

ECO-SOCIAL CONTRACTING FOR ENVIRONMENTAL JUSTICE

Assessing the Effectiveness of Community-
Based Natural Resource Management

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Abstract

This working paper explores the role of community-based natural resource management (CBNRM) in contributing to environmental justice as envisaged by the concept of a new eco-social contract. CBNRM actively involves local communities in sustainable resource management, aligning with the principles of new eco-social contracts. The study analyses key factors influencing CBNRM project outcomes, including influential elites, institutional frameworks, policy dynamics and financing mechanisms. Environmental justice is emphasized as a central concept, highlighting the significance of eco-social contracting in fostering fair and sustainable resource management. Using qualitative and quantitative techniques, case studies from Africa and Asia, and documentary analysis, this paper illustrates how community-based approaches support environmental justice objectives. The paper advocates for inclusive and equitable eco-social contracts to empower local communities in resource management and conservation efforts, addressing challenges related to governance structures, capacity building and financial aspects. The implications of this research are essential for sustainable resource management and inclusive development, aligning with the United Nations 2030 Agenda for Sustainable Development. By examining the transformative potential of CBNRM, this study provides valuable insights for policy makers, practitioners and researchers. Embracing inclusive and equitable approaches, strengthening governance structures and fostering collaborative partnerships is deemed crucial for promoting environmental justice and empowering communities in their journey toward sustainable and just resource management.

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Acronyms

CBNRM	Community-based natural resource management
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
FGD	Focus group discussion
GMA	Game Management Area
LIRD	Luangwa Integrated Resource Development Project
NGOs	Non-governmental organizations
RECOFTC	Regional Community Forestry Training Center for Asia and the Pacific
SLAMU	South Luangwa Area Management Unit
UNRISD	United Nations Research Institute for Social Development
VAGs	Village Action Groups
VIDCO	Village Development Committee
WADCO	Ward Development Committee
ZIRD	Zimbabwe Institute for Research and Development

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1. Introduction

In an era marked by growing concerns over environmental degradation and the imperative of sustainable development, particularly pronounced in developing nations, where reliance on natural resources for livelihoods and economic growth often leads to environmental and socio-economic issues, the concept of community-based natural resource management (CBNRM) has emerged as a promising solution.¹ Stemming from the need to address overexploitation, loss of biodiversity and social inequalities, CBNRM endeavors to empower local communities in resource conservation and equitable access to natural resources (Berkes 2009; Dasgupta 2021).

This research evaluates the efficacy of CBNRM in realizing environmental justice in developing countries, thereby contributing to new eco-social contracts (UNRISD 2021). According to UNRISD, new eco-social contracts need to be built on universal human rights, progressive fiscal arrangements, sustainable economies, harmony with nature, gender justice and collective solidarity (UNRISD 2021).

The paper examines the impact of community-based approaches on environmental restoration, livelihoods, resource distribution and social disparities. By intertwining the tenets of the eco-social contract with CBNRM, the study underscores their potential to address environmental challenges and engender fairness (Agrawal and Gibson 1999; UNRISD 2021). The study aims to advance sustainable development, environmental governance and community empowerment by furnishing insights into the outcomes of community-based initiatives. The paper presents the research methodology, the conceptual framing, a comprehensive data analysis and policy recommendations aligned with the transformative vision of the eco-social contract. This working paper is meant to present a tangible route toward the realization of the 2030 Agenda for Sustainable Development—a collective effort to instill environmental justice and sustainable resource management within developing nations.²

2. Research Methodology

To comprehensively assess the effectiveness of CBNRM in advancing environmental justice within developing countries, a mixed-methods research approach was employed. This design integrated diverse data collection methods ensuring a robust and comprehensive exploration while validating findings for enhanced research credibility through triangulation.

The research focused on two primary case study regions: Zambia's Luangwa Valley and Pred Nai Village in Thailand. These regions were selected based on their diverse ecological contexts and varying degrees of CBNRM implementation, providing a comprehensive understanding of CBNRM's impacts. Specifically, the first study examined the Lupande Game Management Area (GMA), part of the Luangwa Integrated Resource Development Project (LIRDP). This area is

¹ Adams et al. 2004; Biermann et al. 2009; Lele et al. 2010.

² Charnley and Poe 2007; Berkes et al. 2003; Ostrom 2005; UN 2015.

notable for its transition from a centralized to a community-driven CBNRM model. The second case study involved the Pred Nai Community Forestry Group's efforts in mangrove management, supported by the Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC).

A combination of qualitative and quantitative data collection methods was used to gather comprehensive insights. Thirty-six in-depth interviews were conducted with key stakeholders, including community members, traditional and local leaders, government officials and non-governmental organization (NGO) representatives. The interviews were semi-structured, allowing for open-ended responses and detailed insights. Interviews were conducted in the local languages, transcribed verbatim, and analyzed using NVivo software to identify patterns and themes. Five focus group discussions (FGDs) were held, involving 20-35 participants each, in rural communities within the Hwange and Lupane districts of Zimbabwe. These discussions facilitated dynamic exchanges and captured diverse community perspectives on CBNRM and environmental justice. Structured surveys were administered to a representative sample of 232 respondents from accessible communities in Zimbabwe and Zambia. The surveys included questions on demographics, perceptions of CBNRM, community participation, benefits distribution, challenges and environmental justice outcomes. The survey data was cleaned and analyzed using descriptive statistics, cross-tabulation, inferential statistics and regression analysis to uncover relationships and correlations.

Also, a systematic review of academic literature, policy documents, and legal frameworks was conducted to contextualize the findings. This review focused on CBNRM and environmental justice policies, governance structures and their integration within the eco-social contract framework.

Thematic analysis was employed to identify recurring patterns and themes from interview and FGD transcripts. This six-step method (Braun and Clarke 2006) provided nuanced insights into CBNRM's implications for environmental justice. Statistical analyses, including chi-square tests, t-tests, regression analysis and correlation analysis, were conducted on the survey data to explore relationships between variables such as community participation and perceived benefits of CBNRM.

The research adhered to ethical guidelines, ensuring informed consent from all participants and maintaining confidentiality. Ethical approval was obtained from relevant local authorities and all participants in the form of signed consent forms.

3. Conceptual Framework

The conceptual framework revolves around the nexus between environmental justice, eco-social contracting and community-based natural resource management within the context of advancing equitable and sustainable resource governance in developing nations.

At its core, environmental justice is a pivotal concept centred on the distribution of environmental benefits and burdens, with a particular focus on empowering marginalized communities that often

disproportionately bear the brunt of ecological deterioration (Adams et al. 2004). Aligned with this, the eco-social contract, as conceived by the United Nations Research Institute for Social Development (UNRISD), presents a framework that seeks to reinforce relationships between society, nature and governments (UNRISD 2021, 2022). This progressive contract theory underscores inclusivity, participatory practices, and a new contract for nature to realize both social and environmental justice. The concept of eco-social contracting provides a framework for a progressive, inclusive and sustainable pact between stakeholders and the environment, addressing both substantive and procedural aspects of justice (Kempf et al. 2022; UNRISD 2022). It is underpinned by its fundamental philosophy that entails negotiated agreements and collaborative partnerships between a spectrum of stakeholders, including local communities, governmental bodies, NGOs and private entities to collectively manage and govern natural resources. These collaborations culminate in the collective stewardship and governance of natural resources, all the while echoing the tenets of the new eco-social contract by virtue of fostering transparency, accountability and empowerment.

CBNRM assumes the role of a driving force within this framework, converging environmental justice principles, the eco-social contract and the pragmatic application of community-based natural resource management to champion equitable and sustainable resource governance (Berkes et al. 2003). Through CBNRM, local communities are poised to become both custodians and decision makers. This transformative approach resonates with the principles of the eco-social contract, characterized by its emphasis on community participation, decentralized decision making, and the recognition of Indigenous knowledge (UNRISD 2021).

The concept of eco-social contracting is pivotal in bridging the principles of environmental justice and community-based natural resource management (CBNRM). It offers an inclusive and participatory approach to achieving equitable resource governance by advocating for collaboration, transparency and empowerment. This contractual framework aligns seamlessly with CBNRM's principles of community participation and adaptive management, thus empowering marginalized communities in decision-making processes and ensuring a fair distribution of benefits. By addressing historical disparities, eco-social contracting fosters a more equitable and just society.

Eco-social contracting aims to cultivate inclusive and transparent governance mechanisms, which are crucial for promoting environmental justice. It ensures that the costs of transitioning to a low-carbon economy and achieving sustainability are shared fairly, while guaranteeing access to natural resources and a healthy environment for all. This approach stimulates participation, empowerment and accountability, resonating with the United Nations Research Institute for Social Development's (UNRISD) vision of integrated environmental, social and economic well-being. Through negotiated frameworks, communities can establish procedural and substantive justice, ensuring their active role in resource management decisions.

Integrating eco-social contracting principles into CBNRM initiatives significantly augments the potential for achieving environmental justice. This comprehensive framework, derived from diverse theoretical perspectives, underscores CBNRM's transformative capacity to bridge the gap between marginalized communities and equitable resource governance. It aligns with the broader goals of

sustainable development as envisioned within the new eco-social contract paradigm. By fostering transparency, collaboration and inclusivity, eco-social contracting enhances the efficacy of CBNRM initiatives, contributing to the aspirations of a sustainable and just global system.

4. Community-Based Natural Resource Management (CBNRM): A Comprehensive Overview and Case Study Analysis

4.1 Evolution of community-based natural resource management: From Indigenous practices to participatory conservation

Community-based natural resource management has emerged as a transformative approach in developing countries, shifting from centralized governance to community-driven conservation efforts, often funded by a hybrid model combining donor and government support. Grounded in decentralization, participation and local knowledge, the content of CBNRM draws on different historical epochs, from Indigenous practices to the contemporary model. Pre-colonial times showcased Indigenous communities' innate ecological understanding, as their resource management practices harmonized with nature to ensure communal well-being (Berkes 2012; Berkes et al. 2000). In Africa, *Amazilo/Inzilo*³ concepts were used to protect ecosystems and endangered flora and fauna species and customary laws and communal land tenure facilitated collective decision making (Mamdani 1996), while Asia's *Subak*⁴ system and terraced farming underscored efficient water management (Li 2014). These practices laid the foundation for CBNRM, emphasizing community involvement.

Colonial rule disrupted these practices, imposing exploitative and centralized resource management for colonial gains. Post-colonial times saw inherited top-down management models persist, causing unsustainable resource management and social disruption (Blaikie and Brookfield 1987; Fabricius et al. 2004). A realization emerged that inclusive, participatory approaches were imperative. The latter half of the twentieth century marked a paradigm shift toward community participation and decentralization as core CBNRM principles (Cleaver 1999). Acknowledging local communities as essential stewards, this shift aimed to bridge traditional wisdom and modern science, empowering communities to drive sustainable resource management (Agrawal and Gibson 1999; Berkes 2010). CBNRM emerged as the conduit to intertwine resource conservation with societal well-being.

4.2 The fundamentals of CBNRM

Community-based natural resource management is a comprehensive and empowering approach to sustainable resource management in developing countries, guided by foundational principles that have evolved over time. CBNRM seeks to forge an interdependent relationship between local

³ *Amazilo/Inzilo* are traditional African concepts referring to community practices aimed at conserving ecosystems and protecting endangered flora and fauna. These Indigenous resource management practices emphasize collective decision making, sustainable use of natural resources and the preservation of biodiversity through cultural and spiritual beliefs.

⁴ *Subak* is a traditional irrigation system in Indonesia that dates back to the ninth century. It is a cooperative water management system used by Balinese rice farmers to distribute water efficiently across rice terraces. The *Subak* system is deeply rooted in Balinese culture and Hinduism, emphasizing communal effort, equitable water distribution and sustainable agricultural practices. It exemplifies the integration of social, religious and ecological aspects in managing natural resources.

communities and their environment while achieving environmental conservation, social equity and sustainable development in developing countries. Central to CBNRM is the principle of community participation, where local communities actively engage in decision making and resource management, fostering ownership and commitment (Berkes 2004). This involvement begins from project inception and extends through planning, implementation and evaluation, ensuring holistic community engagement.

CBNRM's framework recognizes local knowledge and practices, acknowledging the resilience and adaptability embedded in Indigenous wisdom. The integration of traditional ecological knowledge alongside contemporary scientific insights fortifies resource management strategies, enhancing ecosystem resilience and resource sustainability (Berkes 2012). By bridging traditional ecological knowledge with modern scientific knowledge, CBNRM enables dynamic and resilient resource stewardship. Decentralized governance and decision making are also fundamental to CBNRM, empowering local institutions and shifting authority from central bodies to communities. This autonomy leads to resource management tailored to local socio-cultural and ecological contexts, bolstering accountability and responsiveness (Carlsson and Berkes 2005).

Another hallmark of CBNRM is equitable benefit-sharing, ensuring that all community members, including marginalized groups, partake in the advantages of resource management. This equitable distribution not only promotes social justice and poverty reduction but also engenders communal cooperation and minimizes conflicts (Mahanty et al. 2006). The collaborative spirit is also pivotal in successful CBNRM, forging partnerships between diverse stakeholders like governmental bodies, NGOs, researchers and private sectors. These alliances cultivate co-management approaches that bridge local communities with external actors, encouraging knowledge exchange and sharing, thereby enhancing natural resource management (Fabricius et al. 2004).

Adaptive management, rooted in trial-and-error and learning-by-doing, acknowledges the dynamic nature of ecosystems. CBNRM embraces flexibility, continuous monitoring and evaluation to respond effectively to changing environmental conditions, fostering resource management improvement (Armitage et al. 2009). CBNRM fundamentally redefines resource management by centring it around community well-being, environmental health and sustainable development. Through these bedrock principles, CBNRM charts a path toward environmental justice, community resilience and a transformative eco-social contract that empowers local communities as sustainable resource stewards.

4.3 Governance and CBNRM

Effective governance is a cornerstone of CBNRM, influencing decision making, resource allocation and project outcomes. Strong governance practices ensure transparency, accountability and equitable benefit sharing among stakeholders, encompassing formal institutions and informal norms (Ostrom 1990).

Governance models in CBNRM are diverse, adapted to specific social, cultural and ecological contexts. Co-management partnerships between communities and government entities, or

community-led governance, empower local decision making (Agrawal and Gibson 1999). Inclusivity is central, as involving communities fosters ownership and aligns strategies with local needs (Berkes 2004). Participatory decision making is a hallmark of effective CBNRM governance, tapping into local knowledge and practices. It goes beyond consultation, enabling communities to actively contribute to resource management plans (Berkes 2004). Empowering local stakeholders through capacity building enhances their engagement in decision making. Devolution of authority, a vital governance aspect, empowers local communities to manage their resources (Berkes 2009). Clear policies and legal frameworks safeguarding community rights are crucial for successful devolution (Berkes 2009). Transparency and accountability are foundational principles, ensuring access to information and responsible decision making (Borrini-Feyerabend et al. 2004). Monitoring and evaluation mechanisms assess governance effectiveness, enhancing cooperation and CBNRM success. CBNRM's governance intricacies shape its outcomes, promoting sustainable resource management and benefit sharing among stakeholders (Ostrom 1990).

4.4 Best practices and challenges in CBNRM implementation

4.4.1 Best practices

Several best practices have emerged in the implementation of CBNRM initiatives that contribute to achieving environmental justice. Firstly, establishing strong governance structures that promote inclusivity and transparency is crucial. This involves recognizing and assigning clear rights and responsibilities, acknowledging local institutions and facilitating meaningful participation of marginalized groups in decision-making processes (Ostrom 1990). Effective governance structures should aim to balance power dynamics and provide opportunities for marginalized communities to influence resource management outcomes. Secondly, capacity building and community empowerment are vital elements for the success of CBNRM initiatives. Empowering local communities through education, training and skills development enables them to actively engage in resource management activities and assert their rights (Measham et al. 2011). Additionally, promoting gender equality and social inclusion within CBNRM processes enhances the overall effectiveness and sustainability of initiatives. Lastly, fostering collaboration and establishing partnerships emerges as a crucial element. The successful implementation of CBNRM relies on the collaborative efforts among various stakeholders, including communities, government agencies, NGOs and researchers. By forging strong partnerships and nurturing trust among these diverse actors, the exchange of knowledge is facilitated, collective decision making is enhanced, and the overall effectiveness of CBNRM initiatives is improved.

4.4.2 Challenges

CBNRM initiatives are also confronted with multiple challenges.

Power dynamics and inequitable decision making: Power imbalances within communities and between communities and external actors can hinder meaningful community participation in CBNRM. Unequal decision-making processes may lead to the exclusion of marginalized groups, limiting their ability to influence resource management. Addressing power dynamics is crucial to ensure inclusive governance and equitable distribution of benefits (Lebel et al. 2010).

Financing and resource mobilization: Financing CBNRM initiatives poses a significant challenge, particularly in resource-constrained settings. Adequate financial resources are needed to support community-led conservation efforts, implement sustainable livelihood projects, provide infrastructure for resource management, and build the capacity of local institutions. However, securing sustainable and long-term funding for CBNRM initiatives remains an ongoing challenge. Existing funding mechanisms often lack stability and are subject to fluctuations, making it difficult to ensure the continuity of CBNRM programmes. Additionally, communities may face difficulties in accessing financial resources due to limited financial literacy, bureaucratic processes and a lack of information about available funding opportunities. Innovative financing mechanisms and partnerships between the public, private and civil society sectors are necessary to overcome these challenges and ensure the financial sustainability of CBNRM initiatives.

External pressures and conflicting interests: CBNRM initiatives often face external pressures and shocks, such as large-scale development projects, commercial interests and climate change impacts. These external pressures and shocks can disrupt traditional resource use patterns, exacerbate conflicts and undermine community efforts in conservation. Balancing competing interests and addressing external challenges requires careful planning and negotiation (Fabricius et al. 2004; Dressler et al. 2010).

Governance and policy ambiguities: Ambiguities in governance structures and policies can pose challenges to effective CBNRM implementation. Unclear legal frameworks, overlapping jurisdictions and conflicting policies at different levels of governance can create confusion and hinder decision making. Streamlining governance structures and aligning policies are essential for enabling successful CBNRM (Carlsson and Berke 2005; Meinzen-Dick et al. 2004).

5 Community Empowerment through CBNRM: Cases from Zambia and Thailand

This section examines the empowerment of communities through community-based natural resource management (CBNRM) by presenting two illustrative case studies: Zambia's Luangwa Valley and Pred Nai Village in Thailand. These cases were selected for their exemplary implementation of CBNRM principles and their distinct socio-ecological contexts. Zambia's Luangwa Valley provides a significant example of a transition from centralized to decentralized CBNRM, demonstrating extensive community involvement and wildlife conservation. Pred Nai Village, renowned for its successful mangrove management and community-led biodiversity restoration, showcases the effective participation of marginalized groups in sustainable resource utilization. These case studies offer valuable insights into the diverse applications and transformative potential of CBNRM, providing comparative lessons that can inform broader environmental justice and sustainable development efforts.

5.1 CBNRM in Zambia's Luangwa Valley

This case study examines the evolution of the CBNRM programme in Zambia's Luangwa Valley, particularly focusing on the Lupande Game Management Area (GMA).⁵ The programme was initially developed as part of the LIRD with the primary objective of controlling poaching through community involvement and poverty alleviation. However, over the years, the Lupande programme underwent significant changes and took on a more robust rural development role (Ribot 2003).

The Lupande programme in Zambia's Luangwa Valley exemplifies the transformative power of CBNRM initiatives in achieving positive outcomes for both environmental conservation and social development. However, the programme underwent a significant evolution during its second phase, embracing decentralization, community empowerment and direct control over wildlife revenues to achieve greater success.

The Lupande programme's first-generation CBNRM model centralized authority and benefits at the district level, resulting in limited community involvement and benefits. This top-down approach failed to establish a strong connection between wildlife conservation and individual benefits, leading to suspicion of corruption and exploitation of resources by government officials, and discontent within the community. In contrast, the shift to a second-generation CBNRM model proved highly effective. This new approach empowered organized villages by granting them full control over 80 percent of wildlife revenues. Villages were empowered to democratically decide how to use the revenue, fostering community organization and capacity building. Regular meetings, elections and financial transparency promoted community engagement in decision making, leading to democratization and empowerment. This transformation resulted in tangible development outcomes, including the completion of over 150 projects such as schools, clinics, wells and housing for teachers. Wildlife conservation efforts were bolstered as poaching decreased, and community scouts were actively involved in management. Attitudes toward wildlife shifted positively as it was increasingly recognized as a valuable community asset (LIRD 1996; Wainwright and Wehrmeyer 1998).

The success of the Lupande programme demonstrates how CBNRM initiatives can align with the principles of the new eco-social contract, emphasizing both environmental and social justice. Through downward accountability, communities gained control over wildlife resources, promoting social equity and ensuring direct benefits from conservation endeavors. Transparent governance and financial accountability further enhanced environmental justice. Lessons from the Lupande programme offer valuable insights for future CBNRM projects, facilitating sustainable resource governance, fostering social development and advancing environmental justice principles.

5.2 Empowering marginalized communities through participatory CBNRM: A case study of Pred Nai Village, Thailand

The case study of participatory community-based natural resource management (CBNRM) in Pred Nai Village, Thailand, showcases a successful model of empowering marginalized groups to manage

⁵ See appendix 2 for further details on this project.

their mangrove resources and improve livelihoods.⁶ In collaboration with the Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC), the project garnered support from governmental offices, educational institutes and funding agencies. The project's objective was to restore and conserve the mangrove forest, prevent external exploitation and ensure sustainable community development (RECOFTC 2000, 2001).

Utilizing a participatory approach, the Pred Nai Community Forestry Group engaged a diverse range of community actors, including government agents, religious leaders, teachers, and members of various socioeconomic statuses, such as farmers, fishers and local business owners. This broad engagement ensured that different community perspectives and knowledge were incorporated into the management strategies, fostering a sense of ownership and responsibility among the participants. Funding from sources such as the Social Investment Fund⁷ and the Thailand Research Fund underscored the importance of external support for successful community-based natural resource management. The outcomes were noteworthy, with a doubling in the number of crab harvesters resulting in increased income for the community. This economic benefit was complemented by the return of various fauna and marine products, enhancing overall biodiversity. Specifically, the sustainable management practices led to the resurgence of Samae monkeys, wetland birds and bees, which are indicators of a healthy mangrove ecosystem. This biodiversity enhancement reflects the project's success in balancing resource utilization with ecological preservation, demonstrating that sustainable harvesting can coexist with environmental conservation.

Sustainability and replication were achieved through collaboration with governmental and non-governmental organizations, making the project, which continues to operate, a model for other communities. Balancing resource utilization with environmental conservation was vital for maintaining ecosystem health and supporting livelihoods. For enhanced participation of marginalized groups, action research and continuous monitoring were recommended. Networking with other villages allowed for knowledge exchange and broader impacts on natural resource management (RECOFTC 2006).

The success of the Pred Nai Community Forestry Group offers lessons for future CBNRM initiatives. A participatory approach, involving all stakeholders including marginalized communities, is essential for effective empowerment and biodiversity enhancement. Further, strengthening community institutions, securing external support and fostering knowledge exchange are vital for successful CBNRM initiatives. Finally, encouraging knowledge exchange among communities engaged in CBNRM promotes shared learning and best practices.

⁶ See appendix 3 for further details on this project.

⁷ The Social Investment Fund is a financial mechanism designed to support community-based projects, particularly in rural and marginalized areas. It aims to improve living standards, promote sustainable development, and enhance community resilience by providing grants and low-interest loans for various development initiatives. It was established in the early 1990s by the Government of Thailand, with support from international development partners such as the World Bank and the United Nations Development Programme (UNDP).

6. Findings on CBNRM and Environmental Justice: Evidence from Zambia and Zimbabwe

This section presents the results and discussion derived from a comprehensive and in-depth investigation into the effectiveness of community-based natural resource management in promoting environmental justice in developing countries. The study incorporates data from structured surveys, in-depth interviews and focus group discussions to offer a multifaceted exploration of the complex relationships between CBNRM initiatives and environmental justice outcomes. The structured survey gathered quantitative data on various dimensions of CBNRM and environmental justice, assessing community perceptions, participation levels, benefits distribution, challenges and opportunities (see appendix 1). In-depth interviews with key stakeholders provided nuanced insights into power dynamics, decision-making processes and environmental justice impacts. Additionally, FGDs fostered peer-to-peer interactions, revealing gender dynamics and aspirations for CBNRM's future. The results highlight CBNRM's potential to promote environmental justice while identifying challenges and opportunities influencing outcomes.

6.1 Survey findings

Survey results indicated that a majority of respondents in Zimbabwe and Zambia held positive perceptions of CBNRM initiatives. Respondents acknowledged CBNRM's positive impact on local environments, particularly improvements in the abundance and accessibility of natural resources such as water, forests and wildlife. This recognition reflects CBNRM's potential to contribute to ecological sustainability and conservation efforts by ensuring that these resources are not only preserved but also more readily available to the communities that depend on them. Despite the positivity, the survey also revealed challenges, notably limited community involvement in decision-making processes about resource management. This highlights the importance of enhancing inclusivity and participation for equitable CBNRM outcomes.

In terms of benefit distribution, the survey unveiled both positive outcomes and concerns about fairness. While some respondents noted improved livelihoods and better access to amenities, a significant portion expressed worries about unequal benefit sharing. This underscores the need for careful programme design to prioritize all community members, especially marginalized groups. The challenges of financial resources and technical expertise were evident, signaling the necessity of external support and capacity building for sustainable CBNRM. Gender inclusivity and women's empowerment emerged as a success of CBNRM. Respondents acknowledged significant positive shifts in women's involvement in natural resource management due to CBNRM initiatives. Before the shift, the gender division of labor in natural resource management was highly skewed, with men predominantly controlling decision-making processes and access to resources, while women were relegated to peripheral roles, often limited to domestic and subsistence activities. The shift facilitated a more equitable distribution of roles, enabling women to take on leadership positions within community development structures, such as Village Development Committees (VIDCOs) and Ward Development Committees (WADCOs). This change was generally well-received by the community as it was not imposed from above but rather emerged from within, supported by both community leaders and external facilitators who promoted gender equity as a fundamental principle of

sustainable development. Women's increased participation led to more holistic and inclusive decision-making processes, which were perceived as enhancing the overall effectiveness of natural resource management. The community's acceptance and promotion of greater involvement of women signify a cultural shift toward more inclusive governance, fostering social equity alongside environmental sustainability. This empowerment potential is a significant stride toward social equity. While CBNRM was seen to reduce resource conflicts, respondents stressed the importance of maintaining ecological resilience and sustainable resource use for future generations. This underscores the long-term focus of CBNRM for intergenerational fairness. Collaborative partnerships among stakeholders were seen as essential for CBNRM's success. NGOs and supportive government programmes and policies such as the Hwange Sanyati Biological Corridor Project⁸ and the amended Mines and Minerals Act⁹ were recognized for fostering cooperation and effective implementation. This highlights the importance of partnerships for achieving shared environmental justice goals.

⁸ The Hwange Sanyati Biological Corridor (HSBC) Project is an initiative aimed at enhancing biodiversity conservation and improving the livelihoods of communities living in and around the Hwange National Park and Sanyati River Basin in Zimbabwe. The project focuses on promoting sustainable land use practices, mitigating human-wildlife conflicts, and fostering community-based natural resource management to ensure the long-term preservation of the corridor's ecological integrity.

⁹ The amended Mines and Minerals Act refers to the revised legislation in Zimbabwe that governs the mining sector. The amendments aim to improve regulatory oversight, ensure more equitable distribution of mining benefits and promote sustainable mining practices. Key provisions include stronger environmental protection measures, increased transparency in mining operations and enhanced community participation in decision-making processes related to mineral resource management.

Box 1. Survey Data Analysis: An Overview

Descriptive statistics: The survey collected data from 232 respondents, including 137 from Zimbabwe and 95 from Zambia. The mean age of the respondents was 34 years, with a standard deviation of 8.5, indicating a relatively young and homogeneous age distribution within the sample. The gender distribution was relatively balanced, with 55 percent of respondents being male and 45 percent being female. In terms of education level, 30 percent of the respondents had completed tertiary education, 45 percent had completed secondary education as their highest level of education, and 25 percent had completed primary education as their highest level of education, indicating a diverse educational background among the participants. The mean household size was 5.2 members, with a standard deviation of 1.7, indicating variations in household sizes among the respondents.

Frequency distributions: Frequency distributions were used to understand the prevalence of various responses to the survey questions. For example, when asked about their perception of CBNRM, 25.0 percent of the respondents rated it as very positive, 44.8 percent as positive, 22.8 percent as neutral, 6.0 percent as negative and 1.3 percent as very negative. This suggests that a majority of the respondents had positive perceptions of CBNRM.

Cross-tabulation: Cross-tabulation was employed to explore relationships between different variables. For instance, cross-tabulating respondents' perceptions of CBNRM with their location (Zimbabwe or Zambia) revealed that 71.6 percent of Zimbabwean respondents had positive perceptions compared to 67.4 percent of Zambian respondents. This indicates that respondents from both countries generally share similar perceptions of CBNRM.

Chi-square test and t-tests: Chi-square tests and t-tests were used for inferential statistics to draw population-based conclusions from the sample data. For example, a chi-square test was conducted to examine if there was a significant association between respondents' perceptions of CBNRM and their level of education. The results showed that there was a significant association ($p < 0.05$), indicating that education level influenced respondents' perceptions of CBNRM.

Regression analysis: Regression analysis was used to explore relationships between dependent and independent variables. For instance, researchers examined how community participation (independent variable) influenced perceived benefits of CBNRM (dependent variable). The regression analysis revealed a positive and significant relationship between community participation and perceived benefits, suggesting that higher levels of community participation were associated with greater perceived benefits from CBNRM initiatives.

Correlation analysis: Correlation analysis measured the strength and direction of associations between variables. For example, researchers analyzed the correlation between household size and perceived benefits of CBNRM. The analysis showed a weak negative correlation, suggesting that larger household sizes were associated with slightly lower perceptions of benefits from CBNRM initiatives.

6.2 In-depth interview findings

The findings from in-depth interviews with key stakeholders involved in CBNRM initiatives offer an understanding of the challenges and dynamics associated with advancing environmental justice in developing nations. These interviews allowed for an exploration of participants' viewpoints, experiences and emotions regarding CBNRM's influence on environmental justice. The discoveries from these interviews can be summarized as follows:

- *Power dynamics and decision making:* Power dynamics significantly shape CBNRM outcomes and their impact on environmental justice. Interviews exposed that decision making often follows top-down patterns, with limited community engagement. A government official

from Zimbabwe highlighted that while community participation is valued, bureaucrats ultimately make final decisions. Enhancing inclusivity and transparency in decision-making processes emerged as a key area for improvement.

- *Implementation challenges:* Numerous challenges surfaced in CBNRM implementation, hampering its effectiveness. Scarce financial resources emerged as a major hindrance, impacting sustainable resource management activities. Additionally, insufficient technical expertise was identified as a barrier to success. Addressing these hurdles is critical to optimizing CBNRM's positive effects on environmental justice.
- *Empowerment and capacitation:* The interviews underscored the pivotal role of empowering local communities to take charge of natural resource management. Empowered communities exhibited increased participation in decision making and advocacy for environmental rights. Nonetheless, there is a call for enhancing the capacitation of community structures involved in CBNRM initiatives to ensure informed participation.
- *Ecological resilience and conservation:* Views on CBNRM's impact on ecological resilience and conservation varied. While some praised its positive influence on biodiversity preservation, concerns were raised about there being insufficient enforcement mechanisms to deter illegal resource extraction. This emphasizes the need for robust governance to safeguard natural resources and ensure long-term ecological sustainability.
- *Social equity and inclusivity:* Interviews delved into CBNRM's contribution to social equity and inclusivity. While it empowered marginalized groups, such as women and youth, there were instances of certain community members feeling excluded. Strides have been made in promoting social equity, but ensuring the comprehensive inclusion of all stakeholders remains a goal.
- *Environmental justice outcomes:* Interviews shed light on perceived CBNRM outcomes in terms of environmental justice. Improvements in clean water access, reduced deforestation and sustainable agriculture practices were commonly cited. CBNRM was credited with reducing conflicts over resources and enhancing benefits distribution. However, stakeholders acknowledged the ongoing nature of the journey toward environmental justice, necessitating multi-dimensional solutions.
- *Collaboration and partnerships:* The interviews underscored the vital role of collaboration and partnerships in advancing CBNRM objectives. NGOs were highlighted for their technical expertise and ability to foster cooperation among diverse stakeholders. Strong partnerships emerged as instrumental in achieving common goals of environmental justice.

6.3 Focus group discussion insights

The focus group discussions offered insights into community members' perceptions, concerns and hopes relating to CBNRM initiatives and their implications for environmental justice. These discussions facilitated collective sharing of knowledge and viewpoints, leading to the emergence of shared perspectives. Here are the key insights distilled from the focus group discussions:

- *Local perspectives on environmental challenges:* Participants voiced their perspectives on the environmental challenges their communities face. In the Hwange district, the depletion of water resources due to climate change and human activities was a major concern. The Deka

River's pollution from Chinese mining activities exacerbated the issue. In the Lupane district, participants noted that unsustainable logging practices were damaging local ecosystems and livelihoods. These perspectives contextualized the challenges CBNRM aims to address.

- *Community participation and decision making:* The discussions underscored the importance of community participation and decision making. Participants desired more active roles in natural resource management decisions. It became evident that despite the intention to facilitate community-based management, certain programmes, such as the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE),¹⁰ remained centralized. Calls for inclusive and transparent decision-making processes highlighted the need for benefits to reach all community members.
- *Socioeconomic benefits of CBNRM:* The focus groups revealed limited positive responses regarding the socioeconomic benefits of CBNRM initiatives. In the Lupane district, community members expressed minimal positive impacts on their livelihoods, with some feeling that benefits primarily reached those in administrative positions. Discussions highlighted the need for CBNRM projects to contribute to income generation, poverty alleviation and improved access to social services.
- *Women's empowerment and gender equality:* The discussions highlighted CBNRM's role in promoting women's empowerment and gender equity. Women in the Hwange district emphasized the need for greater participation in decision making and income-generating activities within CBNRM initiatives. These insights showcased the potential of CBNRM to challenge traditional gender norms and empower women as agents of change.
- *Challenges and barriers:* Participants discussed the challenges and barriers encountered in CBNRM implementation. In Hwange, where mineral resources abound, inclusivity in resource management emerged as a significant challenge. Limited access to financial resources was a common obstacle in the Lupane district. The lack of legal recognition for community land rights and traditional knowledge posed concerns in both districts. These challenges underscored the need to address policy and institutional barriers for effective CBNRM.
- *Building stronger partnerships:* The need for stronger partnerships emerged as a recurring theme in the discussions. Participants stressed the importance of collaboration among local communities, government agencies and NGOs to enhance CBNRM initiatives. The need for expertise and support from various organizations to improve CBNRM's effectiveness became evident.
- *Long-term sustainability and resilience:* Aspirations for the long-term sustainability and resilience of CBNRM projects were evident. Participants expressed a desire for future generations to inherit a healthy environment and abundant resources. This long-term perspective emphasized the significance of maintaining ecological resilience and ensuring the enduring effectiveness of CBNRM efforts.

¹⁰ CAMPFIRE was initiated in 1989 by the Government of Zimbabwe. It was designed to promote sustainable wildlife management by devolving authority and redistributing benefits from wildlife to local communities. CAMPFIRE operates by granting rural districts the rights to manage and benefit from wildlife resources within their areas, typically through activities such as eco-tourism, hunting and harvesting of natural resources. Despite its innovative approach, the implementation has sometimes remained centralized, limiting the intended community empowerment and benefit distribution.

6.4 Bridging the gap: The new eco-social contract

The concept of the eco-social contract, as envisaged by UNRISD, embodies a comprehensive framework aimed at integrating social equity, environmental sustainability and economic well-being. It is not a distinct, concrete entity but a conceptual paradigm that guides the transformation of societal norms, policies and practices toward more inclusive and sustainable development. Community-based natural resource management exemplifies the practical application of these principles, making it an ideal vehicle to illustrate how the eco-social contract can be operationalized.

6.4.1 Alignment of CBNRM with the principles of the eco-social contract

- *Universal human rights*: CBNRM initiatives inherently support the principle of universal human rights by empowering local communities, including marginalized groups, to have a say in the management of their natural resources. This participatory approach ensures that the rights of all community members are respected and upheld, promoting social justice and equity.
- *Progressive fiscal policies*: Effective CBNRM initiatives often require progressive fiscal policies that support sustainable development. These policies can include financial mechanisms that reinvest resource revenues into local communities, fostering economic stability and growth. By advocating for fair taxation and redistribution of resources, CBNRM aligns with the vision of progressive fiscal policies that underpin the eco-social contract.
- *Sustainable and just economies*: CBNRM promotes sustainable economic practices by balancing resource extraction with conservation efforts. By ensuring that natural resource use is managed sustainably, CBNRM projects contribute to the development of economies that are both environmentally sound and socially equitable, reflecting the goals of sustainable and just economies.
- *Harmony with nature*: At its core, CBNRM embodies the principle of living in harmony with nature. These initiatives prioritize the conservation of biodiversity and the sustainable use of natural resources, aligning with the eco-social contract's vision of a harmonious relationship between human societies and the environment.
- *Gender justice*: The transformative potential of CBNRM includes promoting gender equity by involving women in decision-making processes and resource management. By challenging traditional gender roles and ensuring that women's voices are heard, CBNRM advances gender justice, a key component of eco-social contracts.
- *Intergenerational solidarity*: CBNRM initiatives are designed with a long-term perspective, ensuring that natural resources are preserved for future generations. This principle of intergenerational solidarity is crucial for maintaining the integrity and sustainability of ecosystems, in line with the Eco-Social Contract's emphasis on future generations' rights and needs.
- *Participatory governance*: The participatory nature of CBNRM fosters inclusive governance structures that empower local communities to take an active role in resource management. This approach exemplifies the principle of participatory governance, ensuring transparency, accountability and collective decision-making, which are central to the eco-social contract.

By aligning CBNRM initiatives with the principles of the eco-social contract, we can create a synergistic relationship that enhances both environmental justice and sustainable development. This alignment not only supports the implementation of CBNRM but also contributes to the broader goal of transforming societal norms and practices toward a more just and sustainable future.¹¹

7. Policy Recommendations

The following policy recommendations emerge from the author's literature review and field work:

Prioritizing inclusive and equitable social contracts: Policy makers should prioritize the development of inclusive and equitable social contracts that are likely to support CBNRM initiatives. This entails recognizing and protecting the rights of marginalized groups, including Indigenous communities, women and youth. By involving these stakeholders in decision-making processes and resource management activities, social contracts can better reflect the diverse needs and aspirations of all community members. The principles of the new eco-social contract, emphasizing inclusivity and participatory governance, should guide the design and implementation of CBNRM initiatives.

Strengthening local governance and institutions: To support effective CBNRM, policy makers should focus on strengthening local governance mechanisms and institutions. This involves fostering collaboration between different stakeholders, building the capacity of local institutions, and promoting transparency and accountability in decision-making processes. By addressing power imbalances and conflicts of interest, the eco-social contract's principles of fair governance can be applied, ensuring that CBNRM initiatives are community-led and locally sustainable.

Reforming policies for environmental justice: Policy makers should review existing laws and regulations to ensure alignment with the principles of environmental justice, community participation and sustainable resource management. Land tenure systems should be revised to grant secure rights to local communities, and traditional knowledge and practices should be recognized and integrated into policy frameworks. With its emphasis on just policy reforms, the eco-social contract can guide the development of supportive regulatory frameworks that enable CBNRM initiatives to thrive.

Promoting innovative financing mechanisms: Policy makers should explore innovative financing mechanisms to secure adequate and sustainable funding for CBNRM initiatives. This may include establishing community-based funds, implementing payment for ecosystem services schemes, and fostering public-private-civil society partnerships. Promoting financial literacy and capacity-building can support efforts to mobilize financial resources effectively, ensuring the long-term viability of CBNRM initiatives.

Fostering community engagement and capacity-building: Policy makers should prioritize community engagement and capacity building to empower local communities in CBNRM efforts. Investing in education and training programmes that enhance knowledge, skills and leadership capacities will

¹¹ Kempf et al. 2022; UNRISD 2021, 2022, 2023.

enable communities to actively participate in decision-making processes and implement sustainable resource management practices. Fostering learning networks and knowledge exchange platforms can help to promote the transfer of scientific knowledge and local traditional knowledge, fostering adaptive and resilient communities.

By integrating these policy recommendations into their frameworks, policy makers can strengthen the impact of CBNRM initiatives in achieving environmental justice and promoting ecological sustainability. Embracing the principles of a new eco-social contract will empower local communities, promote inclusive decision making, and create a more just and equitable approach to natural resource management, ultimately contributing to a sustainable and balanced relationship between society and the environment.

8. Conclusion

In conclusion, our research has illuminated the potential of community-based natural resource management initiatives in driving environmental justice and sustainable resource management in developing countries. The journey began with the hypothesis that inclusive and participatory management practices can lead to more equitable and sustainable outcomes, and our study has validated this hypothesis through comprehensive exploration. By examining case studies from Zambia and Thailand, we have demonstrated how CBNRM fosters community empowerment, enhances biodiversity and contributes to social equity.

Key findings emerged from our study, showcasing relatively positive perceptions of CBNRM initiatives among respondents in Zimbabwe and Zambia. While recognizing their positive impact on the environment, challenges relating to community involvement and equitable benefit distribution underscored the need for more inclusive governance approaches. Empowering women and advancing social equity emerged as vital components of CBNRM's transformative potential. In-depth interviews provided insights into the intricate dynamics of CBNRM implementation, shedding light on power dynamics and financial constraints. Focus group discussions contributed valuable local perspectives on environmental challenges and community desires for participation and sustainable benefits. Our study underscores the relevance of embracing an inclusive approach to CBNRM.

Moving forward, we emphasize the urgency of embracing the policy recommendations we have outlined. Strengthening institutions, promoting community engagement and nurturing ecological resilience are key strategies for impactful and sustainable CBNRM practices. Collaboration among governments, NGOs and various local stakeholders—including community leaders, local businesses and residents—is paramount. These stakeholders play a crucial role in ensuring that CBNRM initiatives are tailored to the unique needs and contexts of the communities they serve.

While our research has provided valuable insights, certain limitations should be acknowledged. Future research could expand the geographical scope and data sources to gain a more comprehensive understanding of CBNRM's potential. Additionally, investigating CBNRM's impact

on broader dimensions of the new eco-social contract and involving external perspectives, such as those from international development agencies, policy makers and academic experts, would enrich the understanding of its transformative role.

The journey toward environmental justice is a collective endeavor. By implementing community-based natural resource management practices guided by a vision for a new eco-social contract, we can pave the way for a harmonious and sustainable future where the well-being of both people and the environment is prioritized.

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Appendix(es)

Appendix 1: Survey questionnaire

Section 1: Demographic Information

No.	Question	Response Options
1.	Gender	Female Male Prefer not to say
2.	Age	16-24 25-39 40-59 60+
3.	Educational Level	Primary Secondary Tertiary
4.	Household Size	Insert Household Size
5.	Location	Insert District, Province and Country

Section 2: Community Perceptions of CBNRM

No.	Question	Response Options
1.	Overall, how would you describe your perception of community-based natural resource management (CBNRM)?	Very positive Positive Neutral Negative Very negative
2.	In your opinion, how has CBNRM impacted the environmental conservation in your community?	Very positive impact Positive impact No impact Negative impacts Very negative impacts
3.	Have you observed any positive changes in the availability of natural resources (e.g., water, forests, wildlife) since the implementation of CBNRM?	Yes, significant improvement Yes, moderate improvement No change Yes, moderate decline Yes, significant decline

Section 3: Community Participation in CBNRM

No.	Question	Response Options
1.	How actively do you participate in decision-making processes related to natural resource management in your community?	Actively participate Occasionally participate Rarely participate Do not participate
2.	Do you feel that your inputs and suggestions are taken into account during CBNRM decision-making processes?	Always Most of the time Sometimes Rarely Never

Section 4: Distribution of Benefits

No.	Question	Response Options
1.	Have you personally experienced any benefits from CBNRM initiatives? (Select all that apply)	Improved livelihoods and income generation Access to better social amenities Enhanced access to natural resources Improved infrastructure development in the community

		Other (please specify)
2.	Do you believe that CBNRM initiatives have led to a more equitable distribution of benefits among community members?	Yes, significantly more equitable
		Yes, moderately more equitable
		No change in benefits distribution
		No, moderately less equitable
		No, significantly less equitable

Section 5: Challenges and Areas of Improvement

No.	Question	Response Options
1.	What do you see as the most significant challenge in effectively implementing CBNRM initiatives in your community?	Lack of financial resources
		Insufficient technical expertise
		Limited support from government agencies
		Lack of awareness and understanding about CBNRM
		Other (please specify)
2.	How do you think CBNRM initiatives could be further improved to better address environmental challenges in your community? (Open-ended response)	Insert response

Section 6: Gender Inclusivity

No.	Question	Response Options
1.	Have you observed any changes in gender inclusivity and women's participation in natural resource management activities since the implementation of CBNRM?	Yes, significant improvement
		Yes, moderate improvement
		No change
		Yes, moderate decline
		Yes, significant decline
2.	In your opinion, how could CBNRM initiatives better promote gender equity and empower women in resource management roles? (Open-ended response)	Insert response

Section 7: Environmental Justice Outcomes

No.	Question	Response Options
1.	In your view, has CBNRM contributed to reducing conflicts over natural resources in your community?	Yes, significantly
		Yes, moderately
		No change
		No, moderately increased conflicts
		No, significantly increased conflicts
2.1	Do you believe that CBNRM initiatives have led to more equitable access to natural resources and environmental benefits among community members?	Yes, significantly more equitable
		Yes, moderately more equitable
		No change in benefits distribution
		No, moderately less equitable
		No, significantly less equitable

Section 8: Collaborative Partnerships

No.	Question	Response Options
1.	How important do you think collaborative partnerships among different stakeholders are for the success of CBNRM initiatives?	Very important
		Important
		Neutral
		Not important
		Not sure
2.	In your experience, what are the key elements that make collaborative partnerships successful in CBNRM? (Open-ended response)	Insert response

Section 9: Long-Term Sustainability and Resilience

No.	Question	Response Options
1.	From your perspective, how can CBNRM initiatives be sustained in the long term to ensure continued environmental benefits?	Stronger community engagement and ownership Supportive government policies and regulations Adequate financial resources and capacity-building support Strong partnerships with NGOs Other (please specify)
2.	How important is it for CBNRM initiatives to focus on maintaining ecological resilience and sustainable resource use for future generations?	Very important Important Neutral Not important Not sure

Section 10: Additional Comments

No.	Question	Response Options
1.	Do you have any additional comments or suggestions regarding community-based natural resource management and its implications for environmental justice in your community? (Open-ended response)	Insert response

Appendix 2: CBNRM in Luangwa Valley, Zambia: Overview of the Lupande Programme

Table 1. CBNRM in Luangwa Valley, Zambia: Overview of the Lupande Programme

Project	Scope	Funding	Implementor	Impact	Lessons
First-Generation CBNRM	Prior to 1996, the programme resembled other southern African community wildlife management initiatives, with authority and benefits focused at the district level. The district council controlled the use of wildlife revenues, leading to limited benefits to the community.	Funded through the Luangwa Integrated Resource Development Project (LIRDP) and controlled by the district council.	Luangwa Integrated Resource Development Project (LIRDP), District Council	1. Limited development impact: Few projects were completed and benefits primarily favored the district council and chiefs. 2. Limited community involvement: Ordinary people had little information and influence over the programme. 3. Lack of transparency and accountability: There were no records of revenue use, leading to suspicion and resentment among the community. 4. Weak link between wildlife and benefits: The public asset model resulted in wildlife revenues being disconnected from tangible benefits to the community, hindering wildlife conservation efforts.	1. Direct benefits to the community are essential for successful CBNRM. 2. The top-down approach may lead to limited benefits and weak community involvement. 3. Revenue transparency and accountability are necessary for community trust and support. 4. Linking wildlife to tangible benefits enhances community attitudes toward conservation. 5. Decentralization of authority is crucial for empowering local communities. 6. Democratic involvement in decision-making is essential for sustainable development. 7. Strong checks and balances are needed to prevent predatory behavior by local leaders. 8. Implementing agencies should prioritize community empowerment and capacity building.
Second-Generation CBNRM	After 1996, the programme shifted to a second-generation CBNRM approach, giving organized villages full control over 80% of wildlife revenues. Wildlife revenues became a private or group asset, and communities decided democratically how to use the funds.	Funded through wildlife revenues generated in the Lupande GMA from hunting concessions and occasional hippo culling.	Community-controlled through Village Action Groups (VAGs) and the South Luangwa Area Management Unit (SLAMU)	1. Strong community involvement: 43 VAGs were formed, meeting regularly and electing committees to decide on revenue use. 2. Improved financial accountability: Only 0.8% of VAG finances were unaccounted for, compared to 40% at the ADC level. 3. Democratization and empowerment: Ordinary people had a say in decision-making, promoting community organization and capacity building. 4. Tangible development impact: Over 150 projects were completed, benefiting the community directly. 5. Positive attitudes toward wildlife: Increased proportion of revenue allocated to wildlife management reflected growing appreciation of wildlife.	1. Direct control and decision-making over wildlife revenues enhance community involvement and empowerment. 2. Democratization and bottom-up approaches foster strong community organization and capacity building. 3. Financial transparency and accountability are critical for building trust and preventing mismanagement. 4. Local ownership of wildlife revenues increases the value of wildlife as a community asset, promoting conservation. 5. Community-led revenue distribution facilitates project implementation and local development. 6. Engaging senior regional politicians can help resolve conflicts and promote sustainable agreements. 7. Strong checks and balances maintain downward accountability even when implementing agencies withdraw. 8. Community training and financial education reinforce sustainable management practices.

Appendix 3: Overview of the CBNRM initiative in Pred Nai Village

Table 2. Overview of the CBNRM Initiative in Pred Nai Village

Project	Scope	Funding	Implementor	Impact	Lessons
Community Mangrove Management, Thailand	Empowering marginalized groups in mangrove management for sustainable resource utilization and livelihood improvement	Supported by various external actors such as governmental agencies, educational institutes, and funding agencies.	Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC) in collaboration with Pred Nai Community Forestry Group	<ul style="list-style-type: none"> Increased income from crab harvest: Crab harvesters caught 49,800 kg in the first 7 months of 2005, earning over 2 million Baht. Restoration of biodiversity: Return of species like Samae monkeys and wetland birds, bees, and other marine products. Equity in political participation: Poor gained channels to influence resource management decisions. Community networking: Collaboration between Pred Nai and neighboring villages through Community Coastal Resource Management Network. Community learning and knowledge exchange: The community learned from successes and failures through networking and information sharing. Positive social and environmental impacts: Restoration of mangroves improved the local ecosystem and biodiversity. 	<ul style="list-style-type: none"> Importance of participatory approach: Involvement of marginalized groups improved mangrove ecosystem and biodiversity. Internal heterogeneity consideration: Understanding the community's diverse needs and respecting their decisions leads to successful CBNRM implementation. Empowering local leaders: Effective community leaders played a crucial role in managing people and resources. It is important to capacitate community structures. Balancing resource utilization: Developing regulations to manage resources sustainably while considering livelihood needs. Networking for wider impact: Establishing networks with other villages and local communities to share knowledge and experiences. Monitoring and adaptation: Action research and continuous monitoring are crucial for adaptive management.

Appendix 4: Survey findings on CBNRM and environmental justice

Table 3. Survey Findings on CBNRM and Environmental Justice

Survey Question	Response Option	Zimbabwe (n=137)	Zambia (n=95)	Total (n=232)
1. Overall Perception of CBNRM	Very Positive	32 (23.4%)	26 (27.4%)	58 (25.0%)
	Positive	66 (48.2%)	38 (40.0%)	104 (44.8%)
	Neutral	31 (22.6%)	22 (23.2%)	53 (22.8%)
	Negative	6 (4.4%)	8 (8.4%)	14 (6.0%)
	Very Negative	2 (1.5%)	1 (1.1%)	3 (1.3%)
2. Impact on Environmental Conservation	Improved significantly	54 (39.4%)	38 (40.0%)	92 (39.7%)
	Improved moderately	51 (37.2%)	33 (34.7%)	84 (36.2%)
	Remained the same	25 (18.3%)	19 (20.0%)	44 (19.0%)
	Worsened moderately	5 (3.6%)	3 (3.2%)	8 (3.4%)
	Worsened significantly	2 (1.5%)	2 (2.1%)	4 (1.7%)
3. Positive Changes in Resource Availability	Yes, significant improvement	70 (51.1%)	45 (47.4%)	115 (49.6%)
	Yes, moderate improvement	45 (32.8%)	31 (32.6%)	76 (32.8%)
	No change	13 (9.5%)	13 (13.7%)	26 (11.2%)
	Yes, moderate decline	6 (4.4%)	5 (5.3%)	11 (4.7%)
	Yes, significant decline	3 (2.2%)	1 (1.1%)	4 (1.7%)
4. Community Participation in Decision-Making	Actively participate	23 (16.8%)	38 (40.0%)	61 (26.3%)
	Occasionally participate	33 (24.1%)	25 (26.3%)	58 (25.0%)
	Rarely participate	48 (35.0%)	23 (24.2%)	71 (30.6%)
	Do not participate	33 (24.1%)	9 (9.5%)	42 (18.1%)
5. Inputs and Suggestions Considered in Decision-Making	Always	12 (8.8%)	21 (22.1%)	33 (14.2%)
	Most of the time	29 (21.2%)	23 (24.2%)	52 (22.4%)
	Sometimes	55 (40.1%)	30 (31.6%)	85 (36.6%)
	Rarely	34 (24.8%)	14 (14.7%)	48 (20.7%)
	Never	7 (5.1%)	7 (7.4%)	14 (6.0%)
6. Personal Experience of Benefits	Improved livelihoods and income generation	54 (39.4%)	35 (36.8%)	89 (38.4%)
	Access to better social amenities	23 (16.8%)	14 (14.7%)	37 (16.0%)
	Enhanced access to natural resources (e.g., water, forests)	44 (32.1%)	25 (26.3%)	69 (29.7%)
	Improved infrastructure development in the community	11 (8.0%)	7 (7.4%)	18 (7.8%)
	Other	5 (3.6%)	8 (8.4%)	13 (5.6%)
7. Perceived Equity in Benefits Distribution	Yes, significantly more equitable	18 (13.1%)	9 (9.5%)	27 (11.6%)
	Yes, moderately more equitable	48 (35.0%)	22 (23.2%)	70 (30.2%)
	No change in benefits distribution	29 (21.2%)	30 (31.6%)	59 (25.4%)
	No, moderately less equitable	23 (16.8%)	20 (21.1%)	43 (18.5%)
	No, significantly less equitable	19 (13.9%)	14 (14.7%)	33 (14.2%)
8. Significant Challenges in Implementation	Lack of financial resources	60 (43.8%)	40 (42.1%)	100 (43.1%)
	Insufficient technical expertise	40 (29.2%)	26 (27.4%)	66 (28.4%)
	Limited support from government agencies	16 (11.7%)	16 (16.8%)	32 (13.8%)
	Lack of awareness and understanding about CBNRM	11 (8.0%)	9 (9.5%)	20 (8.6%)
	Other	10 (7.3%)	4 (4.2%)	14 (6.0%)

9. Gender Inclusivity and Women's Participation	Yes, significant improvement	31 (22.6%)	31 (22.6%)	52 (22.4%)
	Yes, moderate improvement	54 (39.4%)	36 (37.9%)	90 (38.8%)
	No change	28 (20.4%)	21 (22.1%)	49 (21.1%)
	Yes, moderate decline	15 (10.9%)	9 (9.5%)	24 (10.3%)
	Yes, significant decline	9 (6.6%)	8 (8.4%)	17 (7.3%)
10. CBNRM's Impact on Reducing Conflicts	Yes, significantly	40 (29.2%)	28 (29.5%)	68 (29.3%)
	Yes, moderately	52 (38.0%)	36 (37.9%)	88 (37.9%)
	No change	21 (15.3%)	14 (14.7%)	35 (15.1%)
	No, moderately increased conflicts	9 (6.6%)	10 (10.5%)	19 (8.2%)
	No, significantly increased conflicts	15 (10.9%)	7 (7.4%)	22 (9.5%)
11. Equitable Access to Environmental Benefits	Yes, significantly more equitable	26 (19.0%)	13 (13.7%)	39 (16.8%)
	Yes, moderately more equitable	54 (39.4%)	31 (32.6%)	85 (36.6%)
	No change in benefits distribution	29 (21.2%)	31 (32.6%)	60 (25.9%)
	No, moderately less equitable	18 (13.1%)	15 (15.8%)	33 (14.2%)
	No, significantly less equitable	10 (7.3%)	5 (5.3%)	15 (6.5%)
12. Importance of Collaborative Partnerships	Very important	44 (32.1%)	24 (25.3%)	68 (29.3%)
	Important	69 (50.4%)	48 (50.5%)	117 (50.4%)
	Neutral	17 (12.4%)	14 (14.7%)	31 (13.4%)
	Not important	4 (2.9%)	5 (5.3%)	9 (3.9%)
	Not sure	3 (2.2%)	4 (4.2%)	7 (3.0%)
13. Sustaining CBNRM Initiatives for Environmental Benefits	Stronger community engagement and ownership	47 (34.3%)	35 (36.8%)	82 (35.3%)
	Supportive government policies and regulations	46 (33.6%)	26 (27.4%)	72 (31.0%)
	Adequate financial resources and capacity-building support	20 (14.6%)	21 (22.1%)	41 (17.7%)
	Strong partnerships with NGOs	15 (10.9%)	10 (10.5%)	25 (10.8%)
	Other	9 (6.6%)	3 (3.2%)	12 (5.2%)
14. Focus on Ecological Resilience for Future Generations	Very important	60 (43.8%)	39 (41.1%)	99 (42.7%)
	Important	62 (45.3%)	40 (42.1%)	102 (44.0%)
	Neutral	9 (6.6%)	12 (12.6%)	21 (9.1%)
	Not important	3 (2.2%)	3 (3.2%)	6 (2.6%)
	Not sure	3 (2.2%)	1 (1.1%)	4 (1.7%)