the Government in 1985 as a Nature Reserve (Cagar Alam) to protect the watershed of three major rivers, in line with a global push for protected areas. West Kalimantan's Natural Resource Conservation Agency (Balai Konservasi Sumber Daya Alam or BKSDA) has formal management rights over the Reserve. Although YPI's programs center on the Reserve, the broader landscape also includes Protection Forest (Hutan Lindung, a lower level of government protection which primarily aims at safeguarding environmental services such as erosion control and flood prevention), Production Forest (Hutan Produksi Terbatas), and Non-Forest Areas (Areal Penggunaan Lain).

Moreover, official forest categories intersect and overlap in awkward ways with local notions of territory in Borneo (Wadley, 2003). Indigenous Dayak communities have been present in the landscape since before the establishment of the Reserve, following customary landscape management rules and practices which in Indonesian are often referred to as "hukum adat" (Albertus et al., 2023; Peluso & Vandergeest, 2001). Most residents are small-scale subsistence farmers and fishers. The average monthly household income from selling surplus agricultural products, such as pepper, corn, and rubber, is US$70-210 (Novick et al., 2023). The communities have strong economic and cultural ties to the land and forest and place high value on kinship and mutual aid (*gotong royong*), for example when building houses and planting rice paddy.

When the Reserve was established, some settlements found themselves as far as 7 kilometres within its boundaries (Fig. 1). Although its rules and boundaries have remained unclear to most residents, the Reserve has severely restricted their access to basic government services such as infrastructure development, healthcare, and education. Moreover, Reserve regulations strictly prohibit hunting, land clearing, mining, and logging. Nevertheless, in practice the natural resources in the Reserve have been subject to high levels of exploitation, partly because many local community members don't understand or view these regulations as legitimate, and partly because there are few economic alternatives. Because of a lack of local consultation, involvement, or mapping of customary land ownership, many community members feel that their rights have been unjustly taken away by the establishment of the Reserve. Furthermore, restrictions on resource use and access undermined traditional management practices and local stewardship and eroded trust in public authorities and conservation (Bamba, 2000). These fraught relations between local community members and the Reserve have shaped YPI's work in the landscape.

The Gunung Nyiut Landscape

Covering 917 km^2 of montane, sub-montane, and lowland rainforest, Gunung Nyiut Nature Reserve in West Kalimantan was designated a protected area in 1985 to safeguard the watersheds of three major rivers, reflecting global conservation efforts. The Reserve is formally managed by West Kalimantan's Natural Resource Conservation Agency (BKSDA).

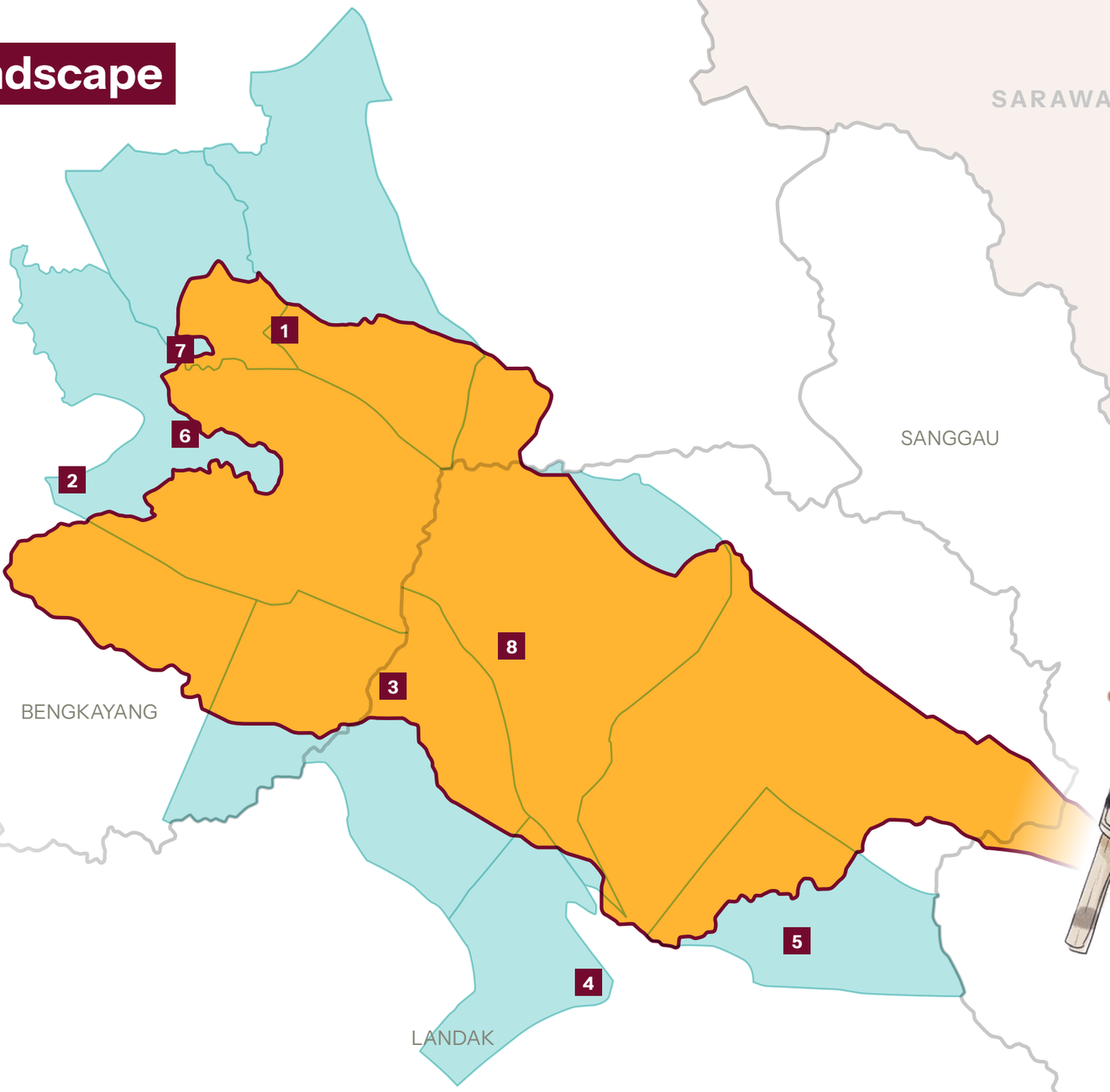
Community & Livelihoods

Indigenous Dayak communities have lived in the Gunung Nyiut landscape since before the Reserve was established, with most residents relying on small-scale subsistence farming and fishing.

US$70-210

is their average monthly household income, from selling agricultural products, such as:

Pepper Corn Rubber



Legend

- Village
- Gunung Nyiut Nature Reserve
- Village Boundaries

Villages

1 Bengkawan
2 Bengkilu
3 Bentiang
4 Dange Aji
5 Engkangin
6 Pisak
7 Sahan
8 Tengon

N

0 2.5 5
kilometers

Figure 1: Map showing the 8 partnership villages and the Gunung Nyiut Nature Reserve (yellow-shaded area) located in the north-western part of West Kalimantan, Indonesia.

Regulations

Although many local residents have limited understanding of its rules and boundaries, the Reserve strictly prohibits:

- Hunting
- Land clearing
- Mining
- Logging

Biodiversity

Gunung Nyiut Nature Reserve hosts diverse tropical flora and wildlife, including the critically endangered **Helmeted Hornbill** (upper-left), the **Abbott's Gray Gibbon** (upper-right), for which Gunung Nyiut supports one of the only known viable populations, and the **Bornean Banded Langur** (lower), with fewer than 300 individuals estimated to remain globally, all highly dependent on the Reserve's intact forests.

2.2 Community-led Governance Bodies

The non-profit organization Yayasan Planet Indonesia (YPI) supports communities living in or near biodiverse ecosystems at risk of degradation. To do so, YPI partners with community-led governance bodies (CGBs) in which community members can discuss, decide on, and participate in landscape management and other activities to address the social, economic, environmental, and institutional challenges they face. CGBs operate on the administrative level of the village, sub-village, or neighbourhood – following the level at which community activity tends to be organized. Since 2017, YPI has helped initiate 12 CGBs in eight villages situated in and around the Reserve (Fig. 1). Like integrated landscape initiatives (ILIs), YPI thus works at the landscape scale, even though individual CGBs operate at a smaller scale.

However, whereas many ILIs are centered around multi-stakeholder partnerships (MSPs) involving local communities as well as corporate and government actors in landscape-level decision making, the CGBs assessed in this paper focus on local communities as the main stakeholders. The departure from MSPs as the main tool for enhancing landscape governance is an adaptation to the context.

1. First, the power of local communities to negotiate with government authorities is limited when they lack access to basic services and tenurial rights.

2. Second, due to the legal restrictions imposed by the Reserve, there are no large corporate stakeholders present in the immediate vicinity of the reserve, and corporations further away do not have an active interest in this landscape.

3. Third, the local communities are heterogeneous groups with multiple conflicting interests, such as environmental protection and economic development.

CGBs are therefore intended as a local decision-making body for managing intra-community synergies and tradeoffs, as well as a representative body that can negotiate with external actors and so enhance landscape-level processes. By involving a wide range of stakeholders (see Table 1), moreover, the approach moves beyond the common focus of ILIs on coordinating

12
CGBs initiated with YPI's help

8
villages supported

between corporate agriculture, communities, and natural resource management authorities. For example, CGBs work together with the Department of Public Health, which provides free medicine at traveling clinics to each village every 3-6 months. CGBs also partner with certified educational degree providers at the district level, who provide monthly tutoring and access to the national exam for local community partners. Finally, the Department of Agriculture has also worked with local CGBs to provide livestock husbandry training as well as other support. In sum, CGBs are community-based organizations that collaborate across sectors with a diverse set of stakeholders at the landscape level.

How YPI Supported CGBs

CGB design was informed by over 250 hours of community consultations, to identify community members' perceptions of challenges they faced across four dimensions of well-being (social, economic, environmental, and institutional) and co-design activities that could alleviate these challenges.

First, YPI suggested additional activities for the communities to consider (such as an incentive program for rifle owners to exchange their guns for cash and farming assets).

These various activities were then adopted or rejected by each community, and incorporated into a Memorandum of Understanding (MoU) between YPI and the village governments. These MoUs defined the rules of engagement, roles and responsibilities, and grounds for termination of the YPI-village partnership.

In addition to technical support and initial funding, YPI also trained CGB members on how to hold annual elections, conduct monthly meetings, and develop work plans to carry out program activities independently.

By joining a CGB, all community members could participate in iterative processes of decision-making, implementation, and evaluation of the ILI.

While there was no conditionality associated with CGB membership, the driving assumption behind this program was that community-led governance, in which community members identify, pursue, and advocate for local priorities, would enable synergies between social, economic, and environmental well-being.

→ **Agricultural training for local communities in the Gunung Nyiut area**. Photo: Planet Indonesia.

2.3 Data collection

This paper analyzes data from Focus Group Discussions (FGDs) conducted by YPI staff in 2022, as part of its ongoing monitoring, evaluation, and learning efforts. The PIA methodology was adapted from the PRISM Conservation Evaluation toolkit (Dickson et al., 2017) and guided by Woodhouse et al.'s (2015) principles for assessing the impacts of conservation interventions on human well-being, such as measuring multiple outcomes and taking into account intra-community heterogeneity. One deviation from these principles was that the evaluation was conducted by YPI staff rather than independent evaluators.

While Woodhouse et al. warn about the risk of getting biased responses from community members, the PIA was a useful opportunity for interaction and learning between community members and YPI staff, especially since staff members who conducted the evaluation were different from those responsible for day-to-day coordination with CGBs. Community members were informed about the aims of the PIA and assured that there would be no negative consequences if they chose not to participate or withdraw consent. No video or voice recordings were taken during the PIAs. Note takers took minutes, but did not identify or record speaker names. They were then given the option to partake in the FGDs.

20
FGDs were conducted in

8
villages

261
total participants, including

148 women **113** men

3
FGD profiles were created

Village leaders only

Female members only

Mixed female & male members

A total of 20 FGDs were conducted in eight villages with a total of 261 participants (148 women and 113 men; Appendix 1). There were three FGD profiles: one with only village leaders (government officials, religious leaders, and customary leaders); one with only female members of the CGB; and one with a mix of male and female CGB members.

The FGDs consisted of two main parts. In the first part, participants were asked to create a list of all the CGB activities they could think of, and to agree how to score them in terms of (1) importance for daily life, (2) importance as motivation to engage with the CGB, and (3) time expended on this activity. These questions were designed by YPI to (1) understand local priorities, (2) help interpret varying levels of participation (Miller et al., 2024), and (3) understand the perceived time burdens of different activities. Scores were given on a scale from 1 (very low) to 4 (very high). The second part of the FGD created an influence matrix. To this end, participants were first asked to group similar activities together into groups of activity. Then they were asked to agree on a list of six most significant changes resulting from the program for the community as a whole, and on the level of influence that each activity had on each most significant change, using a Likert scale (0 to suggest 'No Influence', 1 to show 'Weak Influence', 2 to show 'Moderate Influence', and 3 to show 'Strong Influence').

2.4 Analytical Approach

The current paper further develops the methodology developed for evaluating a CGB in coastal West Kalimantan (Miller et al., 2020) by introducing an additional step of analyzing the combined landscape-level impact of multiple CGBs. Each of the FGDs provided site-specific information that was useful for YPI to improve the quality of the program, but aggregating the results of all the FGDs into an analysis of landscape-level dynamics enables a more robust assessment of the effectiveness of the program.

To that end, we combined all the site-specific CGB *activities* into seven *activity* types. To clarify, there are thus three levels of specificity for the activities: (1) the site-specific individual activities mentioned in part one of the FGDs, (2) the site-specific groups of activities as clustered in part two of the FGDs, and (3) the landscape-level *activity types* as aggregated for the analysis. Similarly, we aggregated the site-specific *most significant changes* from all the FGDs into eleven *outcome categories*. Finally, to analyze the synergies and tradeoffs

between socio-economic and environmental goals, we divided these activity types and outcome categories into socio-economic and environmental domains (see Tables 1 and 2). Even though all activities may be said to have both socio-economic and environmental effects, since the two are interlinked, based on our knowledge of program activities it was possible to identify a domain of *primary* intended outcome for each activity type.

We aggregated the scores assigned to site-specific activities in part one of the FGDs into landscape-level scores for activity types (section 3.1). Then we counted how often a change was mentioned within each outcome category across all FGDs, which we use as an indicator of the importance of each outcome category at the landscape level (section 3.2). Subsequently, we created aggregated influence matrices showing the average level of reported influence of each activity type on each outcome category (section 3.3). The influence matrix (Fig. 3) reveals the strength of the connection between activity types and outcome categories. The scores assigned in different FGDs were averaged to show the link and its strength between an activity type and outcome category.

FGDs in which the link between a specific activity-outcome pair was not discussed were not included in calculating the strength of that link. Sometimes comments on these links were recorded in the FGD reports, and we occasionally draw on these in the discussion to illuminate links of specific interest.

To capture some of the heterogeneity of impacts on well-being within and between communities, we disaggregated these landscape-level results according to FGD profiles (leaders-only, women-only, and mixed), and location of the CGB (within or outside the boundaries of the national park, see Appendix 1). Although participants of each FGD type were asked to identify activities and outcomes of significance for the community as a whole, and not just for themselves individually, we interpreted differences between FGD profiles as reflecting the priorities and perspectives that were particular to those groups. By analyzing which activity types and outcome categories were assigned the most importance, and the ways in which these were linked, we were able to understand landscape-level social impacts across multiple domains of well-being, and how these were perceived by different groups of people and in different places (Gill et al., 2019).

Section 3

Results

In this section:

Photo: Planet Indonesia

3.1 Rankings of project activities

Table 1 lists all the program activities mentioned in the FGDs, and how we grouped these into seven activity types. “Climate-smart agriculture”, “community health support”, and “financial security support” - all activities with primarily socio-economic objectives - scored the highest on significance for daily life. Activities with primarily environmental goals, namely “ecosystem protection and surveillance” and “rifle buyback”, scored much lower. Those activity types that were important for daily life also tended to be an important motivation to join, even though they were considered more time-consuming. There were no major differences between leader-only, mixed, or women-only FGDs (Appendix).

Table 1: List of different activities mentioned in the FGDs and how these were aggregated into activity types for the analysis. The last column displays total significance for everyday life as the sum of the scores awarded across all FGDs for all activities within that activity type.

Activity types	Dimension	Program activities mentioned	Actors involved	Total significance score
Climate smart agriculture	Socio-economic (and environmental)	Farming; the creation of farmer groups; ‘Farmer Mentors’ activities (trained by YPI to support and collect data on farmer groups); tree grafting training; pest control training; demonstration plots (for testing and showcasing new farming methods); stingless-beekeeping; producing organic fertilizer and pesticide; building a shed for storing fertilizer and pesticide; tree planting, agroforestry.	Local farmer groups, Farmer Mentors, CGB working groups on Climate Smart Agriculture, Indonesian Government Department of Agriculture, YPI	208
Financial security support	Socio-economic	Village-led Savings and Loans (VSL) groups; Business groups (who can collectively access small grants from a fund managed by the VSL group); Cash transfers (during COVID-19 lockdowns).	VSL groups; community business groups; YPI	141
Community health support	Socio-economic	Community health services (led by local women trained as “Health Ambassadors” by government health professionals); health data collection (by Health Ambassadors); health counseling and education (by Health Ambassadors), education on non-infectious diseases; free healthcare (by government traveling clinics); COVID-19 vaccinations; nutrition education; cultivating medicinal plants.	(Department of Public Health), YPI	
Ecosystem monitoring and surveillance	Environmental	Biodiversity monitoring (ecological data collection by a team of trained locals; (Hornbill) nest monitoring; SMART patrols (teams of trained locals and government officials that observe and collect data collection on human activity in the by using using the Spatial, Monitoring and Reporting Tool (SMART; Cronin et al. 2021)); awareness raising about wildlife and ecotourism	Community patrols; Community biodiversity monitoring teams; Reserve management authorities (BKSDA); YPI	47
Community organizing and facilitation	Socio-economic	Basic training (in planning, organizing, administration, leadership, and other skills necessary to run a CGB); the establishment of Working Groups (consisting of community members, to run the various activities); routine CGB meetings; CGB leadership evaluation meetings; collaborative working events (gotong royong)	CGB leadership, YPI.	40
Education and literacy	Socio-economic	Basic literacy training and education (support for adults to get school diplomas, in partnership with a local education-focused NGO and the government).	Education and literacy working groups at CGBs; certified education providers at the district level; YPI	37
Rifle exchange	Environmental (and socio-economic)	Rifle exchange (an incentive program for rifle owners to surrender guns in exchange for cash and farming assets)	CGB leadership; District Police; BKSDA; YPI	20

3.2 Most Significant Changes

Of all the changes mentioned across the landscape, the most frequently reported positive changes were socio-economic, including: financial security (26), improved agriculture (23), and improved community health (13) (Table 2, Fig. 2). Positive changes in the environmental domain, related to "reduced deforestation" (8) and "improved wildlife protection" (7) were also mentioned frequently, especially in FGDs that included men (i.e. leaders and mixed). Negative changes classed as "Lack of benefits and enthusiasm" (-10) and "being uncomfortable with patrols" (-3) were only mentioned in FGDs where men were present. The outcome categories "improved agriculture" (23 positive; 3 negative) and "improved forest/land rights" (2 positive, 8 negative) were associated with both positive and negative changes.

Table 2: List of Most Significant Changes (MSCs) mentioned in the FGDs and how these were aggregated into outcome categories for the analysis. Sorted from the outcome category with the highest number of MSCs to the category with lowest number of MSCs.

Outcome category	Most Significant Changes	Dimension
Financial security	Positive: More savings; improved financial literacy and financial management; higher incomes; access to capital.	Socio-economic
Improved agriculture	Positive: Increased agricultural yields; new engagements with agroforestry for sustainable income; better access to agricultural tools; improved knowledge about agriculture; the production of organic pesticides. Negative: Difficulty to sell farm produce; lack of support for farmers	Socio-economic
Improved community health	Positive: Increased understanding about health, better data about community health; improved access to health services	Socio-economic
Lack of benefits and enthusiasm	Negative: The outcomes of some programs are unclear; some activities are not useful; community members are not enthusiastic to participate in activities	Socio-economic
Stronger community governance	Positive: Increased community cohesion and participation in activities, fewer community-level conflicts; better understanding of CGBs	Socio-economic
Reduced deforestation	Positive: Less logging; less land clearing; improved forest management and protection.	Environmental
Improved forest/land rights	Positive: Community received permit to manage village forest; Negative: fear that YPI wants to sell community lands; Lack of information about Reserve governance and boundaries;	Socio-economic
Increased wildlife protection	Positive: Reduced levels of hunting; improved awareness about wildlife.	Environmental

Outcome category	Most Significant Changes	Dimension
Improved education	Positive: Motivation for adults to get a school diploma; easier to continue education; increased education levels	Socio-economic
Uncomfortable with patrols	Negative: Community members feel uncomfortable with the SMART patrols	Socio-economic
Better life skills and knowledge	Positive: Improved life skills and knowledge; gaining new experiences.	Socio-economic

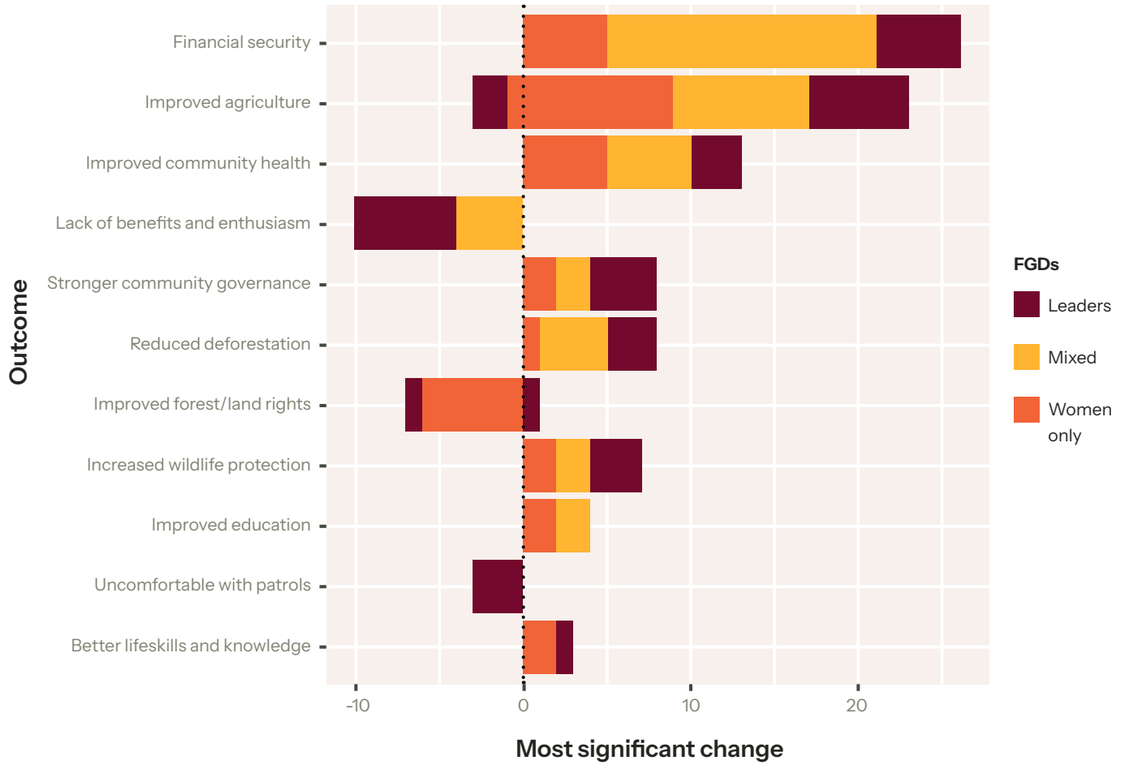


Figure 2: Number of times a Most Significant Change (MSC) was reported in each outcome category across all FGDs, disaggregated by location in relation to the nature reserve (inside or outside), and by FGD profiles (leaders, mixed, women-only). Sorted from highest to lowest number of MSCs

3.3 Identifying links between activities and outcomes

FGDs tended to link activity types to a variety of outcome categories: one activity type often contributed to multiple outcome categories, and one outcome category was often influenced by multiple activity types, as seen in the impact matrix (Fig. 3). For example, the three activity types with the highest total significance for daily life (Table 1), "climate-smart agriculture," "community health support," and "financial security support", each influenced almost all outcome categories. This high level of integration suggests that "significance for daily life" was interpreted very broadly by FGD participants, in relation to multiple different domains of well-being. The three outcome categories in which the highest number of most significant changes were reported, "financial security", "strengthened livelihoods", and "improved community health", were similarly influenced by the full range of program activities.

These links also cut across socio-economic and environmental domains. While environmental outcomes ("reduced deforestation" and "increased wildlife protection") were reportedly influenced by activities with primarily environmental aims ("ecosystem surveillance and monitoring" and "rifle exchange"), there were also strong reported contributions from activity types with primarily socio-economic objectives, such as "climate-smart agriculture", "community health support", and "financial security support". During FGDs, it was explained that better access to capital, credit, and new agricultural techniques had reduced the need to engage in extractive activities in the forest. Similarly, although the three most mentioned outcome categories were all in the socio-economic domain ("improved financial security", "strengthened livelihoods", and "improved community health"), they were achieved not only through socio-economic activities. For example, "Ecosystem surveillance and monitoring" contributed strongly to "improved community health", and the rifle exchange activities contributed modestly to "improved financial security" and "stronger community governance".

⟶ **Community members participating in a business group.** Photo: Planet Indonesia.

Attribution of outcomes could vary considerably between the different FGD profiles, revealing different perceptions concerning pathways of change (Appendix). Mixed FGDs, for example, indicated that all activity types contributed to "reducing deforestation", whereas neither women-only nor leaders-only FGDs saw a link with "education and literacy", "community organizing and facilitation", or "community health support". Changes related to "improved community governance" were also explained differently, with leaders emphasizing "rifle exchange", while mixed FGDs perceived a big role for activities related to "climate smart agriculture" and "financial security support". Finally, activities related to "ecosystem surveillance and monitoring" had stronger effects on different outcome categories according to leaders than according to mixed or women-only FGDs.

FGDs inside and outside the protected area also linked outcomes to activities in different ways (Appendix 3). The FGDs taking place within the reserve linked fewer activities to "reduced deforestation" than FGDs outside the GNNR. However, stronger community governance stood out as an impact that was strongly influenced by most of the program activities inside the protected area. 'Improved education' and 'uncomfortable with patrols' were two outcomes not mentioned by FGDs from inside GNNR vs outside. Some activities, such as "community health", "education and literacy", and "financial security" were linked positively to the negative outcome category of "lack of benefits and enthusiasm". This was a way for participants to indicate that these activities were engaged in with enthusiasm and resulted in benefits, or positively contributed to reducing a 'negative' outcome.

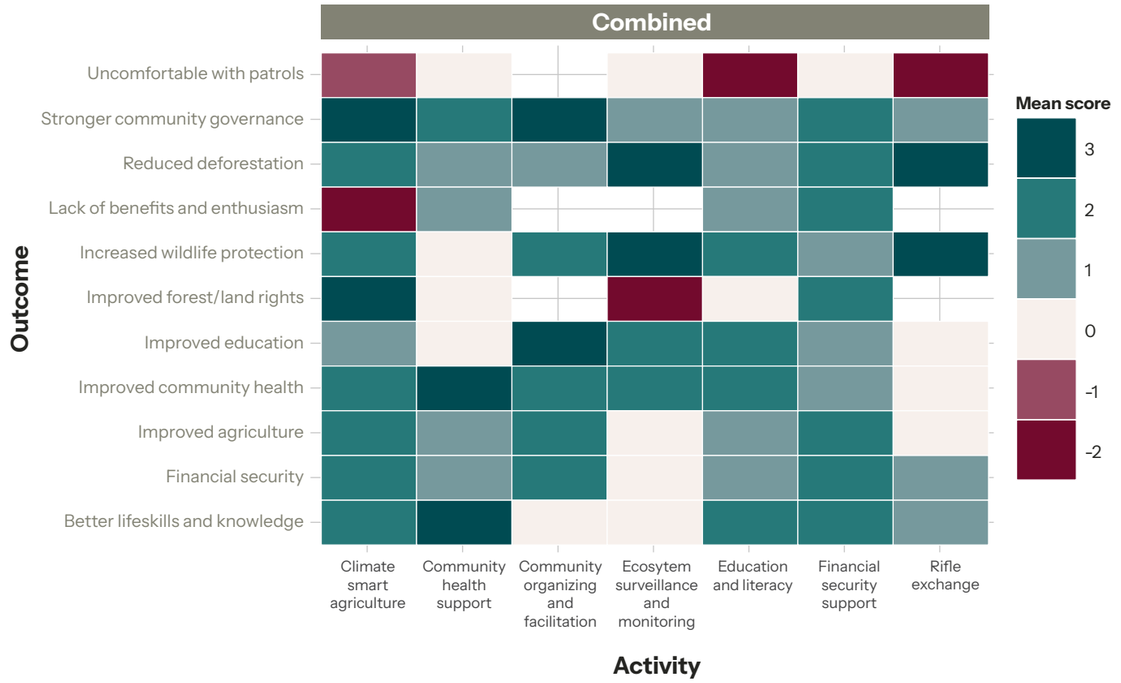


Figure 3: Influence matrix showing the strength of the connections between all activity types (vertical axis) and outcome categories (horizontal axis) as estimated by community members. The colors represent the average scores awarded to each combination in the different FGDs, not considering those FGDs in which the connection was not made.

Section 4

Insights

In this section:

Photo: Planet Indonesia

4.1 Connections between well-being and the environment

The results show that CGBs contributed to various social, economic, and environmental outcomes, as perceived by participating residents. This complements the findings of a previous mixed-methods evaluation of the impacts of this program between 2018-2020, which found that it had contributed to decreased deforestation, decreased natural resource exploitation, improved agricultural practices, and enhanced financial security (Novick et al., 2023). Whereas the earlier study directly evaluated material outcomes, this evaluation centres on community perceptions of a range of project activities and how they are linked to both socio-economic and environmental changes.

Results revealed that community members prioritised actions that directly contributed to socio-economic well-being over activities with primarily environmental aims such as community patrols and rifle exchanges, which are more commonly associated with conservation programs. Relatedly, FGD participants reported more positive impacts on economic and physical well-being than on environmental integrity. These findings resonate with findings from other areas that local communities often "emphasize everyday well-being and equality over the conservation of their surroundings" (Chua et al., 2020; Killick, 2020, p. 1; Thornton et al., 2020).

Nevertheless, even if local communities don't always see conservation as their first priority, the influence matrix revealed the importance of crosscutting influences and synergies between different dimensions of well-being. These findings join several published examples to demonstrate how environmental protection and local well-being are interconnected and can be aligned through cross-sectoral approaches to landscape governance (Aini et al., 2023; Fariss et al., 2023; Kushardanto et al., 2022; Meehan et al., 2023). Building on existing formulations of landscape approaches that integrate agricultural, climate change mitigation, and biodiversity conservation goals (Carmenta et al., 2020), this PIA suggests that it can be productive to go even further and centre other socio-economic priorities of local communities, such as education and health. This can increase local support for conservation (Massingham et al., 2023), may directly contribute to environmental outcomes (Khanyari et al., 2023; Liles et al., 2015), and is instrumental in empowering local communities to take up leading roles in sustainable natural resource management (Dawson et al., 2023).

4.2 Community-led governance can help manage tradeoffs

The findings moreover support the idea that community-led governance plays an important role in managing tradeoffs. Positive links between domains of well-being cannot be taken for granted. In many places, community members regard ecosystem surveillance and monitoring activities with suspicion (Danielsen et al., 2022), as this study also found. Another study showed how efforts at improving support for reproductive rights were connected with reduced compliance over natural resource management measures (Singleton et al., 2019). Rather than assuming positive links between conservation and well-being dimensions, then, an emergent consensus among conservation and ILI scientists and practitioners suggests that governance arrangements are crucially important for creating such synergies (Estrada-Carmona et al., 2014; Milder et al., 2014; Zanzanaini et al., 2017), and that local communities should play a leading role in conservation (Dawson et al., 2021; Steadman, 2021). The results suggest that CGBs were successful not just in combining different activities, but in fostering the type of community-led governance that enables synergies.

The importance of community-led governance was also explicitly identified in FGDs. Activities related to "community organizing and facilitation" were mentioned in almost all FGDs. Even though other activities scored higher in terms of "significance for daily life", FGDs indicated that governance activities contributed not just to "improved community governance", but also to "improved education", "strengthened livelihoods", "increased wildlife protection", "financial security", and "improved community health" (Fig. 3). Similarly, all types of activities contributed positively to the outcome of "stronger community governance". The number and strength of these links indicate local agreement with theories about the importance of enhanced governance as an enabling factor for conservation success.

⟶ **A community health check conducted in the Gunung Nyiut area.** Photo: Planet Indonesia.

4.3 Uneven distribution of benefits

The findings have also highlighted the importance of acknowledging that conservation programs are perceived and experienced differently by different stakeholders and in different contexts. While we identified some negative impacts and critiques, our analysis has focused on the heterogeneous distribution of positive impacts on groups of different social status and gender. To bring this out, we compared differences between leaders-only, women-only, and mixed FGDs. We also discussed differences between FGDs held inside and outside the boundaries of the Reserve.

The different perceptions highlighted in each of the FGD profiles may reflect local heterogeneity of interests. The emphasis placed by leaders on changes related to "improved community governance", and their assessment that activities related to "rifle exchange" had the biggest effect on these changes, reflects the fact that being a good leader is made easier when community members are motivated and able to engage in collective action, and refrain from illegal activity. This is also seen in the fact that leaders saw a wide range of benefits from "ecosystem surveillance and monitoring" activity types. FGDs conducted in another (coastal) part of the province similarly found that leaders attributed a greater variety of positive outcomes to ecosystem patrols (Miller et al., 2020), which confirms that this perception is related to leadership roles. Similarly, the finding that non-leaders make distinct links between activities aimed at socio-economic well-being and reduced deforestation, might have something to do with how they understand their own (past) engagement in extractive activities.

Differences between FGDs held inside or outside the protected area may be explained by the different governance structures faced by the communities there. FGDs within the protected area, for example, saw a wider range of activities as contributing to "stronger community governance". This might be because the governance challenges faced by communities living inside the Nature Reserve were initially greater, as regulations would have made it more difficult for them to feel secure about tenure or gain access to basic government services. Sometimes, differences may be simply due to differences in program activity. That FGDs inside the protected area did not identify improved education as an important outcome, for example, was likely because the education and literacy programs were still less developed in those locations.

These variations are important to acknowledge, first, to gain an accurate picture of the effectiveness of conservation. The perceptions of FGDs with different groups or in different locations may differ on crucial points, so it is important to take a wide range of voices into account in impact evaluation. Second, these differences must also be acknowledged to ensure that conservation efforts are tailored to the diverse needs and priorities of stakeholders, and benefits are distributed equitably.

4.4 Applying PIA to conservation

The results reveal the usefulness of PIA in overcoming some of the key challenges in evaluating ILIs and community-centered conservation approaches (Baylis et al., 2016; Sayer et al., 2013) in ways that align with existing principles for evaluating conservation impacts on well-being (Woodhouse et al., 2015). The PIA captured the multiple and varying outcomes that are characteristic of community-centered conservation and ILIs, by letting local stakeholders identify the most relevant outcomes. The PIA was also able to address problems of attribution, by letting local stakeholders identify links between activities and outcomes. Rather than hypothesising the existence of certain causal relationships, the PIA identified the theories of change as understood by stakeholders themselves. Furthermore, by repeating FGDs with diverse demographics and in multiple different communities, the PIA was able to reveal the heterogeneity of perceptions, and to explore the diversity of outcomes in more depth. Additionally, the analysis in this paper has moved the relevance of PIA beyond the community level, by combining the results of FGDs with multiple communities to assess landscape-level patterns.

Therefore, supporting Kusters et al. (2018), the paper exemplifies how PIA could be taken up more widely as methodological tools for monitoring, evaluation, and learning. Practitioners often struggle to demonstrate to donors the impacts of holistic approaches regarding capacity building and institutional development, since they can be complex and take a long time to materialize. While it remains important to monitor impacts over the long term, our findings also show that PIA can produce preliminary evidence on the outcomes of institutional development within a relatively short time frame, in a cost-effective manner, and while respecting local perspectives.

Besides assessing the effectiveness of conservation approaches, PIA also enables learning and adaptation within programs. Requests for improved and additional support provided YPI with valuable suggestions for improvement. The number of suggestions relating to climate smart agriculture also confirmed to the NGO that agricultural support is a key priority in this landscape. Additionally, YPI learned that lack of land rights were a major barrier and challenge to progress for communities located inside the reserve. The influence matrix (Fig. 3) showed that activities related to “ecosystem monitoring and surveillance” had a strong negative impact on “improved forest/land rights”. One important reason for discomfort with patrols was a fear among community members that the patrols would lead to the exclusion of people from their farmlands by YPI or the management authorities of the Reserve. “Improved forest/land rights” was also linked to “financial security support” and “climate-smart agriculture”, which has to do with local perceptions that providing funding for agricultural activities might be a strategy for external actors like YPI to strengthen future claims to the land on which those activities take place.

These findings highlighted the need for more and clearer communication about the position of YPI and CGBs in relation to the contentious issue of land rights within the Reserve. In addition, YPI has been vamping up efforts to provide tenurial security for communities, exploring possibilities for setting up a Conservation Partnership (*Kemitraan Konservasi*, made possible by recent regulatory changes) between villagers and the BKSDA, and facilitating participatory land use mapping efforts, which were used to advocate for revising where core protection zones, ecosystem restoration zones, and community-use zones should be placed in the Reserve.

Several limitations of PIA should be noted. The PIA did not identify many negative outcomes and tradeoffs, which would be expected to occur in ILIs. While community members may have been mostly positive about the outcomes of the program because, in contrast to MSPs, the CGBs focus primarily on serving community interests, it is also possible that FGD participants were uncomfortable voicing critiques. To elicit more critiques, it may help if FGDs are facilitated by independent evaluators rather than program staff (Woodhouse et al., 2015). Another way of obtaining information about tradeoffs and negative outcomes, is by talking to local community members who have opted out from participating in the ILI. Non-participants were not invited to contribute to the PIA, but YPI has implemented a separate study to learn from their perspectives (Miller et al., 2024). Moreover, although we were able to aggregate results from multiple communities into landscape-level scores and impact matrices, it was not possible to account for how long CGBs had existed, such that results from long-standing and relatively newer CGBs were weighted equally in ways that may have obscured differences between them. Finally, while PIA provides crucial information about local perspectives on outcomes and causal linkages, these could be triangulated with additional research on impacts and pathways of change.

→ **A pair of Silvery Lutungs with their bright orange baby**. Photo: Planet Indonesia.

Conclusion

In this paper, we have tried to show how PIAs can be useful not just to inform adaptation and learning at the community-level, but also to evaluate the impacts of community-centered conservation approaches at the landscape scale.

The insights shared highlight the importance of capacity building, institutional development, and cross-sectoral synergies across multiple domains of well-being, providing empirical support for the effectiveness of ILIs and community-centered approaches for addressing socio-ecological challenges. The results also confirm that the perceived impacts of contextualized and holistic conservation interventions necessarily vary between communities, across different dimensions of well-being, and between different segments of local communities. PIAs are well-suited to document heterogeneous perceptions such as these, and could be triangulated with additional sources of data - such as from household surveys, satellite imagery, or bioacoustics - for enhanced robustness.

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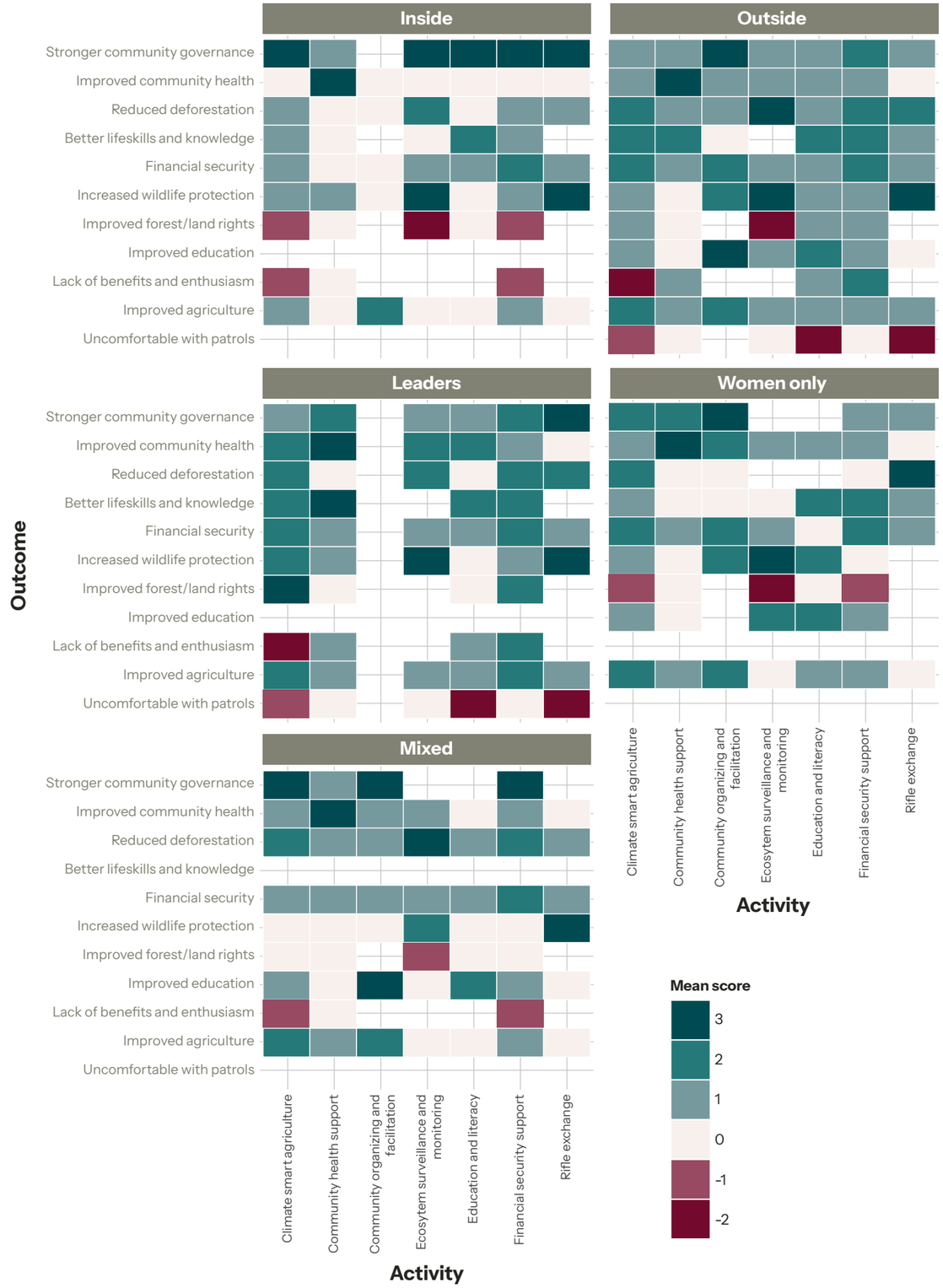
Appendix

Appendix 1: Overview of Focus Group Discussions (FGDs) held as part of the Participatory Impact Assessment, with the name of the site where the Conservation Cooperative was based, and the number of FGD participants.

Village Name	Community Location	Inside/outside reserve	Leaders		Mixed		Women only
			Women	Men	Women	Men	Women
Bengkawan	Umbo	Inside	0	5	10	9	0
Bengkilu	Laek	Outside	0	10	9	8	12
Bentiang Madomong	Sejanjung	Inside	0	0	9	6	12
Dange Aji	Dange Aji	Outside	0	8	6	1	0
Engkangin	RT 04	Outside	1	13	8	4	12
	Tauk	Inside			5	6	10
Pisak	Dawar	Outside	1	8	9	4	13
Sahan	Mensibu	Outside	0	5	4	10	0
Tengon	Kulum	Inside	0	0	10	16	17
Total			**2**	**49**	**70**	**64**	**76**

Appendix 2: Community perceptions of programmatic activities as important for daily life, motivators to join, and the time required split between FGD type.



Appendix 3: Impact matrix (see Figure 3 in main text) disaggregated by type of focus group (leaders-only, women-only, mixed) and by location of FGD (within reserve boundaries or outside of reserve boundaries)

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