

THE CONTRIBUTIONS,
PERSPECTIVES AND
RECOMMENDATIONS OF
INDIGENOUS PEOPLES ON

NATURE-BASED SOLUTIONS



The Contributions, Perspectives and Recommendations of Indigenous Peoples on Nature-Based Solutions

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Abbreviations

ACHPR	African Charter on Human and Peoples' Rights
ACHPR	African Commission on Human and Peoples' Rights
AECID	Spanish Agency for International Development Cooperation
AEs	Accredited Entities
AFD	French Development Agency
AIWO-CAN	African Indigenous Women Organization Central African Network
AU RSS	African Union Regional Sensitisation Seminar
Art.	Article
BBR	Bosawas Biosphere Reserve
BDP	Productive Development Bank (Bolivia)
CBD	Convention on Biological Diversity
CBDR	Common but differentiated responsibilities
CBF	Congo Basin Forest
CBOs	Community-based organizations
CCF-A	Environmental Forestry Advisory Council
CED	Centre for Environment and Development
CELADE	Latin American and Caribbean Demographic Centre
CH ₄	Methane
CIEDD	Centre for Environmental Information and Sustainable Development
CIPTA	Tacana Peoples Indigenous Council
CMNUCC	United Nations Framework Convention on Climate Change
CO ₂	Carbon dioxide
COINCABOL	Bolivian Indigenous Peoples' Organizations Coordinator
COMIFAC	Central African Forest Commission
COP	Conference of Parties
CPE - PB (PCPSB)	Political Constitution of the Plurinational State of Bolivia
CSD	Commission on Sustainable Development
CSOs	Civil society organizations
DCDP	Djoum Council Development Plan
DSCE	Document de Stratégies pour la Croissance et l'Emploi

ECLAC	Economic Commission for Latin America and the Caribbean
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAPI	Federation for the Self-Determination of Indigenous Peoples
FCFA	Franc de la Coopération Financière d'Afrique
FCPF	Forest Carbon Partnership Facility
FCP	Forest Convergence Plan
FDA/AFD	French Development Agency
FDI	Indigenous Development Fund
FEICOM	Fonds spécial d'équipement et d'intervention intercommunale (Special Council Support Fund for Mutual Assistance)
FILAC	Fund for the Development of Indigenous Peoples of Latin America and the Caribbean
FLEGT	Forest Law Enforcement, Governance and Trade
FODER	Organization for Forests and Rural Development
FP	Focal Point
FPIC	Free, prior and informed consent
FPP	Forest Peoples Programme
GCF	Green Climate Fund
GCI	Indigenous Community Government
GDP	Gross Domestic Product
GESP	Growth and Employment Strategy Paper
GHG	Greenhouse gas
GITK	Indigenous Territorial Government of Karatá
GoC	Government of Cameroon
GWP	Global Water Partnership
HRC	UN Human Rights Council
IAP	Indigenous and Afro-descendant Peoples
ICG	Indigenous Communal Government
IDB	Inter-American Development Bank
IDF	Indigenous Development Fund
IDNCs	Intended Nationally Determined Contributions
INIDE	National Institute for Development Information
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Inter-governmental Panel on Climate Change
IRAD	Institute of Agricultural Research for Development
IUCN	International Union for the Conservation of Nature
IWGIA	International Work Group for Indigenous Affairs
KITG	Karata Indigenous Territorial Government

MARENA	Ministry of the Environment and Natural Resources
MDRyT	Bolivian Ministry of Rural Development and Land
MINADER	Ministry of Agriculture and Rural Development
MINAS	Ministry of Social Affairs
MINATD	Ministry of Territoriale Administration and Decentralization
MINEE	Ministry Water and Energy
MINEPAT	Ministry of Economy, Planning and Regional Development
MINEF	Ministry of Environment and Forestry
MINEPDED	Ministry of Environment, Protection of Nature and Sustainable Development
MINEPIA	Ministry of Fishery and Animal Husbandry
MINFOF	Ministry of Forestry and Wildlife
MINHDU	Ministry of Housing and Urban Development
MINTRANS	Ministry of Transport
MYPYME	Micro, Small, or Medium Businesses
N ₂ O	Nitrous oxide
NAPCC	National Climate Change Adaptation Plan
NBS	Nature-based Solutions
NBSAP	National Biodiversity Strategy and Action Plan
NBSAP II	National Biodiversity Strategy and Action Plan II
NCS	Natural Climate Solutions
NDA	National Designated Authority
NDC	Nationally Determined Contributions
NGO	Non-Governmental Organizations
NIPACC	National Investment Plan for Adaptation to Climate Change
NOCC	National Observatory on Climate Change
NPFE	Non-permanent forest estate
ONF	Open Networking Foundation
ONR	National Observatory of Risk
PAHO	Pan American Health Organization
PDB	Productive Development Bank of Bolivia
pers.comm	Personal communication
pers.obs	Personal observation
PFE	Permanent forest estate
PIA	Indigenous and Afro-descendant Peoples
PNGE	National Plan for Environmental Management
PREPAC	Platform for REDD+ and Indigenous Peoples of Cameroon
R-PIN	Readiness Plan Idea Note
R-PP	Readiness Preparation Proposal
RACCN	North Caribbean Coast Autonomous Region
RACOPY	Réseau de Recherche - Actions Concertées Pygmées

RBB	Bosawas Biosphere Reserve
REDD+	Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
RIP/C	Rights of Indigenous Populations/Communities
SCF	Standing Committee on Finance
SDGs	Sustainable Development Goals
SMP	Simple Management Plan
TCO	Native Community Land
UFAs	forest management units
UNFCCC	United Nations Framework Convention on Climate Change
UN	United Nations
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
USAID	United States Agency for International Development
VPA	Voluntary Partnership Agreement
WCC	World Conservation Congress
WGIP	Working Group on Indigenous Populations
WWF	World Wide Fund for Nature
YIAA	Youths In Alternative Action Association
ZICGCS	Zone d'Intérêt Cynégétique à Gestion Communautaire (Community-managed hunting zone)

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Synthesis, Recommendations and Ways Forward

By Marisa Cabato, Helen Biangalen-Magata and Grace Balawag

The scoping study on Indigenous Peoples and Nature-based Solutions is meant to provide an evidence-based narrative that demonstrates how Indigenous peoples are key actors and partners in climate action through nature-based solutions. It also presents an opportunity to enrich the discussions that will strengthen NBS that advance and engage Indigenous peoples and to generate support from all stakeholders in promoting and protecting Indigenous peoples' rights.

The presentation focuses on two areas.

First are the summary highlights that provide understanding of the research context by looking at current situations of Indigenous peoples in the three regions as research areas. This intends to provide answers to the following inquiries: What are the perspectives of Indigenous peoples on nature or the natural environment and nature-based solutions? What and how are NBS practiced by them through their traditional knowledge systems and practices? What are the Indigenous peoples' proposed elements for effective NBS?

The second area integrates the recommendations and ways forward to be undertaken as a result of the research study. Most importantly, it emphasizes the key principles and perspectives drawn from evidence-based documentation.

UNDERSTANDING THE CONTEXT: INDIGENOUS PEOPLES' SITUATIONS

Six country case studies across three regions are highlighted in this research endeavor: Nepal and Indonesia in Asia, Bolivia and Nicaragua in Latin America, and Kenya and Cameroon in Africa.

It is good to locate the Indigenous peoples and know their concerns and challenges as reported in these country studies. Areas occupied by Indigenous peoples are usually carefully managed by them. Most ecosystems studied include forests, dry lands, and marine and coastal environments. Indigenous peoples are culturally diverse, speaking diverse languages and practicing unique and diverse traditions and heritage, which were shaped by their history, their story and natural environment.

Indigenous peoples' territories overlap with biodiversity areas, which results in conflict in land use policies such as conservation and protected areas. They are evicted from their territories because of these state conservation policies, implementation of development projects and non-recognition of their land rights. While they occupy resource-rich areas, they remain marginalized, poor and most vulnerable, especially women, against the climate challenges, the global COVID-19 pandemic and other socio-cultural and political factors.

Indigenous peoples are also excluded from mainstream and development processes, including planning to implementation and monitoring and evaluation. Further, their indigenous and traditional knowledge and customary governance, which have been proven effective and sustainable, are not recognized. Moreover, they are confronted with land and resource use change. We see conversion of land use, fragmentation of land areas through sale and fencing programs that limit the mobility of peoples and animals, as in Africa. This shifting land and resource use advances market or profit-oriented development paradigms, which are unsustainable and detrimental to Indigenous peoples and the natural environment. In terms of land ownership, we see a shift from communal or collective to private ownership, as in the case of Kenya and the other countries studied. With all these shifts, we are now experiencing the shrinking resource base, degradation, overuse, deforestation among the brown, blue and green natural environment.

Further, we are looking at identity loss with the threat to Indigenous peoples' existence and weakening of their social institutions. Regarding the access to finance institutions and resources from the government, they get minimal to no support at all in financing their own climate change solutions. Finally, legislative and policy frameworks on Indigenous peoples, climate change and nature-based solutions are not strong enough or aggravate the non-recognition of Indigenous peoples' rights. This legal support varies from country to country like in the case of the Pygmies in Cameroon where the government does not recognize their identity as Indigenous peoples and their land tenure rights, customary governance, indigenous knowledge and traditional knowledge. These policies and frameworks are also not coherent, weakly enforced and implemented, and gaps remain in understanding policy contexts among policy makers, among others.

INDIGENOUS PEOPLES' PERSPECTIVES ON NATURE AND NBS

To Indigenous peoples, nature or the physical or natural environment provides a complex interdependence of all life forms. It is home; it is referred to as the foundation of life, cradle of life, focal point of life, or spaces for life, which is the basis of identity and ensures survival.

On nature-based solutions, it is a contention between NBS as old versus new climate change solutions. However, Indigenous peoples look at it as an old one, a practice and a system since time immemorial, handed down from the past to the present generation. In terms of focus and purpose, are people and nature separate or one? Indigenous peoples look at people and nature as co-existing, in harmony and unity with each other that results in sustainable resource uses and promotes good living. It emphasizes interdependence of cultural and biological diversity.

Finally, despite varied and opposing views on nature-based solutions, it is an opportunity for Indigenous peoples' engagement in advancing their rights and advocacies, in climate action in particular.

INDIGENOUS, TRADITIONAL AND LOCAL KNOWLEDGE SYSTEMS AND PRACTICES AND NBS

In Asia, these indigenous knowledge systems and practices are demonstrated through indigenous leadership and customary institutions for forest and biodiversity conservation and through local wisdoms, such as the “Seven Fortunes of the Dayak” in Indonesia, that are rooted in a harmonious relationship between humans and nature.

In Africa, the Indigenous peoples’ practices on mobile herd grazing, land use zoning and biocultural seasonal calendar prove to sustain the land and biodiversity. Their community-based monitoring systems are adaptable and demonstrate practical knowledge in sharing systems. These also include traditional occupations and maintained health and well-being and basic survival. More so, their culture and religion play an important role in conservation practices, reforestation and domestication, and agroforestry practices.

In Latin America, nature-based solutions are demonstrated in their sustainable ecotourism management regulations based on customs, traditions and governance systems—as in the case of Bolivia—and conservation, knowledge preservation, territorial and community governance—as in Nicaragua.

It is reiterated in these studies that nature-based solutions through indigenous knowledge systems and practices are dynamic and promote intergenerational sharing. These are shared, collectively practiced, promote reciprocity, and sustain growth and development.

PROPOSED NBS ELEMENTS BY AND FOR INDIGENOUS PEOPLES

The research studies reiterate the following:

- Nature-based solutions should be anchored on the recognition, respect and promotion of human rights and Indigenous peoples’ rights and Indigenous peoples as active partners in NBS and climate action.
- A rights-based approach that puts the recognition of the rights of Indigenous peoples, their identity, land and territories, self-determined development, customary governance systems and institutions such as the council or community of elders and leaders, and the protection of their rights through free prior and informed consent as the foundations of nature-based solutions.
- A NBS framework that recognizes the inseparable relationship of people, nature and culture.
- A NBS that recognizes the indigenous knowledge systems and practices, culture, traditions, spirituality, belief systems and value systems of Indigenous peoples.
- A NBS that promotes social justice through equitable resource and benefit sharing and access to social services.

- An effective NBS framework that is supported by enabling laws and policies and relevant institutional arrangement for strong governance systems and institutions and fiscal support.

RECOMMENDATIONS AND WAYS FORWARD

Key recommendations and ways forward were drawn as a result of integrating the findings from the six country case studies.

1. For States/governments, non-state actors and multilateral bodies

- Recognize, respect and promote Indigenous peoples' rights to their identity, culture, land and territories, self-governance, self-determined development, social justice and benefit-sharing. Respect and promotion of indigenous rights should be consistent with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), integrating robust and effective safeguards to address challenges. Support land tenure transitions towards securing customary land tenure for Indigenous peoples. Integrate indigenous knowledge systems and practices within their nationally determined contributions (NDCs), national climate action plans and national climate response strategies.
- Strengthen representation, full and effective engagement, consultation protocols of Indigenous peoples in decision making and development processes, from planning to implementation to monitoring and evaluation. Development should be inclusive, participatory, and respect self-determination. Enhance direct access of Indigenous peoples to finance resources that are upscaled, accessible, equitable, and long-term. Provide support that empower Indigenous peoples through capacity-building programs that will enrich their knowledge and skills.
- Recognize and promote human rights-based development and policy approaches that support Indigenous peoples' ways of life. Improve and promote disaggregated data on national and global statistics relevant to Indigenous peoples, such as national product accounts and measurement of valuation of resource metrics, among others. Pro-actively support documentation of indigenous and traditional practices, and sustain and enhance reporting and knowledge sharing efforts on various documentation and reports on Indigenous peoples' initiatives and actions at various platforms such as the Intergovernmental Panel on Climate Change of the United Nations Framework Convention on Climate Change (UNFCCC).
- Develop and expand partnerships in generating knowledge, especially identifying relevant indicators on traditional knowledge and well-being of Indigenous peoples. Recognize and promote human rights-based approach in nature-based solutions, with emphasis on people, culture and nature as one. Promote and support exchanges in knowledge platforms at various levels (UNFCCC-Local Communities and Indigenous Peoples Platform, regional and national knowledge platforms). Develop policy frame-

work for sustainable production and consumption, which enables immediate upscaling of sustainable economies and revitalizing indigenous food systems.

- Strengthen and provide relevant institutional spaces for Indigenous peoples' effective engagement at local and national levels, as in the case of Cameroon, where Indigenous peoples are engaged with the Ministry of Social Affairs for Environment, Protection of Nature and Sustainable Development. Also, recognize and strengthen customary governance systems and the role of community elders and leaders.

2. For Indigenous Peoples

- Strategize and sustain lobbying and advocacy efforts on their rights at various levels. Sustain engagements on NBS and climate action, among others, and expand partnerships and collaboration with other stakeholders who are committed to the advocacies of Indigenous peoples, such as artists, filmmakers and others. Continue building capacities, knowledge and skills on documentation, development process, monitoring, organizational development, and leadership, among others.

3. For Civil Society Organizations

- Conduct sensitization, education, and consultation in designing related projects and programs in Indigenous peoples' communities or close to their communities. This was specifically recommended by the country case study of Cameroon. In the immediate present, Tebtebba and partners should furnish copies of the research report to stakeholder country governments and other multilateral bodies as basis for policy inputs, academe, CSOs, Indigenous peoples' communities for information, reference and adaption. It is worth mentioning that Cameroon is undergoing revision of the Wildlife Law of 1994. The result of this research study is very relevant as an input to the Cameroon endeavor of revising this particular law.

In conclusion, Tebtebba and Elatia Partners note these recommendations and insights from the discussions. It has been a very fruitful exchange and learning. Tebtebba with the Elatia Partners will pursue the plan to popularize all these efforts and initiatives of Indigenous peoples not only among governments but also using other platforms to gain wider support among civil societies and other stakeholders who are pushing for and elaborating on the centrality of rights in nature-based solutions to make this genuinely responsive to the issues and concerns of Indigenous peoples.

Kenya: A Maasai Pastoralist Perspective of Nature-based Solutions

By Kimaren Ole Riamit

INTRODUCTION

Indigenous peoples are one of the most, if not the most, vulnerable to the impacts of the COVID-19 pandemic, given their continuing marginalization. This doubles if not triples the burden that they are already experiencing due to climate change impacts. In this current crisis, Nature-Based Solutions (NBS) have a huge potential to contribute in addressing many of the impacts of the pandemic. This will include not only supporting communities' abilities to address immediate impacts of the pandemic but more importantly in helping create a more sustainable and resilient post-COVID world. For Indigenous peoples (IP), this potential can only be genuinely realized if framed and implemented by states correctly. This would mean NBS that are human-rights-centered and that recognize and support Indigenous peoples' rights including their rights to their lands, forests and territories; their traditional knowledge, practices and innovations; and their overall contributions to sustaining and maintaining the environment, including to climate adaptation and mitigation.

At global level, efforts are underway to operationalize NBS. The UN Framework Convention on Climate Change (UNFCCC) Standing Committee on Finance (SCF) is preparing for its forum in 2021 that will look into financing nature-based solutions. The SCF provides advice to the UNFCCC Conference of Parties (COP) and ultimately to the Green Climate Fund (GCF). In the GCF, there is a growing momentum of NBS as a key factor in the future GCF portfolio. The Fund is currently developing its various sectoral guidance that aims to guide Accredited Entities (AEs) in preparing their portfolio. One of the sectoral guidance being developed is on land and forests, which is looking at nature-based solutions as a potential theme for GCF proposals.

Prior to the pandemic, efforts had been made by some indigenous peoples' organizations to feed into the discussions and initiatives on NBS being undertaken globally.¹ While Tebtebba believes that Indigenous peoples are actually practicing NBS already, a comprehensive understanding by indigenous peoples' organizations of NBS as defined by external actors is still lacking. In the same manner, a synergized action and strategies on how to engage with bodies pushing NBS still need to be developed.

The GCF's Indigenous Peoples Policy, in our view, captures the spirit and intent of what NBS is for Indigenous peoples.² Its full and effective implementation will support and strengthen recognition of IP perspectives and priorities in NBS. As such, it is critical to look at how the Fund has been implementing its own Indigenous Peoples Policy in terms of assessing, approving and monitoring approved funding proposals. However, a gap remains in terms of understanding the entire GCF portfolio to date in relation to IP as there is no complete picture as to how many projects are going to be implemented in IP territories, what these projects look like and how they are likely to impact Indigenous peoples. This project therefore aims to address these problems by working towards ensuring that recognition and support for IP rights, priorities and perspectives are central to the discourse, design and funding of NBS within key climate policy fora, in particular, in the Green Climate Fund and the UNFCCC Standing Committee on Finance.

Indigenous peoples' traditional livelihood production systems represent the epitome of integrated actions on climate, nature, and people – which are intergenerationally tested and proven. The case and practice of pastoralists, who for centuries have successfully eked a living within deserts, arid and semi-arid rangelands of our globe, exemplifies these approaches.

For Maasai pastoralists in East Africa, people and nature are inseparable – the people (social) are reflected in nature (through totems and taboos), while nature is reflected in people (social) through rites of passage (use of plants), sacred sites and trees. Land and natural resources are held collectively, managed through vibrant indigenous knowledge systems and practices, regulated through environmentally friendly customary law enforced through robust indigenous institutions.

Adaptation to climate variability is the daily rhythm of life in the rangelands. Livestock and people mobility in response to the disequilibrium nature of the rangeland ecosystems - water and pasture scarcity, avoidance of disease - so as to enhance the interdependence and complementarity of the diverse ecosystems is an intergenerationally tested and proven resilience building strategy.

This study endeavors to capture and reflect on the concept and practice of nature-based solutions as understood, practiced, and articulated by Indigenous peoples. It focuses on the Maasai in Kenya who practise nomadic and agro-pastoralist livelihoods within the arid and semi-arid rangelands of East Africa. The study relied mostly on secondary data with limited field-based primary data due to the constraints occasioned by the COVID-19 restrictions. It drew insights from a rich array of literature produced by several indigenous peoples' networks, including the Indigenous Peoples Global Network on Climate Change and Sustainable Development (IPGNCCSD) and the Indigenous Peoples Partnership on Climate Change and Forests, of which the Indigenous Livelihoods Enhancement Partners (ILEPA) is an active member. In addition, virtual key informant interviews were made to clarify concepts, harvest new insights and validate the study findings. The study findings were also presented to an African Indigenous Peoples Leaders Webinar for critique and validation.

NATURE-BASED SOLUTIONS: CONCEPTS AND INDIGENOUS PEOPLES' PERSPECTIVES

The term 'nature-based solutions' emerged during negotiations under the UN Framework Convention on Climate Change in 2009 and refers to a bundle of possible responses to the need for mitigating and adapting to climate change. The term was more clearly outlined in a 2016 Resolution from the International Union for the Conservation of Nature (IUCN) as broadly referring to: "actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits." Further clarity on NBS is slowly unfolding particularly within the negotiations of the UN Convention on Biological Diversity (CBD) towards a post-2020 Global Biodiversity Framework and within UNFCCC.

Transforming our World: The 2030 Agenda for Sustainable Development brings together biodiversity conservation, climate change and sustainable development under a common universal agenda. The point of departure for the clarion call for NBS is an equivocal recognition that climate is changing rapidly, undermining the security of current and future generations. But also, there is the imminent biodiversity collapse which, put together with climate change, presents a double crisis for our planet. Nature-Based Solutions underpin the Sustainable Development Goals; they support vital ecosystem services, biodiversity, access to fresh water, improved livelihoods, healthy diets and food security from sustainable food systems.

NBS themes could encompass a range of elements such as scaling up the preservation and restoration of forests, land and marine ecosystems; conservation and restoration of wetlands; comprehensive treatment of soil erosion; prevention of desertification, climate resilient infrastructure and connectivity; eco-corridors and protection of biodiversity; climate compatible agriculture and food systems; regenerating ecosystems of the ocean and natural reserve systems with national parks as the mainstay.³

An endangered planet with inherent remedies: nature's huge potential in natural resource sustainable use and management

According to the Food and Agriculture Organization (FAO), the rationale for pushing forward NBS approaches in the context of climate change and sustainable development is that the sector is a significant source of greenhouse gases but has the most feasible potential for mitigating further emissions and enhancing carbon sequestration. Agricultural, Forest and Land Use (AFOLU) contributes about 24% of all greenhouse gases, yet still has an existing feasible GHG abetting potential of at least 44%.⁴

An alliance of governments on Natural Solutions for climate change, brought together in the lead up to the UN Secretary General's Climate Summit in September 2019, also reports that the land sector emits a quarter of greenhouse gas emissions globally -- around 10-12 billion tons of

CO₂ per year. And with the right and stronger action, the sector can deliver one-third of the mitigation required by 2030 to remain below a 2°C increase in average global temperatures in addition to conserving biodiversity, increasing food and water security, augmenting overall well-being of human societies and help achieve sustainable development goals by reversing degradation of land and marine ecosystems, thereby enhancing cost-effective climate mitigation actions.⁵

Natural habitats, plants and animals, and the benefits that people receive from nature are declining at an alarming rate, in large part as a direct result of the expansion of agribusiness and extractive industries fueled by the current economic growth paradigm. Their decline is slower in the lands, waters and territories of Indigenous peoples than elsewhere as a result of their governance, values and practices, but they are still under great pressure.⁶

The work by FAO on Ecosystem Restoration through NBS in climate action indicates that land degradation is negatively impacting at least 3.2 billion people and costing over 10 percent of the annual global gross product in loss of biodiversity and ecosystem services and contributing 3.6–4.4 Gt of CO₂ annual global emissions between 2000 and 2009 alone.

Restoration increases the capacity of ecosystems to absorb and store carbon, availability of fertile agricultural land and natural resources and hence reduces carbon emissions; healthy ecosystems are better able to cope with shocks and adapt to change such as restored watersheds increase drinking water supplies and buffer against both floods and droughts; socially and economically restoration creates jobs particularly in rural areas (farmers, fishers, forest owners, herders can enjoy higher and more sustainable yields), including enhancing the opportunities of future generations.

Why the focus and interest on IP territories in NBS discourses and actions?

Indigenous peoples occupy and use 22% of the world's land, harboring 80% of the world's biological diversity (UNDP 2011: 54). They number at least 370 million, representing a significant portion of the world's cultural diversity, including about 7,000 languages.

According to a Rights and Resources Initiative (RRI) report, the 1.8 billion population-strong Indigenous peoples, Afro-descendant peoples, and local communities claim, live in and steward the earth's most critical ecosystems that are home to most of the global biodiversity. These ecosystems are estimated to store approximately 800 GtCO₂e (25 x global 2020 emissions) forest carbon stocks in tropical forested countries that these communities are in, which are at risk of conversion by outside actors.

Specifically, Indigenous Peoples and Local Communities (IPLCs) are acutely experiencing the loss of biological and cultural diversity. These losses stem from unsustainable global systems of values, knowledge, governance, production, consumption, technology, economics, incentives, and trade, all underlain by unequal decision-making power regarding the future of nature and peoples. The roots of these problems lie in the prevailing view of humans as separate from nature and in value systems that favor individual interests and profit-making. Nature is seen as an

economic resource to be exploited and its degradation is treated as an externality of mainstream economics.

The Local Biodiversity Outlook (LBO) report underscores the point that worldviews that separate nature and culture are an underlying cause of biodiversity loss, as cultures condition behaviors and frame people's relationships with other people and with the natural world. The holistic and diverse value systems and ways of life of Indigenous peoples across the world offer culturally distinctive visions of alternative sustainable futures which need to be understood, respected, and protected across the whole of government, economy and society (LBO:2 p.19)

Further, the report avers that IPLCs make distinctive contributions to meeting global goals in an integrated and holistic way. Placing them at the center of implementation delivers a triple win, bringing together the fulfilment of human rights and well-being, the conservation and sustainable use of biodiversity, and the maintenance of natural ecosystems to manage climate change. Cultural diversity is a creative source and enabler for sustainable development. Culture provides peoples and communities with a strong sense of identity and social cohesion. Policies responsive to cultural contexts can yield better, sustainable, inclusive, and equitable development outcomes. Progress in meeting the pledge to leave no one behind requires robust monitoring frameworks engaging those most directly experiencing social exclusion and structural discrimination.

Indigenous knowledge systems and practices: an unrecognized and devalued resource

Indigenous knowledge refers to knowledge and know-how that have been accumulated across generations and which guide human societies in their innumerable interactions with their surrounding environment. Specifically, traditional ecological knowledge is a cumulative body of knowledge, practice and belief evolving by adaptive processes, renewed, and handed down through successive generations by cultural transmissions about the relationship of people themselves and with nature.

As demonstrated above, this knowledge is connected to the well-being of the people, e.g. food from hunting, gathering, pastoralism or subsistence agriculture, as well as health care, clothing, shelter and strategies for coping with environmental fluctuations and external forces of exchange (Warren et al., 1995; Nakashima and Roue, 2002; Silioe et al., 2002).

Indigenous, local, and traditional knowledge systems and practices, including Indigenous peoples' holistic view of community and environment, are a major source of adaption to climate change, but these have not been acknowledged and accounted for in the context of NBS. Customary natural resource management systems based on indigenous/traditional knowledge have sustainably contributed to lower rates of deforestation and forest carbon emissions than other areas and maintained higher levels of biodiversity, resulting in more resilient landscapes within IPs territories. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation (IPCC, 2014:27).

Ongoing disregard of the vital contributions of Indigenous peoples and local communities to biodiversity conservation, sustainable use and response to climate change constitutes a major missed opportunity in efforts to promote sustainable people-nature relations, including nature-based solutions to climate change.⁷ Putting the cultures and rights of Indigenous peoples at the heart of response measures to environmental related challenges would deliver sustainable livelihoods and well-being and positive outcomes for biodiversity and climate. Overcoming dualism, separation, and imbalances in relationships between humans and nature is central to addressing the biodiversity and health crises, including the rise of zoonotic diseases and pandemics. Sustained interactions and partnerships between sciences and indigenous and local knowledge systems are enriching contemporary problem-solving with holism and reciprocity.⁸

Land rights as foundation for nature-based solutions

Empirical evidence abounds that support the assertion that securing IP rights to their lands, territories and resources can conserve and restore our most vulnerable ecosystems, increase the storage of carbon, scale out agroecosystems for sustainable food production, and restore harmony with nature and all life forms.

“Indigenous Peoples and local communities customarily manage over 50% of the global land mass, but legally own just 10%, rendering them and their lands vulnerable to the economic pressures that drive land use and land cover changes worldwide. Scaling up efforts to close this gap and secure community land rights represents the world’s single greatest opportunity to simultaneously increase carbon stores, restore degraded land, reduce emissions, improve food security, diminish the likelihood of conflict, and enhance ecosystem resilience on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.”⁹ In addition, current estimates show that communities steward at least 22% of the forest carbon found in tropical and subtropical countries. A third of this carbon lies in forestlands where Indigenous peoples and local communities lack legal recognition of their tenure rights. Further, IPLCs rely on collective tenure arrangements to support their livelihoods. Indigenous peoples’ land rights are not only unrecognized but their lands and waters and the biodiversity that they contain are under direct threats from industrial-scale development and illegal incursions (LBO-II p.12).

Land tenure insecurity negatively impacts efforts towards sustainable management and restoration of ecosystems essential to realizing climate and sustainable development goals. Security of land tenure underpins the ability of Indigenous peoples to exercise self-governance, adapt to their changing environment, and steward the ecosystems they depend on by incentivizing maintenance and restoration and by mediating the risk of conflict and illegal appropriation by others. Securing community land rights is therefore vital to meeting the goals of the Paris Agreement, the 2030 Sustainable Development Agenda, global biodiversity, and conservation targets.

Despite irrefutable evidence of the link between legal recognition of collective land tenure rights for indigenous, local communities and Afrodescendant peoples and much lower deforestation rates than other protected and unprotected areas, only less than 20% of these customary lands are under formal legal ownership (RRI 2020).

Framing of nature-based solutions as a new invention

Prevailing notions and discourses of NBS are presented as “new” climate solutions that place primacy on carbon as a commodity. These narratives ignore the fact that nature-based solutions are the daily rhythm and practice of Indigenous peoples’ livelihood production systems. This reality is reflected in the prevailing trends in which areas of highest biodiversity concentration in the world corresponds with Indigenous peoples’ territories. Despite these realities, little support from states and other non-state actors has gone towards Indigenous peoples, and fear abounds that the new narrative if unchallenged and nuanced to recognize IPs’ rights and contribution would perpetuate the present similar negative outcomes.

INDIGENOUS PEOPLES’ EXPERIENCES ON NBS: A PASTORALISTS PERSPECTIVE

People groups who self-identify with the Indigenous peoples’ movement in Kenya are mainly pastoralists and hunter-gatherers’ communities. Pastoralists comprise approximately 25% (12 million) of the national population while forest hunter-gatherers’ communities are not more than 200,000. Pastoralists mostly occupy the arid and semi-arid lands in northern Kenya and towards the border of Kenya and Tanzania in the south. The hunter-gatherer groups are generally found in the forested areas of the central Rift Valley province in the western part of the country with a few other groups dispersed in the southern coastal areas of the country. This paper sought to generate lessons on nature-based solutions from the pastoralist Maasai communities in Kenya.

The Maasai of East Africa live in the southern part of the Republic of Kenya and in northern Tanzania, occupying large semi-arid and arid areas characterized by low and unreliable rainfall and limited permanent sources of surface water. The Maa speaking people group are broadly organized into 16 political territorial sections¹⁰ (*Olosho*, singular; *Iloshon*, plural). All the sections share a common (albeit distant) ancestry, language, and cultural heritage. Each Maasai section is associated with a generally acknowledged geographical territory over which they are settled and control and manage the land and natural resources.

They keep cattle, goats, and sheep which they move seasonally to optimize the utilization of rangeland resources for maximum meat and milk production. The strategy of mobile grazing allows their animals to utilize a wide variety of forage vegetation types that are widely dispersed. This increases seasonal grazing and the carrying capacity of the land. As a result of well-skirted livestock movement, the herds stay healthy and produce a reliable supply of milk and meat that meets the demands of polygamous pastoral households.

Although over the years the Maasai have undergone great changes in structure and organization, they are a unique ethnic group least influenced by the Western ideologies of modernity and “civilization.” Despite the enormous pressure for change, the community has managed to maintain its cultural and ethnic identity to a large extent—the Maa language, traditional mode of dressing, belief and value system and customary institutions—often making it one of the key

attractions for cultural tourism and ethnography studies, and indigenous knowledge systems and practices-informed research studies in the country such as herbal medicine, indigenous food systems, traditional governance, conservation and natural resources management.

Pastoral landscapes: harsh climate and rangelands in disequilibrium

Like the story of most Indigenous peoples of the world, historically the East African Maasai was pushed away from more productive territories to the remotest and most harsh geographical landscapes in the region by colonial forces. The colonial encounter and the subsequent Anglo-Maasai “treaties” of 1904/1911 resulted in the Maasai being pushed from the highlands of the rift valley to the southern, much drier, and semi-arid Counties of Narok and Kajiado along the Kenya- Tanzania border. These environments are continually changing with need for high adaptability and resilience being central to survival.

At least 75% of the total land area in Kenya is classified as arid and semi-arid lands (ASALs) which comprise savanna and grassland ecosystems traditionally used for pastoral purposes. Woodlands, bushlands, and grasslands cover approximately 40 million hectares of land in Kenya and constitute significant carbon sink.¹¹

The defining feature of the ASALs is their aridity. Annual rainfall in arid areas ranges between 150mm and 550mm per year, and in semi-arid areas between 550mm and 850mm per year. Temperatures in arid areas are high throughout the year, with high rates of evapotranspiration. Pastoralism relies on the availability of water, pastures and labor to thrive - with water as the determining factor.

Drought and famine are one of the main environmental threats intermittently experienced by pastoralists in the country. Environmental shocks and stresses brought about by droughts compound poverty and affect the poor disproportionately because the poor are found in marginal and vulnerable areas. Loss of livestock and wildlife as well as displacement of communities in search of water and pasture further worsen the quality of life for the local communities. Adverse changes in the weather patterns have resulted in reduced diversification opportunities in agro-pastoralism.

In addition to climatic and weather-related pressures, external political and social pressure particularly with respect to land and natural resources ownership, control and use approaches, is equally enormous. For years, policy makers in the country have argued that mobile pastoralism as a livelihood strategy in drylands was irrational and environmentally destructive, ultimately contributing little to the national economy. Because of these historical, environmental, ecological, and political negative pressures, ASALs in the country exhibit the lowest development indicators and the highest incidence of poverty in the country.¹²

Contrary to this long-held belief, recent research estimates the contribution of livestock to agricultural GDP to be at least Kshs. 320 billion, only slightly less than that from crops and horticulture. The ASALs are home to about 14 million people and approximately 70% of the national livestock herd. Livestock production accounts for about 30% of total national agricultural production and 75% of wildlife are in the ASALs (GoK, 2005).¹³

The bulk of the meat, milk and other livestock products consumed in the Horn of Africa region comes from the drylands (Kirkbride and Grahn, 2008). The contribution of the livestock sector to national income across the region is underestimated. National accounts do not capture the value of these enormous herds to people in the drylands. They provide most of the subsistence needs of dryland people – at least some 14m in the drylands of Kenya (GoK, 2007) alone.

Drylands ecosystems are not only valuable in wildlife conservation, tourism and livestock keeping but equally in maintaining soil fertility, holding and maintaining water and air quality and in carbon sequestration. Pastoralism is therefore key to the maintenance of these vital dryland ecosystem goods and services.¹⁴ In order to exploit carbon sequestration opportunities, the carbon sink capacity of drylands needs to be rehabilitated in some areas and preserved in others.¹⁵

Given the climate-sensitive landscapes that pastoralists find themselves in, the question how they have managed to sustain life in such difficult circumstances begs some answers. Climate continues to seriously aggravate the impacts of current challenges in the drylands. Of all the natural resource-based land uses in the drylands, pastoralism functions better within the context of wide rainfall variability and unpredictability. It therefore presents a more logical adaptation route than livelihood activities and land use which do not have the advantage of mobility.

Nature-based solutions: Pastoralists' strategies, approaches and associated benefits

a. Strategies and Approaches

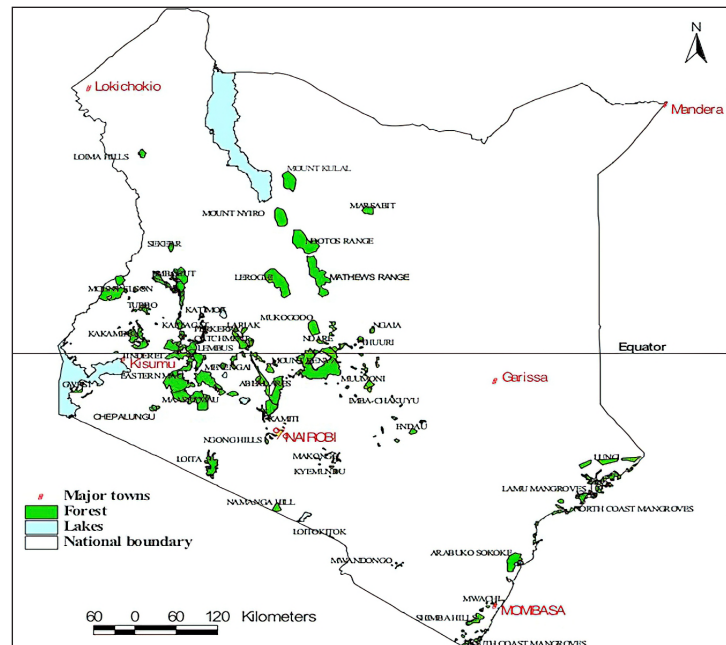
Natural resource management: Indigenous territories strongly overlap with areas of highest biodiversity concentration in the country. To begin with, over 75% of wildlife exists outside of national parks and protected area boundaries, and 92% of the country's protected areas fall within indigenous pastoral territories.¹⁶ In addition, across Kenya's arid and semi-arid lands, vast rangelands are being transformed into community conservancies - common property arrangements managed for transhumance pastoralism and biodiversity conservation. By 2019, a total of 160 conservancies, 11 regional associations were in operation on conservation in community and private land spread within 28 of the 47 Counties in Kenya and covering about 11% (6.5 million ha) of the country's land mass. Forty percent of Africa's large mammals, for example, can be found in the Greater Mara Ecosystem. This ecosystem also contains 30% of what is left of Kenya's wildlife.¹⁷

The story is the same for forestry resources. Based on FAO data, in 2010 of the three forest tenure regimes in the country (public, private and communal), community ownership constituted the largest forest tenure system - encompassing approximately 58% of the country's forest area, most of which is found in Indigenous peoples' territories.¹⁸

That forests and areas of highest biodiversity conservation coincides with areas occupied by indigenous pastoralists communities is not accidental. It is the positive people-nature relation and grazing effects of pastoral livestock, which has contributed to the maintenance of significant levels of plant as well as animal biodiversity on these landscapes (Homewood, 2008). Pastoral-

ism has contributed to the evolution of the many rangeland habitats that support wildlife-based tourism in the country through their indigenous knowledge systems and practices.

Indigenous knowledge accumulated intergenerationally is translated into a rich and deep pastoral bio-cultural seasonal calendar which reflects seasonality of the landscapes, prevailing land use practices and associated social-cultural practices. The seasonal calendar then informs land use practices, which include zoning of land to include, for example, *endukuya oo nkishu* (livestock grazing front), *olokeri* (family pasture reserve for sick and weakly animals), *emboliei* (saltlicks sites) and access routes to water (*enkoitoi enkare, ilangát*), among other land use strategies.



Distribution of Public Forest (KFS 2015)

On a larger scale, land use within the respective Maasai Territorial Sections is categorized into *Osupuko/Isupuki* (highlands) and *Olpurkel/Ilpurkeli* (savannah lowlands/rangelands). *Olpurkel* is utilized for livestock grazing during the wet seasons - when water and pasture are abundantly available - while *Osupuko* serves as dry season grazing reserve. The established land use regimes are then monitored and enforced through social norms and sanctions. Subsequently, most of the conflicts experienced by the community arise from deviation from traditionally agreed norms related to management of cattle, land and natural resources and social relations. These communities have accumulated indigenous knowledge about their natural resource base, which has enabled them to survive the often harsh environmental conditions (Barrow, 1990).

Community based monitoring information systems: The connection between the people and nature transcends all social divisions of gender, age and other social stratifications within the society. Men and women, the old and the young alike are connected to nature in unique ways in their daily livelihoods' activities. Elders order warriors to conduct ecological scouting (*Eleen*), which includes identifying and classifying plants and accurately assessing the water-holding capacity of distant pastures. Then they draw up movement itineraries based on the warriors' reports, elders' experience, and collective social memory. Nature and all its provisioning services are at the center of the Maasai social and cultural identity evidenced by the fact that all rites of passage from birth to death utilize some aspects of the forests/plants.

The 'reading' of stars and goats' intestines in weather forecasting, for example, is a specialized skill held by a few indigenous knowledge experts, while observations related to animal behavior and plant phenology is knowledge accessible to most members of the community. Monitoring and observation of weather forecasting indicators is a collective affair embedded in individual's

and community's traditional livelihoods and occupations. Specifically, *Ilaleenok* (Assessors/monitors) undertake (eleen) monitoring missions to assess trends in abundance of pasture, saltlicks, water and disease incidence to inform livestock mobility.

Broadly, climate and weather related data generation and monitoring encompasses i) astronomical observations including appearance and relative position of the sun, moon and stars; ii) biophysical observations such as 'reading' of goats' intestines; iii) observation of plants' attributes such as morphological and physiological responses to events in which leaf color, flowering/bloom/blossoms, fruiting, specific plant/tree species are observed; iv) Animals' behavior - both domestic and wildlife - including birds and insects; v) clouds' formation, patterns, relative location and intensity are equally observed, monitored and interpretation done to inform subsequent actions.

As most travels within the local community are by foot, significant observation and reporting of landscape-based indicators is undertaken by *Ilapuayak/Ilomon* (travelers). The reporting is done at the traveler's subsequent stop(s) through *Ilomon* (news/exchange of information). The centrality of travelers in monitoring and reporting weather forecasting related indicators is underscored by the fact that the word 'ilomon' in the Maa language means both 'guests/visitors' and or information/news – making the sharing of information obligatory.

Herders - boys, girls, men and women - are expected to monitor the ecosystems daily as they undertake their respective daily livelihoods' activities - grazing, fetching firewood and water, gathering edible wild fruits and root tubers and wild honey. Traditional medicine men/women specifically monitor tree and plant species of medicinal value. Specifically, women monitor trends in abundance, scarcity and quality of water sources for domestic use and indigenous medicinal plant species relevant for children's use. The community's elders and experts in the reading of stars and goats' intestines then help in putting the indicators collected in perspectives based on historical trends and community's collective memory.

The information generated and the associated interpreted weather trends are disseminated as *ilomon* (sharing of news) or *ilkushin* (official community meetings) within *olmarei* (families), *elatia* (neighborhood), *olosh*o (the larger community). Sharing and dissemination of the generated information is also effected through songs (e.g. *eoko* for men), rituals, ceremonies and apprentices.

In terms of application, the knowledge integrates a landscape-based approach geared towards achieving an ecological equilibrium responsive to people, livelihoods and climate concerns through highly adaptive and resilient practices. Indigenous knowledge is therefore practical and highly adaptive. The indicators observed, generated and interpreted over time often coalesce into a seasonal bio-cultural calendar, strongly associated with the community's cultural identity, indigenous rites of passage, spirituality and climate change adaptation strategies such as livestock and people's mobility.

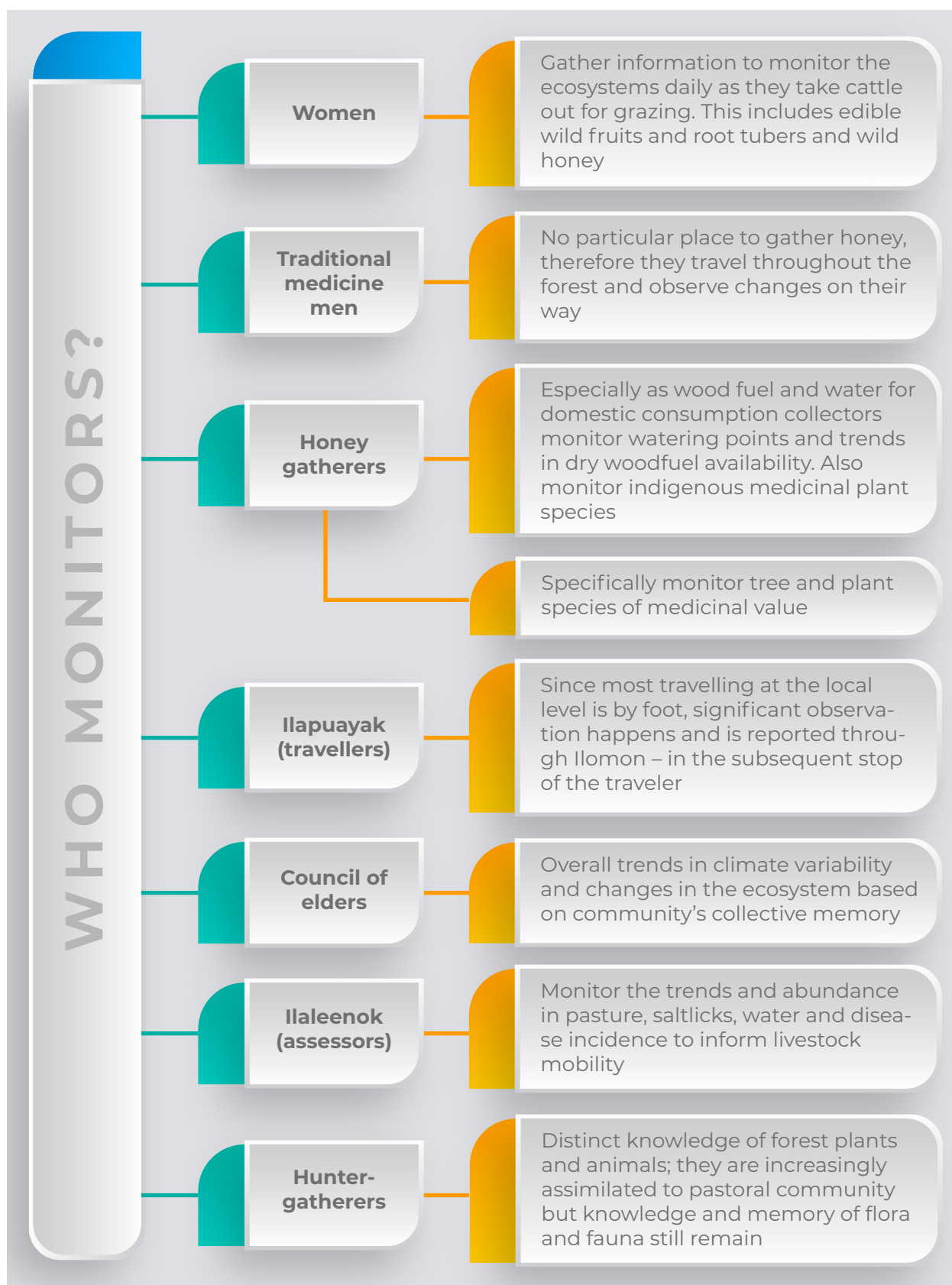
The knowledge is informed by a wide array of weather indicators (associated with clouds, cosmic bodies, flora and fauna) observed and interpreted across generations which are applied in combination with each other to arrive at more reliable (triangulation of data) and conclusive weather seasons and trends. Overall, some of the indicators are locally interpreted and applied, while others are applicable at larger scales and landscapes. The knowledge is more reliable in predicting short-term expression of weather conditions (0-12 months).

The community monitors a range of natural resources, including trends in rainfall periodicity, intensity and extent; trends in abundance or scarcity of flora, fauna; trends in land-use changes - state of sacred sites, caves for meat-eating camps; trends in water abundance and quality; trends in incidence and intensity of pests and diseases; trends in abundance or scarcity of medicinal tree/plant species; trends in abundance or scarcity of pasture, incidence of invasive species; and trends in abundance or scarcity of wild honey, among others.

In a nutshell, community-based monitoring information system entails *Ilomon* (the daily continuous sharing of news), *Ilkiushin* (official traditional deliberative meetings over emerging issues of concern) reported to Council of Elders, *Oloiboni* (spiritual leader and seer) and regulated through customary law founded on indigenous value systems, norms and practices. Monitoring of the ecosystem is a lifestyle for Indigenous peoples, not an activity, deeply embedded in their cultural, spiritual, and economic dimensions. CBMIS is still vibrant, elaborate and robust despite the numerous external pressures.

Indigenous communities' ground-level generated data is useful both for monitoring on the ground and for feeding into national and global assessment processes. Global platforms relevant for these data include Local Biodiversity Outlooks (LBO) reports and International Panel on Biodiversity and Ecosystem Services (IPBES), both of which are associated with the CBD mechanism, the Local Communities and Indigenous Peoples Knowledge Platform (LCIP) under the UNFCCC, and a number of Advisory platforms within several natural resource related multilateral processes. The following diagram summarizes the role of different actors in the monitoring of nature in the context of pastoral Maasai community:

The land management strategies traditionally employed by mobile pastoralists have been recognized as one of the most effective means of restoring ecosystem health and reversing degradation in drylands. Evidence abounds to the effect that communal land tenure is the most viable tenure system well suited to areas of climatic variability. Yet, pastoral land continues to be annexed for uses, which are perceived as more productive, such as conservation, commercial agriculture, ranching and tourism.¹⁹ Areas selected for annexation and appropriation are invariably the better and more strategic lands, such as wetlands and forests.



NATURE-BASED SOLUTIONS: THE LIFELINE OF TRADITIONAL OCCUPATIONS AND BASIC SURVIVAL OF MAASAI PASTORALISTS

This section of the paper gives a brief overview of how nature-based solutions permeate all facets of the indigenous Maasai existence.

Due to the harsh environmental conditions often experienced in Maasai land, nature including trees, shrubs and pastures plays an important role in the Maasai livelihood systems. Through their intimate association with and dependence on nature, Maasai pastoralists have accumulated extensive knowledge about the landscape and the flora and fauna on it. They can for example describe a wide range of plants' seasonality, nutritional value, toxicity, and medicinal properties for both humans and the different animals they keep. As herders, the Maasai know all the grasses on the range. Maasai distinguish between those plants that are good for increasing milk and those that fatten livestock and improve their condition. This knowledge is particularly important during exceptionally dry years when decisions must be made about where to graze, which grasses recover faster than others and, based on the availability of resources, what stock should be culled first. Nature is therefore their main source of food, fodder, medicine, and construction materials while assisting in the maintenance of catchments, soil fertility, and soil protection. Nature also plays a symbolic and ritual function.²⁰

Access to pasture, water, saltlicks and avoidance of disease incidence-prone areas are carefully regulated and socially enforced. The approach to pasture conservation and rotational grazing is openly discussed and strategies approved through consensus. Under customary tenure the pastoralist grazing range often corresponds to closely related villages or clans, granting them limited and differentiated rights of access. In instances where pastoralists live near the forests (such as the Loita Maasai of Naiminie Enkiyo forest in southern Kenya), the forest only serves as grazing area during the dry season, thereby serving as an important source of security/'grass bank'.

Livestock and pasture management: At least 75% of the cattle herd in Kenya is made up of indigenous breeds, which are traditionally kept by pastoralists in the drylands. Maasai pastoralists have evolved a well managed system of livestock management to ensure a continuous supply of livestock forage throughout the year. Some of the coping strategies employed in managing pastoral herd and pasture in the context of climate variability include:

- Use of rotational grazing on large diverse rangelands where wet and dry season grazing areas exist. Natural resources are managed through *common property regimes* where access to pastures and water is negotiated and dependent on flexible and reciprocal arrangements. Mobility remains the most important pastoralist adaptation to spatial and temporal variations in rainfall. Mobility allows pastoralists to respond quickly to fluctuations in resource availability and thereby maintain their herds and other assets as well as their productivity. In drought years many communities make use of fallback grazing areas unused in "normal" dry seasons because of distance, land tenure constraints, animal disease problems, or conflict. Pastoralists therefore thrive on variability in the context of harsh and volatile climate.

- Pastoralists engage in *herd accumulation*, and most evidence now suggests that this is a rational form of insurance against drought. Complemented with increasing systematic selling of livestock during drought or drought-onset,²¹ Maasai pastoralists *keep multispecies herds* (composed mainly of indigenous livestock breeds [cattle, sheep, goats and donkeys]) to take advantage of different ecological niches and the labor of men, women, and children. Shifts in the balance of species can occur as responses to climate variability and changes in the environment, market conditions, and availability of labor.
- Use of *tree fodder during the dry season*. Pastoralists also use supplementary feed for livestock. This is either purchased or lopped from trees as a coping strategy. Kiptot (2007) reported at least 154 indigenous species of fodder trees utilized during special circumstances e.g., for sick or lactating animals or extreme drought.
- Use during critical periods of set-aside land and fenced-off land in communal areas for grazing reserves, known as *olokeri/olopololi*, often reserved for young calves unable to walk long distances to graze, sick animals (to be cared for and kept isolated from other animals, thus controlling the spread of disease), and a few lactating animals, especially in times of critical grass shortage. They use several *intra community mechanisms* to distribute livestock products and spread risks during time of drought and incidences of diseases. They intensify animal disease management through indigenous and scientific techniques, and they increasingly pay for water from powered boreholes.

Animal disease control and management: The pastoralists' community also practices an ecological approach to disease prevention and control. The community conducts transhumant intra-annual and inter-annual livestock movements, not only in search of forage and water but also to carry out organized skirting of the ecology of the area. In this way, they can avoid grazing areas where wild animals might prey on the herd or where there may be at risk of disease. This may come from contact with other sick herds or from disease-bearing pests. Swampy floodplains for example provide a habitat for disease-bearing flies, vector snails and economically destructive liver flukes (Olchutai). Other grazing areas and certain types of trees are known to harbor ticks and Tsetse flies (Olkimpai), which transmit fatal blood parasites. Other notorious infectious livestock diseases for which there is no known medical cure yet, besides nature-based strategies from pastoralists, include Malignant Catarrhal Fever (MCF), *linkati* (named after the wildebeest which serves as an intermediary host for the disease-causing agent) and foot and mouth disease (FMD).

Food and nutrition provisioning: Maasai diet-related ethnobotany and intake patterns are another front in which nature-based solutions is a day-to-day reality.²² Traditionally, the Maasai rely on meat, milk, soup and blood from cattle for protein and energy needs. Wild plant food, primarily fruit and roots and honey as well as medicinal plants, added to the diet and provided an important but understudied contribution to diet and health. Herbs were added in the stated mainstream Maasai food for flavor and/or for nutrition and medical functions. Wild fruits and roots provide a significant source of micronutrients during their months of availability. Overall, pastoral Maasai practice and enhance their food and nutrition security through sustainable use of environmental resources including water and adopting nutritionally and culturally appropriate use of purchased foods, on a subsistence level.²³

Ethno-veterinary knowledge and its application: **Pastoralists** rely heavily on their ethno-veterinary knowledge to treat worm infestation and cough among their livestock. The Maasai refer to trees and shrubs collectively as *olchani* (plural ilkeek), which would include tree, medicine and/wood. The complex agro-ecological system of pastoral areas and the pastoralists' extensive indigenous knowledge about individual tree species, their characteristics, management, and ultimate informed utilization are noteworthy. According to Kiptot 2007, pastoralists exhibited deep knowledge of nature as reflected, for example, in their ability to clearly distinguish the different parts of trees for particular use, including differentiating the parts of the trees - bark, roots and/or leaves - that have the desired medicinal value and effects. Appreciating the value of succulence and big broad leaves as supplementary source of water and fodder availability in the context of mostly dry environments, accounting for harmful effects of fodder, and attributing fodder palatability to leaf texture, fodder maturity, and taste of fodder are other areas in which Maasai pastoral knowledge of nature and its value is exhibited.

Human indigenous herbal medicine: Traditional medicine is widely used among the Maasai. Traditionally, herbal mixtures were used to aid digestion and/or as excitants, particularly by *ilmurran* (warriors) preparing for raids. Herbs, bark and roots which were boiled in soup that was drunk in order to improve immunity is practiced even today. This indigenous approach to dealing with disease conditions and promoting overall well-being in the context of health was recently reignited in response to the COVID-19 pandemic. Nevertheless, the survival and development of Maasai herbal medicine will depend on whether plant biodiversity is preserved.

Domestic energy sources: Firewood is the main source for energy for most pastoral Maasai households of Southern Kenya. The task of gathering firewood is often allotted to women who collect the firewood from the most convenient places, normally the nearest, and from areas where the specific species of interest, mainly where *oloirien* (wild olive, *Olea africana* ssp. *Europaea*) is aplenty in dry form. For each community or village, there are specific areas for firewood collection where most women go. According to Maundu et al (2001), when firewood from this particular tree is used by a woman, she is traditionally believed to endear herself to her husband. A great variety of species can be used as firewood but whatever their species, it must always be *dry or dead wood*.²⁴

Water catchment and sources: Pastoralists' water requirements are high, and people experience considerable hardship in travelling long distances to look for water for both human and livestock consumption. Watering points belong to the whole community. Water points are protected, and their access regulated by elders. Specific points are identified and set aside for livestock watering and others for domestic water harvesting. Women in particular play a key role in monitoring water levels and quality for sources of water dedicated for domestic consumption, while their male counterparts do the same for livestock watering points. Ensuring regular supply and controlled access/use of water for livestock is essential in the context of pastoralism because it influences availability and effective utilization of pastureland.

Forest as source of local construction materials: Most of the Indigenous peoples' structures that may require use of forest resources are often simple in nature and make use of mostly dry wood and twigs. A Maasai traditional house is a simple structure made up entirely of wooden poles and interwoven twigs/ branches and smeared/cemented with cow dung. Specific species

are preferred for the different parts of the building. The fence around the homestead and animal enclosure also uses branches of thorny bushes, rarely tree trunks. Wood for such constructions is freely sourced from any part of the forest without having to obtain permission from official entities. Extraction of large quantities, especially of specific species, is however under strict control of the elders. Among the Loita Maasai, for example, the *Oloiboini kitok* (Chief Seer) plays a key role in decision making regarding the extraction of large quantities (Maundu et al, 2001). In the context of the Loita Maasai, the Oloiboini serves as the spiritual guardian of the forest.

Nature-based solutions in cultural identity, heritage, and spirituality

Nature in cultural and ceremonial expressions: The indigenous Maasai culture and social organization reflects rich and diversified customary systems and practices characterized by numerous ceremonies and rituals. In almost all these ceremonies and rituals, nature, specific species of plants/trees in the forest, and parts of trees and/or plants play essential roles. These ceremonies include those associated with significant life cycle events such as the rites of passage—naming, circumcision, marriage, and death—and are also held to fight disease, combat infertility, make requests for blessings and settle disputes. Maundu et al (2001) identified a total of 24 species of plants used by the Loita Maasai during various ceremonies and rituals.

The Oloiboni or spiritual leader, for example, uses a variety of plants to make charms for foretelling the future, cursing, bewitching, or treating people. Most of the traditional ceremonies associated with the rites of passage are preceded by the brewing of large quantities of beer. The gourds (*emala*) in which the traditional beer (*enaisho*) is brewed, the substance (*osuguroi*) used to accelerate the fermentation process, and the honey all come from the forest and associated products. The beer is also served in smaller gourds (*endukuny*), from which several people may drink. All members of the society participate in these ceremonies with each gender playing specific assigned roles.

Sacred sites: The forest has considerable spiritual and emotional value and thus many rites of passage and other important rituals and ceremonies take place here. Examples of these are the women blessing ceremonies and inauguration of *Olorrip olassar*, two important Maasai cultural practices. The women's fertility blessings ceremony is done for women who are unable to give birth or are barren. For men, the forest is the source of white chalk used by warriors, soil used during circumcision ceremonies, and the *Esonkoyo* and *Oleleishwa* plants used as perfume and deodorants.

Construction of a ceremonial warrior settlement (*emanyata oo-Imurran*)²⁵ is one other key area in which various types of trees and plants from the forest are used. This ceremonial temporal settlement marks milestones in the life of men as they progress in life within the age-set system to elderhood (Maundu et. al (2001).

GENDERED ASPECTS OF NATURE-BASED SOLUTIONS – THE PLACE OF WOMEN

Pastoral households divide their members into groups (boys and girls over the age of 10, women, warriors, etc.) and each group herd different classes of livestock in such a way that it is compatible with the composition and functions of the pastoral household economy.

Women are not passive players in this whole question of environmental and natural resource management and utilization. As resource users, caretakers of the sick members of the households, traditional birth attendants (TBAs) and participants (directly or indirectly) in all indigenous cultural and ceremonial practices within the community, women remain right in the center of these discourses and practices as well as being indigenous knowledge generators, holders, practitioners, and as immediate victims of negative impacts of environmental changes and of flawed development approaches undertaken within their territories.

In the context of the Maasai, women are known to be involved in harvesting traditional herbal medicines, especially as traditional birth attendants, mothers taking care of their young ones, and traditional medicine healers (*Enkaiyukoni*) treating several ailments using herbs from the forest. Furthermore, during certain rites of passage such as *Naming ceremonies*, women are assigned specific roles of fetching branches of the tree species to be used in this ceremony (*Ilatimi*). Through the women fertility ceremonies (*Emayian oo nkituaak*), which are conducted in sacred sites in the forest and make use of several tree species, an essential connection is made between women and nature. During this ceremony women perceived to be barren receive prayers and blessings from the elders for fertility.

Women's role as day-to-day caretakers of households, e.g. food preparation and general hygiene provision, brings them to closer interaction with the forests more than their male counterparts. As they fetch water, firewood, plants for medicinal and ceremonial uses, women come to develop and appreciate the critical value of nature in local indigenous livelihoods. As these services become increasingly scarce and further away from the original human settlements, women are not only the first to notice but often shoulder the heaviest burden. These special roles they play -- indigenous knowledge holders and immediate victims of negative environmental changes -- are rarely recognized and least of all, addressed.

Although from face value women seem to have little role to play in the public arena especially with regards to decision making over use and access of natural resources, this is not to say they are entirely locked out. Often, when elders hit a deadlock in public decision making, the phrase "*kalo maaiguanaki olchoni*" (the bed will help me decide) is invoked. It turned out women often contributed to decision making processes indirectly through a male figure - their husbands, father, sons and/or male friend -- despite the decisions attributed to the male figure.

NATURE-BASED SOLUTIONS: THREATS AND PRESSURES IN THE PASTORALIST CONTEXT

The Indigenous pastoralists' highly adaptive traditional production system is experiencing mounting pressures from encroachment on and individuation of communal grazing lands, constraining carrying capacity of the environment for livestock, disregard for indigenous knowledge systems and practices, and the desire to settle to access human services and food aid. Other emerging challenges include a push towards dependence on purchased foods, drought induced food crises, and dependence on food relief.

Dissolving the Pastoral Commons: fragmentation, privatization, fencing and sale of land

The foremost noted challenge relates to the building pressure towards privatization and individuation of the pastoral collective land tenure system. Evidently, collective land tenure arrangement, managed through customary law, is central to optimal and sustainable practice of nature-based solutions in the context of pastoral societies. Sustained intensification of fragmentation, privatization, commoditization and sale of hitherto open, extensive and flexible rangelands has led to dissolution of the pastoral commons, emergence of enclosures, constrained mobility, shrinking resource base, overuse, degradation, land insecurity, and conflicts within pastoral landscapes in Kenya.

Land tenure arrangement is strongly linked to community strategies towards livelihoods resilience in the context of climate vulnerability. For a long time, pastoralists in the country practiced semi-nomadic pastoralism on land that was *communally owned*. However, in the southern rangelands, changes in land tenure policies and practice have favored land privatization and fragmentation of former communal holdings, leading to increased land sales that have encouraged immigration of agricultural communities especially to the relatively high potential areas. These changes also have had the effect of increasing the risk of conflict when drought hits, given that it makes dwindling resources scarcer still and interferes with pastoral migration routes. Furthermore, pastoralists inhabit borderlands and cross into neighboring countries as part of their traditional migration, meaning that the relevance of state borders becomes somewhat blurred.

The overall negative impact of land tenure insecurity and fragmentation is the eventual weakening of social sanctions based on customary law that have been instrumental in sustainable natural resource conservation, utilization and monitoring.

In addition, sedentarization and urbanization continue to expand from the center, and pastoral grazing lands are increasingly compressed. The increasing sedentarization of the community reduces mobile pastoralism and exerts intense pressure on forage resources in the environs of the surrounding areas.



Fencing is another common phenomenon associated with land fragmentation and privatization, which has brought to a sharp focus critical issues relating to connectivity of pastoral grazing and conservation areas, including how human activity is affecting the migration and habitat of wild-life and strategic utilization of rangelands resources. While fences are useful in keeping intruders out or keep people and livestock in, it presents numerous challenges in respect to approaches to nature-based solutions. Consequently, there is notable behavioral change of migratory species, changes in soil structure and disruption of grazing patterns, and increase in incidences of direct and indirect mortalities related to fencing.²⁶

Another pressure point on pastoral lands is around *charcoal burning and market-oriented wood fuel harvesting*. Biomass (wood and charcoal) remains the primary energy supply used across all energy strata in the country.²⁷ Many households heavily rely on wood fuel for energy. Charcoal production is now one of the most pressing environmental problems experienced in the arid and semi-arid Lands. Kenya's charcoal production is a threat to the environment as over 99% still use inefficient - hence unsustainable - carbonization processes, as the traditional earth kiln has a low efficiency in the range of 10-13%. Hence, greater percentage of wood is wasted, with the resultant charcoal quality being low.



Left: Harvesting of wood for charcoal in the rangelands. Right: clearing sections of Maasai Mau for farming and human settlement

Other significant underlying drivers of land use change and food insecurity in pastoral landscapes include: economic development, mega-infrastructural development, natural population growth, low soil fertility, pests and diseases, low quality of agricultural input, poor markets and climate change including drought and floods. The different land use types ranging from large-scale wheat and maize production, subsistence agriculture, agropastoralism and wildlife conservation have induced a heterogeneous set of associated environmental challenges.²⁸

Misconception and unappreciation of the value and contribution of indigenous knowledge systems in NBS

Pastoralists make detailed observations in changes of short- and long-term climate variability. Intergenerationally, resilience is engrained within their cultures, traditions and practices. Indigenous knowledge systems and practices are therefore the foundation upon which nature-based solutions for Indigenous peoples is grounded. Indigenous peoples' knowledge systems are nature-based and honor the complex interdependence of all life forms. This fact explains the relative success for the sustainable management of their resources, including waters, rivers, oceans, peatlands, forests, deserts, prairies, and savannas, ultimately developing effective solutions and practices for biodiversity conservation and climate change adaptation and mitigation.

Indigenous knowledge refers to knowledge and know-how that have been accumulated across generations and which guide human societies in their innumerable interactions with their surrounding environment. It is generated through learning-by-doing, observations through exposure sensitivity, experimenting, and knowledge building (Berkes, 2012).

Indigenous ways of knowing and associated practices are often misunderstood, perceived to be a static set of information handed down with little change from one generation to another, ultimately disregarded and devalued by policymakers and development practitioners. The Maasai pastoralists case study demonstrates that this knowledge and associated practices are dynamic, with successive generations assessing and adapting 'old' knowledge to accumulate and create new knowledge. It is therefore continually called into question and accordingly refreshed.²⁹ Among Indigenous peoples, knowledge is a shared system that is collectively reshaped, enriched and exchanged by a web of social actors.³⁰

The knowledge is generated through observations by and experiences of members of the community within specific ecosystems (mostly savannah rangelands in the case of pastoralists), hence it is ecological zone-specific. Knowledge-holding is both collective/communal as well as individualized/specialized and intergenerational.

Minimal to no support for Indigenous Peoples' nature-based practices

Less than 3% of public funding for climate action goes to financing for natural climate solutions. In the past decade, less than 1% of global official climate funding was directed at Indigenous peoples, Afro-descendant peoples and local communities' tenure and forest management and less than 1/10 of that 1% was directed towards just securing land tenure rights.

NATURE-BASED SOLUTIONS: POLICY, LEGISLATION, AND PRACTICE IN KENYA

Nature-based solutions are influenced by a wide range of policies and legislation in Kenya. They include those related to land and natural resources such as mining, wildlife, water, forests, environmental conservation and management, climate change, and other associated sectoral policies.

Challenges arising out of policy and legal issues come in different forms and are expressed and felt at different levels. First is the extent to which the policies speak to each other to guarantee coherence. Second is the extent to which the policies are understood by both policy implementers and social actors operating in the policy space. Lack of information and understanding of the existing legal frameworks with respect to climate change and nature-based solutions, in addition to weak enforcement, has contributed significantly to poor understanding and promotion of NBS in the country.

Decision-making arrangements and institutional frameworks established to operationalize the legal and policy provisions and aspirations related to nature-based solutions are as important as the laws they endeavor to effect. Customary rights and pastoral social institutions are not recognized by law, and customary tenure systems operate in parallel with state institutions, which results in contradictory rules and competing authorities.

Increasingly, new policies and laws have been promulgated across levels to ensure the recognition, respect, protection, and fulfilment of Indigenous peoples' rights. Kenya has come a long way with respect to legal recognition of the peculiar state of indigenous communities in the country and has made significant progress in providing a legislative and policy framework to address their plight. What remains to be seen is the extent to which practice on the ground will be in tandem with the policy and legislative gains.

The Community Land Act 2016, for example, now vests community land in communities, giving them the power to enter contracts/leases with investors in consultation with the County governments. Full and effective consultation mechanism with community landowners is a requirement of this Act. Land tenure security is crucial in inspiring confidence and incentivizing landowners and managers to devote their time and capital to land improvement practices and reap the benefits.

Impacts of climate change within arid and semi-arid areas and the need for targeted affirmative interventions are clearly elaborated in Kenya's National Climate Change Action Plan (NCCAP)

2018-2022. The Climate Change Act 2016 recognizes indigenous knowledge and grants Indigenous peoples direct representation. The Protection of Traditional Knowledge and Cultural Expressions Act, 2016 has been adopted to guide government and other development actors in engaging with indigenous knowledge and associated cultural expressions. The country has developed National Free Prior Informed Consent (FPIC) Guidelines applicable whenever interventions are undertaken within Indigenous peoples' territories.

Nature-based solutions in Nationally Determined Contribution

The Paris Agreement aims to keep the increase in global average temperature to well below 2°C above pre-industrial levels and to reach global peaking of GHG emissions as soon as possible. Countries are expected to determine at the national level what actions they are willing and able to take to achieve this goal. Kenya signed the Paris Agreement on 22 April 2016.

Nationally Determined Contributions (NDCs) are national climate change action plans that detail plans to achieve GHG emission reduction targets and adaptation goals. Countries are expected to submit a new NDC every five years, and each NDC will represent an increase in ambition.³¹ The NDCs are meant to be ambitious leading to transformation in carbon-intensive sectors and industries, transparent to ensure clear monitoring of progress, clearly communicated and overall articulate how the country is integrating climate change into other national priorities, including SDGs. Interventions in the Forests sector including Reducing Emissions from Deforestation and Forest Degradation, plus the sustainable management of forests and the conservation and enhancement of forest carbon stocks (REDD+) and agriculture are ideally to be included in efforts to mitigate emissions within NDCs.

Kenya's mitigation NDC is aligned with the Country's National Climate Change Action Plan 2018-2022, which sets out a low climate development pathway that supports efforts towards the attainment of Vision 2030. Kenya's National Determined Contribution seeks to abate its GHG emissions by 30% by 2030 relative to the Business As Usual (BAU) scenario of 143 MtCO₂eq and in line with its sustainable development agenda. Forestry is expected to give significant contribution of about two-thirds of the country's 30% emission target.³² County Governments are required to integrate and mainstream climate change actions, interventions, and duties into the 5 yearly County Integrated Development Plans (CIDPs).

The stated goal of Kenya's National Policy on Carbon Investments and Emissions Trading (2011) is to develop a strong carbon market to benefit all people at all levels, reduce the country's over-dependence on foreign economic assistance, and guarantee resource mobilization for recapitalizing investments in the country. The policy also stops short of elaborating how the anticipated revenues from the carbon markets will be distributed in the country.

Carbon rights are linked to the property rights over land and forests in which the carbon is stored or use and management rights related to forests. However, the right to own or manage a forest does not necessarily confer a right to benefit from it. For example, REDD+ rules will include

social safeguards such as respect for the knowledge and rights of Indigenous peoples and may also promote other policy objectives, e.g. respect for human rights and democracy.³³

The actual asset - in this case the carbon asset - is owned and controlled by the right-holders. Carbon rights distribution can only be facilitated through offset issuance rules. Therefore, the rules for offset issuance have an impact on rights holders. The question of offset issuance is often lost in the benefit-sharing discussion. The value of carbon offsets can be a large part of the benefits received from sustainable forest management. The issue of who owns the carbon offsets and how they will be managed and distributed from the owner to the local stakeholders must be directly addressed when developing REDD+ program rules.³⁴

Nationalization and privatization of natural resources and associated payment for ecosystem services under the nature-based climate solutions, including REDD+, agriculture, LULUCF that are to be reported under Nationally Determined Contributions are potent serious entrenchment of historical exclusion, marginalization and violation of Indigenous peoples' rights. Adaptation-related NDCs within the National Adaptation Plan (NAP) must demonstrate the extent to which the said adaptation plans have contributed to enhanced resilience of indigenous communities to climate shocks including through disaster risk reduction strategies and early warning systems. These should be enabled through Indigenous peoples' sensitive indicators.

Indigenous Peoples' engagement in NBS Processes across levels – potential strategies

Policy and political strategic lobbying and advocacy across scales: Discussion, negotiations, planning and actions on nature-based solutions happen at multiple scales and spaces. Strategic organization, creative messaging, building solidarity and alliances, collaborative actions, and networking are essential ingredients in effectively influencing NBS related processes and outcomes by Indigenous peoples.

NBS related dialogues, visioning and actions happen at multilateral processes such as the United Nations Framework Convention on Climate Change, UN Convention on Biological Diversity, Sustainable Development Goals, UN Food and Agricultural Organization, Global Environmental Facility, Green Climate Fund, Intergovernmental Platform on Biodiversity and Ecosystem Services, among others.

These multilateral mechanisms have also developed Indigenous peoples' dedicated spaces of engagement such as the Local Communities and Indigenous Peoples Platform, Working Group on Article 8(j), Indigenous Peoples Advisory Group (IPAG) and United Nations Permanent Forum on Indigenous Issues (UNPFII) and the Expert Mechanism on Indigenous Peoples (EMRIP) within the UNFCCC, CBD, GCF, UN Human Rights Council, respectively.

Overtime, Indigenous peoples of the world have developed coordination and lobbying spaces and platforms at the international level such as the International Indigenous Peoples Forum on Climate Change (IIPFCC), International Indigenous Forum on Biodiversity (IIFB), Indigenous Peoples Major Group (IPMG), Indigenous Peoples Steering Committee, and Indigenous Peoples

Advocacy Team (IPAT) under the UNFCCC, CBD and IPBES, SDGs and Agenda 2030, FAO and the GCF, respectively.

Essential in efforts to enhance participation and influence of these global spaces and mechanisms is the need to increase and strengthen the number of Indigenous Peoples Organizations (including pastoralists organization) through accreditation with the relevant international frameworks. In addition, internal self-organizing across regions and scales (national, regional, and international) to enhance effective representations and internal self-accountability in the emerging Active Observer spaces is paramount. Support for IPs' coordination and participation in and through these critical platforms during negotiations sessions of the international mechanisms is critical. Efforts to enable dissemination/report back of outcomes of global processes/mechanisms back to IPs' home constituencies and countries should also be enhanced.

Policy development, planning, implementation, monitoring and reporting on NBS happens at the national, subnational and community levels. Land, natural resources, biodiversity, climate change and sustainable development related response measures, planning, actions and monitoring take place at the national level. The CBD framework processes such as the National Biodiversity Strategy and Action Plans (NBSAP), national regulations for Access to Benefit Sharing (ABS) under the Nagoya Protocol, Global and Local Biodiversity Outlook reporting have bearing on NBS.

Tapping and feeding into climate change planning, monitoring, and reporting frameworks such as the 5 yearly planning and reporting on Nationally Determined Contributions, National Forest Monitoring Systems (NFMS) and the place of Community-Based Monitoring Information Systems and REDD+ Related Processes, Readiness, Safeguards, and non-carbon benefits, all under the UNFCCC, provide opportunities for advancing Indigenous peoples' interests in NBS. Supporting IPs' sustained strategic engagement with the Local Community and Indigenous Peoples Knowledge Platform through enhanced support for generation, documentation and sharing of indigenous knowledge systems and practices, including creation of robust linkages with National Climate Change Action Plans, is another necessary action.

At the County level, integrating NBS approaches informed by indigenous pastoral knowledges and practices, values, and norms into County Integrated Development Plans and spatial land use planning will help generate bottom-up approaches in the promotion of NBS. The state and local authorities should pro-actively develop strategies aimed at reducing vulnerabilities and enhancing resiliency through improved land tenure security for Indigenous peoples, effective representation of Pastoralists in decision-making arrangements, capacity building and sustainable livelihoods diversification, e.g. pasture banking, beekeeping, livestock insurance and promotion of early warning systems, among other measures.

CONCLUSION AND PATHWAYS TO SUSTAINABLE PROMOTION AND APPLICATION OF NBS

Many Indigenous peoples and local communities live in ecosystems that are vulnerable to climate change and, therefore, are disproportionately impacted by the effects of climate change. Yet, IPLCs are on the frontlines safeguarding genetic diversity, species diversity and ecosystem diversity. A high proportion of ecosystems rich in biodiversity, including many threatened species, is governed under customary or community-based regimes.

The values, ways of life, knowledge, resource governance and management systems, economies and technologies of Indigenous peoples have much to offer towards addressing biodiversity and climate change challenges and towards reimagining the diverse global systems that can deliver shared visions of solidarity, NBS and of no one left behind.

Overall, a deliberate shift away from a sole focus on economic values towards diverse intrinsic, material, social, cultural and spiritual values across society is critical and urgent. A recognition that cultural and biological diversity are interdependent and that improved integration of diverse cultures and viewpoints into national and local development strategies and into planning, accounting and reporting processes results in better biodiversity and cultural outcomes, and sustained nature-based solutions is also critical and urgent as indicated in the Local Biodiversity Outlook Report II.

Enhancing and mainstreaming NBS within national governance, climate action and climate policy-related instruments, including Nationally Determined Contributions, Adaptation Communications, long-term low greenhouse gas emission development strategies, spatial planning, national development plans, business plans, is an essential ingredient in ensuring sustained application of NBS.

1. The foundational framework for sustainable nature-based solutions for Indigenous peoples is collective land ownership regulated within customary law and traditional institutions of decision making. Governments and other actors should support land tenure transitions towards securing customary land tenure - lands, waters, territories, and biodiversity - for Indigenous peoples. Indigenous peoples should strategize and sustain their lobbying and advocacy efforts on land rights claims.
2. Indigenous knowledge systems and practices founded on indigenous value systems, cultural heritage, and norms, reflected in positive people-nature relations and traditional occupation, is the heartbeat of NBS among Indigenous peoples. The practice, generation, application, and dissemination of these knowledge systems within IPs' territories is threatened. Thus:
 - a. Firstly, *support pro-active documentation of indigenous knowledge systems and associated practices and traditional occupations to facilitate continued application and sharing.* The emerging practice of documenting and reporting on indigenous knowledge systems to the UNFCCC under the Intergovernmental Panel on Climate Change should be enhanced and sustained. All actors should develop partnerships for generating knowledge and for sustainable and equitable outcomes, including

through incorporating relevant indicators on trends in traditional knowledge and the well-being of Indigenous peoples.

- b. Secondly, *promote cultural transitions towards diverse ways of knowing and being in the context of climate change and NBS*. This would entail promotion of holistic approaches linking nature and culture within integrated social-ecological systems. The links between diverse knowledge systems should be strengthened throughout global, national, and local monitoring and reporting platforms.
 - c. Thirdly, *integrate indigenous knowledge systems into development practice and climate response actions across levels*. Indigenous knowledge systems and practices should find meaningful expression in exchanges at the Local Communities Indigenous Peoples Knowledge platform under the UNFCCC and discussions related to art. 8J of CBD and Biodiversity Outlook reports. At the national level, indigenous knowledge should be mainstreamed within Nationally Determined Contributions, inter alia National Climate Change Response Strategies and interventions such as Green Economy Strategies, Sustainable Development Mechanisms (SDM), REDD+, National Adaptation Plans, among others.
 - d. *Develop a new policy framework for sustainable production and consumption* which enables the immediate upscaling of sustainable local economies, including revitalizing of indigenous food systems.
3. *Going beyond paper recognition to meaningful practice*: The policy and legal environment for recognition of Indigenous peoples' rights and indigenous knowledge has significantly improved. However, little has changed with respect to practice on the ground. Sustained efforts towards giving life and meaning to the impressive policy and safeguards gains by Indigenous peoples across levels are urgent and critical.
 - a. *Strengthen representation, full and effective engagement, and consultation protocols*: It is essential to enable robust and practical application of the tools and instruments for social inclusion and consultation such as Free Prior Informed Consent and community protocols to facilitate Indigenous peoples' self-determination in decision making and development practice towards resilience building in the context of NBS.
 - b. *Enhanced direct access to resources*: Financial and technological resources must be directly placed in the hands of Indigenous peoples. The envisioned funding for indigenous communities should be upscaled, accessible, equitable, direct and long term. To achieve this, we need to trigger shifts in both domestic and international governance and finance to value nature and realize the potential of NBS. The said financial mechanisms should be supported with appropriate regulations that are enforced at the national and sub-national levels including increased public and private funding for NBS investment (ecosystem protection, carbon sequestration, restoration, and resilience-building) while dis-incentivizing activities that harm ecosystems and rewarding effective culture-based solutions.

4. *Enhancing direct representation in decision-making arrangement:* Direct representation of Indigenous peoples in all relevant decision-making arrangements must be meaningfully realized to bring to life the slogan “Nothing for US/About Us Without Us!”
 - a. It is essential therefore to facilitate a governance transition shift towards inclusive decision-making and self-determined development – including ensuring mutually respectful partnerships across scales. Indigenous peoples should be facilitated to engage in local, national, and global decision-making processes and in relevant policy forums.
 - b. Governments should promote fair and good governance, justice, and equity and establish mechanisms to facilitate full and effective participation of Indigenous peoples in national strategies and action plans and to mainstream traditional knowledge, customary sustainable use, and equitable benefit-sharing.
5. *Respect for human rights - Safeguards and Rights-based Approaches:* Recognition, respect, and promotion of Indigenous peoples’ rights consistent with the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) is a bare minimum in efforts to promote NBS and secure benefits across the whole of society in the context of inclusive and sustainable development.
 - a. Integrate robust, effective and legally binding environmental, social and cultural safeguards and measures into all efforts to address challenges related to inclusive decision-making and self-determined development, biodiversity loss and climate change impacts.
 - b. Promote rights-based collaborative approaches that support and promote community ways of life that enrich relationships between humans and nature; respect and support their distinct and special relationship to land, waters, territories and resources.
6. *Disaggregated data-informed Monitoring and Reporting:* National and global statistics on the contributions of Indigenous peoples to nature-based solutions should be improved and promoted across scales in efforts to enhance reporting and accountability mechanisms for periodically assessing country contributions and overall progress. National and global data and reporting systems should generate disaggregated data on the status of Indigenous peoples, women, youth and marginalized groups, including through support and funding for complementary Community Based Monitoring Information Systems by Indigenous peoples.

Endnotes

- 1 This includes Climate Action Summit 2019, UN Convention on Biological Diversity, UNEP, IUCN, to name a few.
- 2 The GCF IP Policy aims to, among others, “support and promote the welfare, positive contributions and leadership of Indigenous peoples to climate change mitigation and adaptation, based on their traditional knowledge systems, livelihoods, sustainable resource management systems and practices, in a manner that is accessible, rights-based, gender-responsive, culturally appropriate and inclusive.”
- 3 Contribution from the United Nations Committee of Experts on Environmental-Economic Accounting - Engaging with the Nature-Based Solutions Coalition for the Climate Action Summit, 2019.
- 4 FAO’s submission on Nature Based Solutions (NBS), Climate Action Summit, 3 May 2019 and FAO contribution to the Nature Based Solutions workstream for the Climate Action Summit Forests and Trees: a nature-based solution to global urban challenges (FAO).
- 5 A submission by Natural Climate Solutions Alliance of Government to the UNSG Summit NBS Coalition, May 2019.
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- 25 emanyatta oor murren, e manyatta e ngeene, emanyatta oolorikan.
- 26 Kenya Wildlife Trust, Report on Researchers Meeting On Fencing In the Mara, 15th July 2018.

- 27 GoK, Analysis of The Charcoal Value Chain In Kenya, Ministry of Environment, Water and Natural Resources, Aug. 2013.
- 28 Land Cover and Land Use Mapping and Change Detection of Mau Complex in Kenya Using Geospatial Technology Isaac Ongong'a Ayuyo 1, Leonard Sweta. Department of Geography and Environmental studies, University of Nairobi, University way, Nairobi, Kenya. International Journal of Science and Research (IJSR), ISSN (Online): 2319-7064.
- 29 Indigenous, local and traditional knowledge systems and practices, including indigenous peoples holistic view of community and environment, are major source of adaption to climate change, but these have not been used consistently in existing adaption efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation (IPCC, 2014:27).
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- 34 Ibid, p. 12.

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Cameroon: The Baka, Bagyeli/ Bakola and Bedzang

By Dr Enchaw Gabriel Bachange

INTRODUCTION

The concept of nature-based solutions appears new to the world, but the art has been practised by Indigenous peoples in their ancestral lands/territories from their very inception. Unfortunately, global and country level effort towards climate change mitigation and adaptation has undermined the central role Indigenous peoples play in providing nature-based solutions to this environmental hazard in contemporary times. Forest Indigenous peoples occupy areas of highest carbon sinks, and by virtue of their harmonious interactions with nature are at a vantage position to protect, restore and sustainably manage ecosystems as a pathway for addressing both the causes and consequences of climate change (Seddon, Sengupta, García-Espinosa, Hauler, Herr and Rizvi, 2019). It is not a fallacy that Indigenous peoples effectively had used indigenous knowledge and practices to preserve forest and forest resources before the advent of the neoliberal conservation paradigm, which is yet to check, let alone reverse, continued loss of biodiversity and degradation of even national parks and reserves, which governments have brought under their aegis (Tumnde, 2001). Such parks and reserves coincide with the ancestral lands of Indigenous peoples.

Just as the protected area paradigm, current applications of the REDD+ mechanism (Dkamela, 2011) and the Green Climate Fund (GCF) vis-à-vis nature-based solutions to climate change lack social legitimacy, particularly as Indigenous peoples and their organizations are yet to be engaged in NBS negotiations both at global and country levels. Countries such as Cameroon in the Central African subregion are still grappling with intended nationally determined contributions (IDNCs) to the Paris Agreement (UNFCCC, 2021 and GoC,¹ 2018) and Indigenous peoples in the country are not under any of the two ministries directly concerned with country level climate change agenda. The call for this scoping study on the role of Indigenous peoples in the search for nature-based solutions to climate change is quite timely, especially in the case of Cameroon. Forest Indigenous peoples in the country have been evicted from their ancestral lands to make way for conservation and have been subsumed under Bantu chiefs and communities, with the government seeing no contributions to be made by them towards conservation and climate change mitigation and adaptation.

In a legal perspective, Cameroon has no laws directly related to climate change or addressing Indigenous peoples' concerns, beginning with recognition of their existence. Current policy documents are void of tangible reference to climate change and Indigenous peoples. Policies related to forest, such as Law N° 94/01 of January 20, 1994 to lay down forestry, wildlife and fisheries regulations, are attuned to a generalized concept of sustainable forest management and do not identify the specific impact of climate change on Indigenous peoples so as to map out appropriate strategies for redress and collective achievement of climate change mitigation and adaptation. Strategies and recommendations made so far as per those documents only serve to improve understanding of Cameroon natural resources and add resilience to the natural systems in coping with anthropogenic stresses.

It has become clear that global climate has metamorphosed from a nature change to anthropogenic forcing² (Donev et al. 2020), and therefore securing indigenous guardianship of vital ecosystems implies guaranteeing nature-based solutions to climate change, sometimes called “natural climate solutions.” Fortunately, the forestry and wildlife law of 1994 is undergoing revision and the findings of this study will, hopefully, create awareness for a policy shift towards the essential role Indigenous Baka, Bagyeli/Bakola and Bedzang stand to play in nature-based solutions to climate change.

NBS STUDY

There is growing unanimity that a knowledge gap exists between forest governance experiences and practices of Indigenous peoples and the extent to which they can feed nature-based solutions to climate change. At global and country levels, little or no evidence exists on concerted actions and strategies on how they should be engaged with bodies pushing NBS to climate change. Indigenous peoples are completely shunned from consultations, and defining a NBS approach within the Green Climate Fund as an integral part of the sector guidelines for the impact areas of investment in the Forest and Land Management, Ecosystems and Ecosystem services affirms the controversial and exclusionary path chosen by the rich nations. This is actually misleading as it gives the impression that nature-based solutions can be a substitute for the urgent task of decarbonizing all sectors of the economy. Further, the effort to financing climate change targets by the UNFCCC's Standing Committee on Finance (SCF) in synergy with the GCF focuses on carbon, and therefore lacks social legitimacy and equity and is not on track with the discriminations experienced by Indigenous peoples in developing countries. Though many of these countries have ratified the non-binding United Nations Declaration on the Rights of Indigenous Peoples, applying its provisions remains herculean.

Cameroon being one of these developing countries, the government has intentionally deferred the ratification of ILO Convention 169, which is binding, rendering the issue of indigeneity very critical in the country, with appellations such as vulnerable and minority groups and autochthons officially used in lieu of Indigenous Peoples. Indigenous Baka, Bagyéli/Bakola and Bedzang in Cameroon have been evicted from their ancestral lands to make way for parks, reserves and

forest management units (UFAs³). And where they have been resettled at extant Bantu local communities, they have neither customary nor statutory land rights, with improvised sacred groves for Ngengi, the god of the forest, subjected to desecration, degradation and deforestation from logging agents and Bantu populations.

The government justifies the non-recognition of indigenous land rights with structural and legal challenges, implying the absence of a political will. The Baka, Bagyeli/Bakola and Bedzang are bogged down by a knowledge gap on the provisions of the UNDRIP, the Convention on Biological Diversity, GCF, UNFCCC's SCF and the Intended Nationally Determined Contributions of Cameroon to the Paris Agreement. Though co-implementation is advocated, ministerial portfolios in Cameroon are less enabling for the appropriate ministry to engage Indigenous peoples in prior consultations/discussions and co-designed decisions vis-à-vis NBS. This misplaced tutelary shuns the practices and experiences of the Baka, Bagyeli/Bakola and Bedzang from gaining traction within the framework of NBS to climate change even at country level. The findings of this study will provide inputs from indigenous peoples for consideration in future GCF portfolio.

This scoping study on evidence-based nature-based solutions aims to show how the perspective of the Baka, Bagyeli/Bakola and Bedzang and their traditional practices of governing their lands, territories, forests and resources are contributing to nature-based solutions to climate change. It also determines how the government of Cameroon is using a NBS framework in the country's Nationally Determined Contributions to the Paris Climate Agreement and other national plans. Further, it looks at the necessary NBS elements and components that can respond to the rights of the Baka, Bagyeli/Bakola and Bedzang peoples and the possible ways through which they could be engaged in NBS discussions at the local/national level.

The research methodology used to generate data was adapted to the data collection approach of **Intergovernmental Science-policy Platform on Biodiversity and Ecosystem Services**. The study was basically qualitative, using a desk exercise for secondary data collection and a few interviews and phone surveys for primary data sourcing. Secondary data consisted of historical literature gleaned from scientific publications and reports which make reference to nature-based solutions to climate change, the UNFCCC, REDD+ projects, UNCBD, Green Climate Fund, UNFCCC's Standing Committee on Finance, Intended Nationally Determined Contributions to the Paris Agreement from the Republic of Cameroon and the Republic of Congo. Other sources were binding and non-binding international instruments to which Cameroon has committed itself or not but that are relevant to Baka, Bagyeli/Bakola and Bedzang rights and guardianship of their land and territories for nature-based solutions to climate change and pertinent reports.

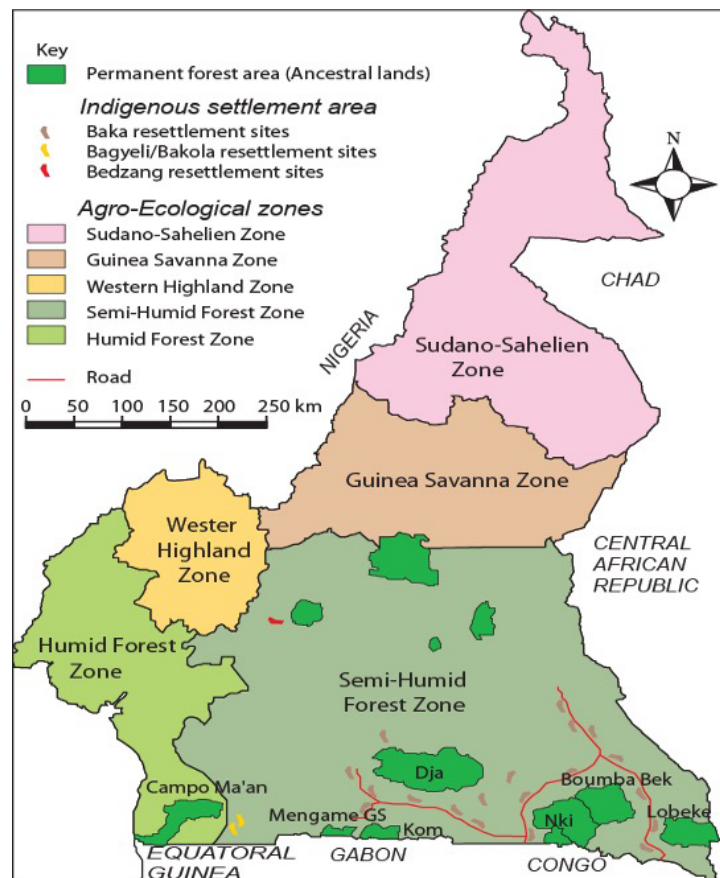
Primary data were oral histories collected from key informants in relation to Baka, Bagyeli/Bakola and Bedzang rights and guardianship of their land and territories for nature-based solutions to climate change in Cameroon. The oral histories were collected through four physical interviews of relevant government officials in Yaounde and four phone surveys with many informants contributing in Djoum, Mintom, Koudoukoudoum, Nyambande and Bamenda.⁴

Study Area

Cameroon is located in the Gulf of Guinea at the intersection of Western and Central Africa and borders the Bight of Biafra between Nigeria and Equatorial Guinea. However, more than 20% of the country is in West Africa while close to 80% is in Central African subregion, and for that reason many people describe it as a Central African country. Spatially, Cameroon is located between longitudes 8° and 16° east of the Greenwich Meridian and between latitudes 2° and 13° north of the Equator. Its surface area is 475,650 km² and the population is estimated at over 27,299,777 inhabitants as of August 25, 2021 (<https://www.worldometers.info/>, 2021), among whom are Indigenous peoples, particularly the hunters/gatherers (Baka, Bagyeli/Bakola and Bedzang).

The neighbors of Cameroon are Chad, Central African Republic, Equatorial Guinea, Gabon, Nigeria and the Republic of Congo. The country is often described as Africa in miniature as it exhibits all the major climates, relief, soils and vegetation types of the Continent. That notwithstanding, within the framework of the National Plan for Environmental Management ten ecological areas were identified, which were later grouped into five ecological zones (Fig. 1) by agricultural sector experts due to the relationship between the physical environment and the crops grown (IRAD, 2007 and NBSAP, 2012).

Fig.1: Ecological Zones in Cameroon



Source: Adapted by Enchaw G. B. (2021) from MINEPDED (1996) and IRAD Annual report (2007)

The first zone is the degraded forest area found in parts of the Centre, Littoral in the Gulf of Guinea, and the South West Regions, which is also known as the humid forest zone with mono-modal rainfall. It covers a surface area of approximately 4,671 km² and hosts neither forest Indigenous peoples nor sacred forests. It is therefore highly degraded through logging and small-scale agriculture, which are not part of the practices of Indigenous peoples.

The second ecological zone is the dense forest that covers a surface area of 181,681 km² in parts of the Centre, East and South Regions of the country. This is the Cameroonian section of the Congo Basin Forest and represents 10% of this second lung of the world after the Amazon Basin Forest. Often referred to as the southeast forest zone of Cameroon, it hosts the hunter/gatherers known as forest Indigenous Peoples or Pygmies and is the area for this scoping study. This is an ecological zone that Indigenous peoples have long preserved using indigenous knowledge (carved into sacred groves for their various gods), and because of its richness in flora and fauna (Tchatchou, Sonwa, Ifo and Tiani, 2015) it serves for nature-based solutions to climate change.

The eviction of the Baka, Bagyeli/Bakola and Bedzang from this forest compartment exposed it to the creation of parks, safari hunting zones, and logging concessions, depriving the Indigenous peoples of just an elephant a year to accomplish *Njengi* cultural rites (FAPI; Bouba & Enchaw; Sherpa & Sherpa; Maleya Foundation; Biangalen-Magata, Bugtong-Biano & Batang-ay, 2019). This ecological zone currently hosts most of the forest management units, a majority of the national parks and reserves, and mining concessions in the country (GoC, 2012). These new stakeholders and their activities neither guarantee nature-based solutions to climate change nor natural climate solutions, as carbon sinks are depleted with logging companies breaching reforestation policies and mining companies not rehabilitating their mining and prospection sites as required by Articles 37(1)(2) of Law No.96/12 of 5 August 1996 (GoC, 1996).

The Western Highlands, a savanna zone referred to as the Western Grassfields, constitutes the third ecological zone of Cameroon spreading over a surface area of 55,158 km.² It covers the entire West and North West Regions, a small part of the Adamawa Plateau, and the Tikar Plains located between the southeastern parts of the West Region and the northwestern parts of the Centre Region. The fourth ecological zone is the Guinea Savanna zone with a surface area approximately 110,316 km² that covers almost all of Adamawa Plateau and parts of the North Region. The Sudano-Sahelian areas in the northern part of Cameroon constitute the fifth ecological zone. It is approximately 10,268 km² in area and extends to the Mandara Mountains, the low lying plains of the Far North Region, and the Benue valley.

Cameroon is also very diverse in terms of ethnicity, as it has over 200 ethnic groups of which three are Indigenous peoples and include the Mbororo pastoralists, Pygmies (hunter/gatherers) and Kirdi (ACHPR, 2005). Mbororo are nomadic cattle herders spread in nine of the country's 10 Regions with greater concentrations in the North, North West, West, Adamawa and East Regions of Cameroon. They are subdivided into Wodaabe, Jafun and the Galegi or Aku and their population was estimated at between 1.8 to 2 million people representing approximately 12% of the country's population (Nguiffo, Amougou and Cotula, 2017). The Kirdi are made up of Mada, Mafa and Mandara and live high up in the Mandara Mountain range in the Far North Region of Cameroon.

Historically, Pygmies are the first settlers of the Congo Basin Forest and through their migratory trends they currently live in parts of the East, Centre and South Regions of Cameroon and include the Baka, Bagyéli/Bakola and Bedzang. The most cited population data for Pygmies stood at 44,300 persons, representing about 0.4% of Cameroon's total population, which was 17,463,836 in 2010. Of this number, Baka were estimated to be 40,000; Bagyeli/Bakola 4,000; and Bedzang around 300 (Fitzgerald, 2011 and IWGIA, 2019). Other sources estimated the populations of Baka at 70,000-100,000; Bagyeli/Bakola, 10,000-30,000; and Bedzang, 800-1,000 (Nguiffo, Amougou and Cotula, 2017). The Bakas live essentially in the East and South Regions of Cameroon. The Bagyéli/Bakola are spread over a surface area of about 12,000 km² in the South Region, precisely in Akom II Sub-division, Bipindi, Kribi and Lolodorf while the Bedzang live in the Centre Region, the northwest part of Mbam in Ngambè Tikar area (Nguiffo, Kenfack and Mballa, 2009).

Cameroon has many rivers within four main drainage basins, which are the Atlantic, Niger, Congo and Lake Chad. The Atlantic Basin is drained by Rivers Sanaga, Nyong, Ntem and Cross River. The Niger Basin extends to Nigeria and is drained by River Benue and its tributaries in the Cameroon stretch. The Lake Chad Basin in the north is drained by Rivers Logone and Chari. The Congo Basin in the southeast is drained by the Dja, Kadeï, Ngoko and the Sangha Rivers. The rivers in the Congo Basin and their resources are very important to the socio-cultural life of the Baka, Bagyeli/Bakola and Bedzang, particularly the women whose accomplishment of Yeyi cultural rites requires *Nbwahka* fish.

When Cameroon promulgated the 1994 forestry and wildlife law, hopes were high that the historical inadequacies of evicting forest Indigenous peoples from their ancestral lands without their free, prior and informed consent (FPIC) (Art. 10(1) of UNDRIP and Art. 16(2) of ILO Convention No.169) would be redressed for them to be able to revamp their response strategies to climate change using indigenous knowledge. But the same injustices continued even in the era of decentralization (Assembe-Mvondo, Wong, Loft and Tjajadi, 2015), stifling Pygmies from using their indigenous knowledge, beliefs and practices to conserve, restore and sustainably manage natural and degraded ecosystems for climate change mitigation and adaptation and social and economic development. This veers sharply from the objective of Tebtebba, which is to fill the knowledge gap on the potentials and involvement of Indigenous peoples to contribute to NBS at all levels. On the contrary, indigenous groups in Africa are making major strides towards Indigenous peoples' guardianship which ties in with the spirit of NBS to contemporary climate change and constitute a window to be exploited by African Accredited Entities in preparing their future GCF portfolio.

Definitions of Key Concepts

Elements and components of NBS to climate change

The initial idea that science could provide appropriate solutions to climate change crisis seems to be defeated in the 21st century with a shift to nature as the pathway to solutions to climate change. Natural solutions to climate change are currently represented by two distinct and yet interconnected terms, which are Nature-based Solutions to climate change and Natural Climate Solutions (NCS). These two concepts are different in the sense that NBS is an epitome of an “umbrella concept,” which “covers a whole range of ecosystem-related approaches all of which address societal challenges” including climate change (Cohen-Shacham et al., [2016](#), p. 10; Pauleit et al., [2017](#)) while NCS are more narrowly focused and tailored to climate change mitigation (Table 1).

Table 1: Indicators of Nature-based Solutions and Natural Climate Solutions

Nature-based Solutions to climate change	Natural climate solutions
Afforestation	Reforestation
Agroforestry	Natural forest management
Coastal management	Improved plantations bio char
Restoration of floodplains	Cropland nutrient management
Reforestation	Grassland restoration
Forest protection	Tidal wetland restoration
Mangrove restoration	Peat land restoration
Grassland management	Avoided wood fuel
Soil conservation	
Green roofs and green walls	
Urban open spaces and reforestation	
Wind breaks and rainwater capture	
Wetland restoration	
Community gardens	

Source: Adopted from Albert et al. [2017](#); Nesshöver et al. [2017](#); Fargione et al. [2018](#) and Griscom et al. [2017](#) as presented by Osaka, Bellamy and Castree (2021)

From these indicators in Table 1, it can be deduced that nature-based solutions to climate change and natural climate solutions are perceived and presented as pathways for addressing social and environmental challenges of contemporary times. These concepts arose at different times and in slightly different institutional contexts; thus, although they are closely related, there are significant differences in how they are framed, both in academic and grey literature and in

public discourse. Table 1 clearly depicts areas of divergence and convergence of the two concepts and their applicability.

Though nature-based solutions predate natural climate solutions, the concept of ‘nature-based solutions’ is still considered quite recent as it emerged only in 2009 during negotiations under the UN Framework Convention on Climate Change. At that time, it was perceived as referring to a bundle of possible responses to the need for mitigation of and adaptation to climate change. This view was influenced by the approach adopted for reducing emissions from deforestation and forest degradation (REDD), which metamorphosed to reducing emissions from deforestation and forest degradation plus the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) in developing countries. The evolution came when it was realized that REDD was essentially eco-centred with anthropogenic deficiencies, which constituted germs for its failure (Dkamela, 2011).

The term, ‘nature-based solutions,’ became more clearly outlined in a 2016 Resolution of the International Union for the Conservation of Nature (IUCN). It then refers to: “actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (IUCN, 2016). Its core message is the idea of win-win solutions that involve protecting, restoring and sustainably managing ecosystems to address society’s challenges and promote human well-being.

The definition notwithstanding, the world is still grappling with the initial controversy embedded in the term ‘nature-based solutions’ (FPP, 2021) as observed again during negotiations of the UN Convention on Biological Diversity towards a post-2020 Global Biodiversity Framework and in discussions towards raising ambition under the UN Framework Convention on Climate Change (FPP, 2021). This controversy is largely on two counts. The first is that most of its enthusiastic supporters are large oil companies, governments of wealthy countries with high emissions, which account for much of the historical and on-going damage to the planet and communities worldwide (UN Global Compact, 2019). Secondly, these advocates define ‘nature-based solutions’ to suit the activities they would like to see funded, a perspective that collates Nature-based Solutions to an alternative to decarbonizing the economy (Austin et al., 2021). In this regard, emphasis is on climate change mitigation and adaptation, while issues of profound emissions cuts, designing NBS with and for indigenous and local communities, securing their land rights, territories and cultural practices, compensating for low ambition in other sectors, ensuring that needed energy, food, urban and infrastructure net-zero transformations support one another (WWF Inter., 2020 and Austin et al., 2021) are deemphasized.

The controversy embedded in NBS to climate change echoes and re-echoes concerns earlier raised about offsetting carbon emissions through REDD+ projects and carbon trading. These debates are still raging and it is increasingly clear that cutting emissions is far more crucial as *Annex A* countries hide behind emissions trading to multiply their emission rates with overwhelming disregard for the principle of common but differentiated responsibilities⁵ (CBDR) towards the scaling down of climate change and its effects on man and nature (UNFCCC, 1992). On the ground, REDD+ projects continue to be challenged by Indigenous peoples and forest communities for failing to deliver equitable benefits and undermining rights guaranteed under international law standards

and safeguards, including rights to own and control lands, territories and resources, and rights to FPIC (FPP, 2021). In most of Central African subregion, even in Cameroon, where pilot REDD+ projects were introduced, no palpable shift has been made in policy and practice (Kengoum and Tiani, 2013) for co-designed and co-implemented climate change mitigation and adaptation projects involving indigenous Baka, Bagyeli/Bakola and Bedzang (Enchaw&Njobdji, 2013).

Nature-based solutions are physical conservation, restoration and management interventions that can be facilitated by institutional, management or policy decisions and arrangements that run from local to global scales (WWF Inter., 2020). It is in this regard that social legitimacy can be upheld for engagement of Indigenous peoples in NBS to climate change. Thus, recognizing and appropriately funding projects of Indigenous peoples and communities who are managing these ecosystems is a crucial plank in any effective response to secure rights and secure ecologies (IUCN, 2020). The establishment of direct access channels for them, through which local actions can be recognized, supported and secured, is an essential component of any commitment to nature-based solutions to climate change (FPP, 2021).

Indigenous Peoples

The concept of Indigenous Peoples has evolved over time though there is still no universally accepted definition of it. The United Nations holds that *Indigenous communities, peoples* and nations are those which have a historical continuity with pre-invasion and pre-colonial societies that developed on their territories. Those who have self-identified as indigenous consider themselves distinct from other sectors of the societies now prevailing in those territories or parts of their ancestral lands, which served as ecosystems to be protected, sustainably managed and restored for climate change mitigation, adaptation and human well-being. Even ILO Convention 169 of 27 June 1989, the non-legally binding UNDRIP, the African Commission on Human and Peoples Rights or the Constitution of Cameroon do not provide any clear definition of Indigenous Peoples.

That notwithstanding, in 2003 the African Commission on Human and Peoples Rights Working Group on Indigenous Populations provided some criteria for the identification of Indigenous peoples in Africa. While self-identification remains a fundamental criterion (Article 1(2) of ILO Convention 169), others can use cultures/livelihoods systems that are closely attached to particular lands and territories, disregard for their contributions to nature-based solutions to climate change, and marginalization from national development as important criteria for identifying Indigenous peoples. In this regard, Pygmies and Mbororo pastoralists constitute Indigenous peoples in Cameroon as captured by Cameroon's presentation during the ACHPR Regional Sensitisation Seminar on the Rights of Indigenous Populations/Communities (RIP/C) in Central Africa in September 2006, Yaoundé-Cameroon (ACHPR, 2006) and the findings of a 2009 study initiated by the Ministry of External Relations which were validated in 2011 in the coastal town of Kribi (GoC, 2009).

Ancestral lands/domains

Ancestral lands or ancestral domains refer to lands belonging to an indigenous cultural people or community based on ancestry and includes the continuous and open possession and occupation of the said Indigenous peoples or communities and their members whose right to such lands,

though customarily in character, shall be protected to ensure non-encroachment and dispossession without free, prior and informed consent (Art. 10 UNDRIP). Ancestral lands, territories and resources incorporate spiritual and cultural aspects seldom acknowledged in land titles and legal doctrine about trading ownership. In the southeast forest zone of Cameroon, the Baka, Bagyeli/Bakola and Bedzang had managed this category of lands through the use of indigenous knowledge and practices for co-benefits as they invoke a mutual responsibility and relationship between nature and people (Sheryl, 2008), rendering them most valued for nature-based solutions to climate change.

Land dispossession

Inverse proportionality exists between land dispossession and the contribution of Indigenous peoples to nature-based solutions to climate change. Loss of lands, territories and resources by the Baka, Bagyeli/Bakola and Bedzang through eviction from their ancestral lands (Art. 8(2b) UNDRIP), which are within the permanent forest estate (12,788,026 ha) in the southeast of Cameroon, divest them of the chances and opportunities to protect, sustainably manage and restore natural and modified ecosystems (IUCN, 2016). Such eviction occurs without their free, prior and informed consent (Art. 10 UNDRIP), and no compensation (Art. 16(5) Con. 169) is made (Schmidt-Soltau, 2009). Worse still, the Baka, Bagyeli/Bakola and Bedzang have been subsumed under Bantu local communities and chiefs (Art. 8(1)(2c&d) UNDRIP) where they hold no customary or *de jure* rights over the lands, territories and resources in their new settlement sites (Art. 14(1) Con. 169).

These social challenges are not taken into consideration by bodies pushing NBS to climate change even though it is clear that land is a very strategic socio-economic asset, particularly in poor societies where wealth and survival are measured by control of and access to land. On the contrary, loss of lands, territories and resources by indigenous pastoralists is due to population pressure, farmer/grazier conflicts, non-registration of land rights, the semi-sedentary lifestyle some of them still practise and climate change (Fon and Django, 2021). The non-application of Decree No. 78/263 of July 3, 1978 to establish the terms and conditions for settling farmer-grazer disputes also predisposes pastoralists to loss of lands, territories, resources and to protracted conflicts. Dispossession of Indigenous peoples of their ancestral lands implies erosion of their existential foundation and forfeited opportunities for culture-based solutions to climate change by harnessing indigenous knowledge and practices to protect ecosystems for climate change mitigation and adaptation or to restore ecosystems that have been modified and/or degraded through logging activities.

Inter-community dialogue

The government has created a conflict situation between Indigenous peoples represented by Baka, Bagyeli/Bakola and Bedzang and local communities represented by the Bantu over customary lands. Government evicted Indigenous peoples from their ancestral lands and subsumed them under Bantu and, without recognizing their existence and their communities as administrative entities, proposed that they and the Bantu should hold inter-community dialogue for

territorial and chieftdom eligibility (Article 2 of Decree No 77/245 of July 15, 1977). Negotiations between Indigenous and Bantu communities, without any mediator, for the acquisition of customary rights over the land, territories and resources found in their current resettlement sites are feasible. These customary rights are a precondition for the recognition of their communities as administrative entities and their traditional authorities as auxiliaries of the administration (Cameroon presentation during the AU RSS on RIP/C in CA13–16/9/2006 and Inspector N°2 MINEPDED, 08/01/2021, personal communication). Such recognition will guarantee the Baka, Bagyeli/Bakola and Bedzang rights over territories where they are resettled and will not subject improvised sacred groves for both cultural accomplishment and NBS to climate change to aggressiveness from Bantu local communities and logging companies.

Discrimination against Indigenous Peoples

This refers to:

1. Prohibiting commercialization of use-rights whereas Indigenous peoples rely predominantly on forest products and their survival depends on the sale or exchange of those products (Law N° 94-01 of 20/1/1994 and Decree N° 95/531 of 23/8/1995).
2. Compelling Indigenous peoples to show proof of occupation or exploitation of land with buildings, dwellings and outbuildings, sheds and other structures as well as plantations/farming or grazing areas as proof of exploitation (Ordinance N°.74-2 of 6 July 1974) is indicative of limited knowledge of their lifestyle and units of their social life.
3. Compelling Indigenous peoples to acquire customary land rights from mainstream Bantu local communities through inter-community dialogue for territorial and chieftdom eligibility (Article 2 of Decree No 77/245 of July 15, 1977).
4. The *de facto* exclusion of indigenous communities from community forests; legal exigencies for the acquisition of community forests in the non-permanent forest estate (6,850,974 ha) where Indigenous peoples usually do not have customary land rights (Law N° 94-01 of 20/1/1994 and Decree N° 95/531 of 23/8/1995).
5. Non-reception of annual forestry royalties by Indigenous peoples due to their distribution in terms of village communities whereas indigenous communities are not recognized as such by the government and Bantu chiefs.
6. Creation of protected areas in ancestral lands and their limits determined without the free, prior and informed consent of Indigenous peoples (Art. 16(2) Con. 169).
7. Socio-economic exclusion of indigenous populations/communities in Cameroon where their exact number has been established.

PERSPECTIVE OF THE BAKA, BGYELI/BAKOLA AND BEDZANG TO USE OF NATURE AS SOLUTIONS TO CLIMATE CHANGE AND OTHER PROBLEMS

The perspective of the Baka, Bgyeli/Bakola and Bedzang to the use of nature as solutions to climate change and other problems is succinctly captured by a caption employed by some scholars in Latin America, “Nature-based solutions by people of nature” (Mirza, Razzaque and Rozario 2020). Being the peoples of nature, they live nature, and therefore, it is no coincidence that Indigenous peoples make up 5% of the global population yet protect 80% of global biodiversity. A study estimated that at least 17% or 293,061 million metric tons (Mt) of the total carbon stored in the global forest lands are managed by Indigenous peoples and local communities (Frechette et al., 2018).

For centuries and even millennia, Indigenous peoples have been stewards of the land, air, and water, forging reciprocal relationships with plants, animals, and other organisms, developing vast repositories of knowledge and wisdom that rival modern science (McCarthy, 2020) in leveraging nature-based solutions. In Cameroon, the Baka, Bgyeli/Bakola and Bedzang represent about 0.4% (44,300 persons) of the total population, which stood at 17,463,836 inhabitants in 2010. Cameroon is one of the six countries in the Congo Basin Forest, (CBF) with a forest cover of 26,855,005 hectares, which is approximately 10.02% of a total 268,142,414 hectares. The Cameroon share of the CBF is made up of 71.09% dense forest and 28.91% non-dense forest, all of which coincide with the home or ancestral lands/territories of forest Indigenous peoples in the country. Its carbon stock is estimated at 5,043 millions of tons (de Wasseige et al. 2009 and Tchatchou, Sonwa, Ifo & Tiani 2015).

The extent to which the Baka, Bgyeli/Bakola and Bedzang interact with nature in Cameroon is eloquent testimony that they uphold nature as a solution to all their challenges including climate change. Within this existential perspective, a direct synergy exists between nature-based solutions and traditional knowledge of Indigenous peoples that serves as an important tool for managing climate change (McCarthy, 2020). Nature here being a broad concept, it should be perceived within the confines of a carbon dioxide (CO₂) removal vector from the atmosphere. It encompasses the component of forest associated with carbon sinks and that of land associated with soil carbon sequestration and land-based climate change mitigation potentials. Forestland acts as a carbon sink, absorbing and storing tons of atmospheric carbon annually in the soil carbon pool (Mirza, Razzaque and Rozario 2020 and Ontl & Schulte, 2012).

Phone surveys provided us with information on the different appellations of forest in the languages of Baka, Bgyeli/Bakola and Bedzang and the connotations of such appellations. Forest is called *bélé* in Baka language, in the language of the Bgyeli/Bakola, *dyii*, and in Bedzang language, *mboo*. Etymologically, *bélé*, *dyii* and *mboo* have to do with home or dwelling place, which could be translated to mean ‘*cradle of life*’ and ‘*focal point of life*,’ implying that the life of a Baka, Bgyeli/Bakola and Bedzang revolves around forest as all aspects of their units of social life are inextricably linked with the forest. Similarly, Bgyeli/Bakola and all initiation rites of the Baka, Bgyeli/Bakola and Bedzang, be they young men as concerns *Njengi* among the Baka or *Minkoura* among

the Bgyeli/Bakola or young women with respect to *Yeyi*, take place not just in the forest, but in thick compartments of the forest hosting the spirits of their gods, and which they have carved out as sacred forests (Ekele Daniel, *Kobo Ntolo* Regine, Ndelua Luc, Abama Virginie and Ngoniem Madeleine, personal communication).

Besides the use of forest by the Baka, Bgyeli/Bakola and Bedzang for agriculture, hunting, gathering, harvesting of construction materials for *mongulu* (photo 1) and traditional pharmacopeia, one of the fundamental ways they use the forest is for spiritual purposes in various sacred groves and shrines, which receive the greatest cultural protection. Where indigenous Pygmies construct *mongulus* for settlement, they do not fell trees as they provide shade and keep sinking carbon. The creation of sacred forests is closely linked to spiritualism. Those who, in the course of hunting and gathering expeditions first discovered the spirits that live in certain parts of the forest, became the priests of such shrine-bearing compartments and formulated rules governing access to and the use of resources in them. These forest compartments automatically became sacred forests and gained cultural/spiritual protection.

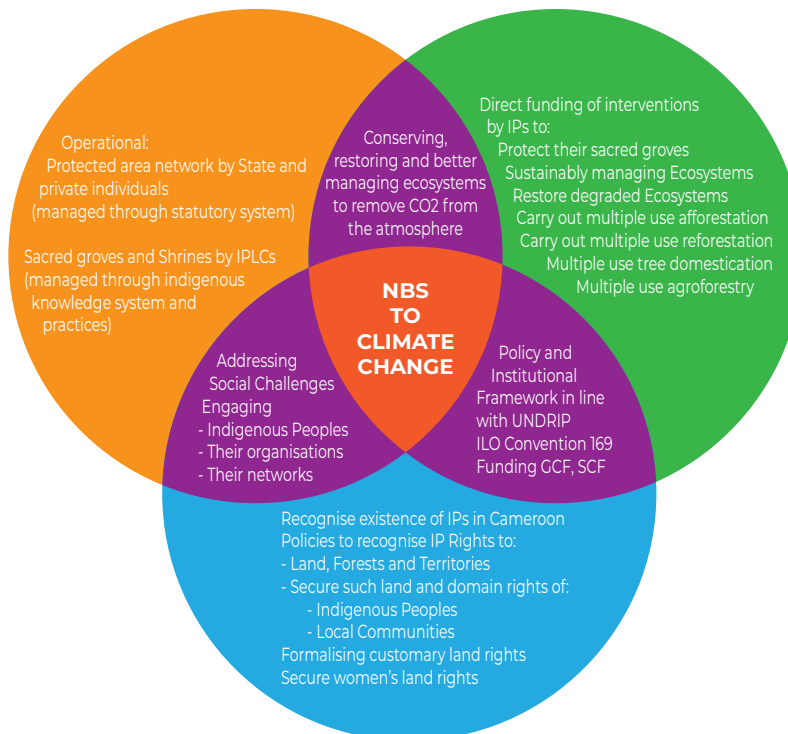


Photo 1: Mongulus Huts constructed with leaves by a Pygmy woman for her family in Minko'o. (Photo credit: Enchaw, G.B., May 2010)

The creation of sacred forests, particularly around catchment areas, watersheds and wetlands, harvesting of parts of certain plants only after proscribed rituals and the domestication of potent plant species constituted some of the most effective and adaptable traditional conservation strategies of the Baka, Bgyeli/Bakola and Bedzang. Phone survey with the Lelewal Foundation Focal Point in Djoum, the traditional chief and an elderly woman (*Kobo*) of Minko'o II revealed that the priests of Njengi Sacred Forests usually used religious beliefs and superstitions associated with fetishes and prohibitions entrenched in taboos for the protection of biodiversity in sacred forests. The interviewees were unanimous that monitoring in these sacred forests is effected through the forces of belief, and such forces are enshrined in traditional symbols (totems) and spirits (Martin Paul Nsamba, Zeh Ekomba Gaston and *Kobo* Ntolo Regine, personal communication). This is not the case with modern protected areas where physical persons using telemetric systems⁶ and field surveys carry out monitoring (Hakizumwami, www.iucn.org/ and Park, 2001). These traditional prescriptions governing biodiversity conservation had been effectively used in and around Njengi forests as conservation tools without recourse to expensive administrative and material resources for policing the area.

This system of traditional conservation, which scales up nature-based solutions to climate change at minimal cost, is also practised in Nso and Oku communities carried out under the supervision of the *Kwifon*, which is the regulatory society of the community. Though weakened by the park and reserve approach, the traditional symbols and interpretations are still valid and respected in the area. It has been proven that it is difficult to dissociate Indigenous peoples from their nature-based practices. Whether evicted or not, they still maintained the close attachment to nature for solutions to their problems including climate change.

Figure 2: Perspective model of NBS for Indigenous Peoples



Source: Conceived by Enchaw G. B. 2021

Informants indicated that among the criteria determining an appropriate settlement site for the Baka, Bgyeli/Bakola and Bedzang are the presence of abodes of their gods close to their settlements and availability of wildlife. When they were evicted from their ancestral lands, the first thing each lineage head did was to first identify abodes of their gods in order to create sacred forest where they could continue to commune with their ancestors so as to keep their units of social life intact and facilitate the search for solutions to their social and economic problems (Fig.2).

Their forest is more resilient than a network of parks and reserves, as research has shown that lands managed by Indigenous peoples and local communities with secure rights experience lower rates of deforestation, store more carbon, hold more biodiversity, and benefit more people than lands managed by either public or private entities. Each sacred forest belongs to a particular god of the forest (*Njengi, Joboko, Kosse and Yeyi*) and has a shrine where the custodians commune with the ancestors for intercession on behalf of the lineage members for good farming climate, high birth particularly of males, good health, harvest and fast response to traditional treatment and healing (photo 2). Most of the potent herbs were planted in such sacred groves (Ngum John, personal communication) (Enchaw, 2009). In Nso and Oku local communities as well as among the Pygmies, sacred forests are actually the abodes of the gods of the land and are not to be disturbed, cultivated in any form or exploited. These abodes also serve as gene banks with potent plants which are harvested by the priests of the abodes, persons authorized and/or initiated persons for medicinal purposes. Thus, the Baka, Bgyeli/Bakola and Bedzang and local communities contribute to climate change mitigation through the preservation of their forestlands.



Photo 2: Cultural symbols. The lineage head of Mbockenghas, Tankiy, Shuukov and Semti (Shuufai Yungkui) holding the Nso traditional symbol (sho-oh ngven) used by the Fon to acknowledge the tenancy of a traditional landlord over a tract of land. A: Calabash B: Peace plant C: Entrance to his shrine in Meluf. (Photo credit: Tatah J.B, 25/10/2007)

Cultural symbols

The indigenous communities use cultural symbols in conserving forest and forest-based resources. The *sho-oh ngven* (photo 2) is endowed with a lot of symbolism and confers to a traditional landlord the powers to pour libation using the wine in order to honor the connection with the gods of the land. The peace plant is a symbol of peace in the community and a traditional landlord uses it to maintain justice and to call those misusing forest and other resources to order by placing it on their tracts of forestland or farms as a form of injunction (Fai Tanini, Denis Mborong and Shey Thomas Senjo, personal communication) (Enchaw, 2009).

In Ambelle and Kom land, cultural symbols are also commonly used in preserving the forest and its resources. In Akua-fichua Sacred Forest in Laikom, clearing the road leading to it and around it is done with sticks only (Fon Vincent Yuh II, 25/10/2007, personal communication). The use of less sophisticated tools for clearing in and around this sacred forest may not only be a traditional symbol or taboo but an eloquent conservation strategy. The trees in Akua-fichua sacred forest enjoy adequate protection and were among the largest in terms of height and diameter in all the forest compartments visited during field work (personal observation) (Enchaw, 2009).

Despite the motivation and interest of the Baka, Bgyeli/Bakola and Bedzang to use nature as solutions to climate change and other problems, many of the traditional conservation practices are progressively being eroded despite their effectiveness in providing NBS to climate change. The Baka, Bgyeli/Bakola and Bedzang, though self-identified as indigenous, are still grappling with the issue of recognition (Article 1(2) of Part I of ILO Convention 169). Competing land claims between Indigenous peoples and the State, and Indigenous peoples and local communities to which they have been subsumed, riddle the use of their traditional knowledge and practices within the context of Nature-based Solutions as Criterion 1 of the IUCN Guidance stipulates.

Co-benefit activities within NBS Framework

The eviction of Baka, Bgyeli/Bakola and Bedzang from their ancestral lands by the State of Cameroon predisposed them to multiple social challenges, which they are struggling to overcome within the framework of Nature-based Solutions. Their effort to achieve some of the Aichi biodiversity targets is galvanized by some CSO such as Lelewal Foundation and is in line with Criterion 1 of the IUCN Guidance Standard and the national policies and government-supported strategies captured in the second version of Cameroon's National Biodiversity Strategy and Action Plan (NBSAP II) of May 2012, the Growth and Employment Strategy Paper, Cameroon's 2035 vision, and the decentralized forest management policy.

In their current settlement site, they are actually engaged in conservation through protection, restoration and restorative activities and sustainable use of resources in order to address societal challenges. According to the Chiefs of Ando'o and Minko'o II and the Focal Point of Lelewal Foundation, Indigenous peoples in Djoum and Mintom have improvised sacred forests in Ando'o, Djouze, Miata, Mfem, Minko'o II and Nkan for the accomplishment of cultural rites and

to contribute to climate change mitigation. The interviewees were unanimous that the Lelewal Foundation engaged Indigenous peoples in those localities through their community-based organizations - MANI BELA, ADEBAKA, ABAGUENI and ABAWONI - in an effort to build their capacities and transform the Baka, Bgyeli/Bakola and Bedzang from mere hunter/gatherers to small-scale farmers. By complementing hunting and gathering with farming activities, these Indigenous peoples improved upon their agroforestry practices. They cultivate food crops such as cassava and cocoyams, cocoa and other fruit trees in community and individual farms for food security and poverty alleviation. It was also gathered that Indigenous peoples in Djoum and Mintom cultivate cocoa in parts of the tropical forest without felling trees, and instead densify their farms with fruit trees to increase forest canopy (plate 1) for carbon sequestration.



Plate 1: Agroforestry farming. The practice of agroforestry by indigenous peoples using cocoa plants and farm densification with fruit trees in Djoum area. A: Chief of Ando'o beside his nursery B: Focal Point of Lelewal Foundation using a vehicle to transport cocoa seedlings C: Chief of Minko'o II in his agroforestry farm C1: Planted mango tree (Photo credits: Photo A: by Enchaw G.B, 2018; Photo B: by Bouba N. A, 2017; Photos C and D: by Enchaw G.B, 2011)

They also practise tree domestication, reforestation and afforestation, using plants such as bush mango *Irvingia gabonensis*, Njangsang *Ricnodendron heudelotii*, Eru *Gnetum africanum* and Kola nut *Cola nictida*, which serve as local sources of food and income for them and Bantu local communities and to increase forest canopy for carbon removal from the atmosphere and mitigating climate change. In order to effectively and efficiently address specific societal challenges in the context of nature-based solutions, Lelewal Foundation also engaged the Baka, Bgyeli/Bakola and

Bedzang in self-reliant community water projects. The earliest of these projects were the two modern wells constructed in Ngorin for Mbororo pastoralists and in Minko'o II for Baka Pygmies in Djoum. Through these boreholes (plate 2), these indigenous communities could be supplied safe water throughout the year, particularly during the dry season when acute water crisis resulting from climate change worsens the daily burden of community members, particularly women and children, who have to trek long distances to get water of doubtful quality from springs and brooks.



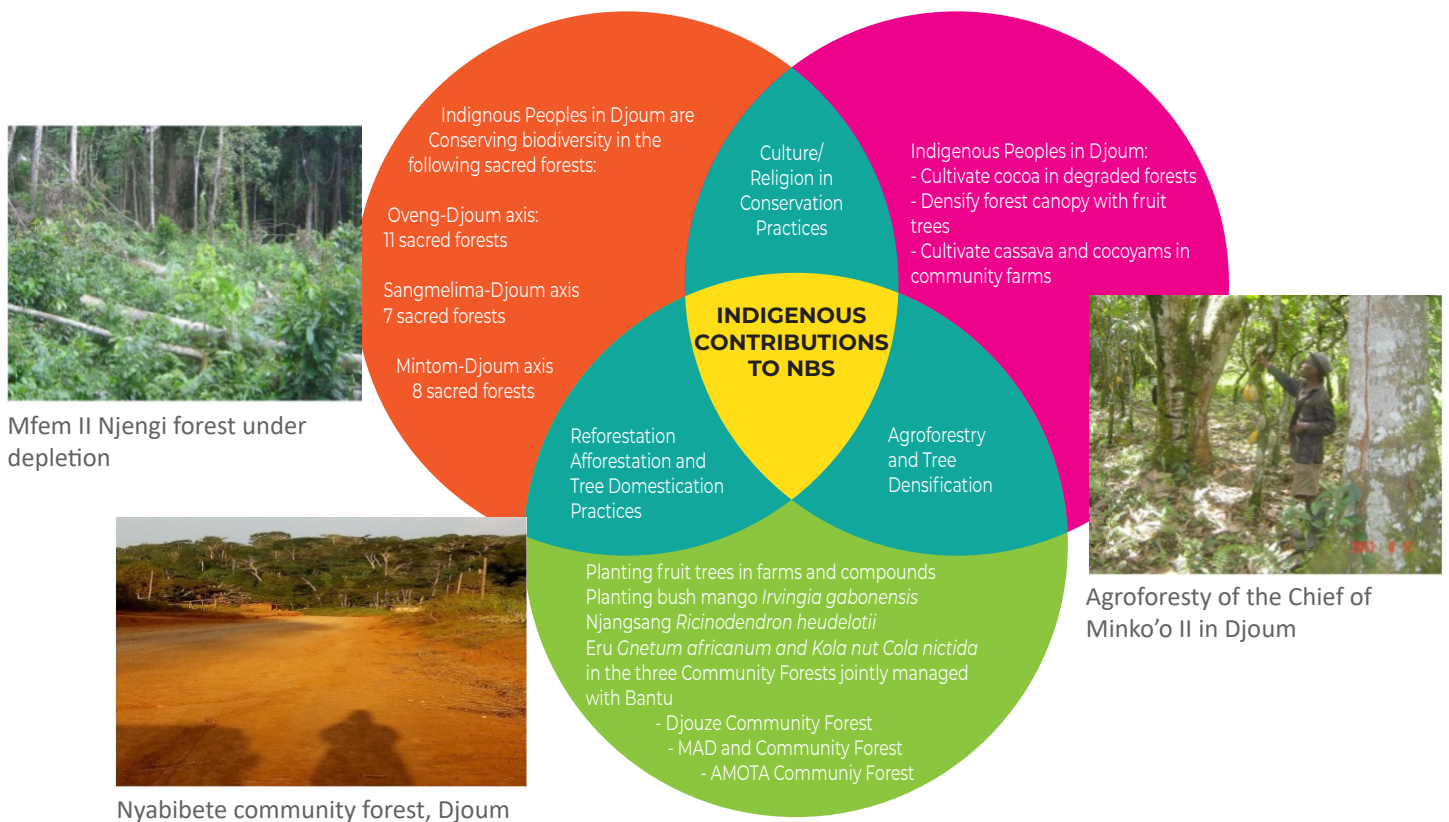
Plate 2: Boreholes. Water supplied to Minkoo and Ngorin communities. (Photo credits: Bouba Njobdji, 2018)

The hunter/gatherer Pygmies have learned to practise crop farming in the community farms of Nyabibete, Nveng, Miatta, Minkoo and Andoo and have started diversifying crops to include planting cocoa, fruit trees, plantains and cocoyams under the trees. The practice of crop farming has contributed not only to the food security of the Indigenous peoples but to biodiversity conservation that is being threatened by large logging companies. Climate change mitigation by planting cocoa and fruit trees to increase forest canopy improves ecosystems and creates carbon sinks to sequesterate more carbon. This will in the long run reduce the impacts of climate change. This has also contributed in reducing poverty, hunger and malnutrition in eleven Baka communities, as there is enough food for family consumption and surplus from their harvest is sold to complement other household needs and education of their children.

EVIDENCE-BASED CONTRIBUTIONS OF BAKA, BGYELI/BAKOLA AND BEDZANG IN NATURE-BASED SOLUTIONS TO CLIMATE CHANGE

Nature is the foundation of life for the Baka, Bgyeli/Bakola and Bedzang and all of what they do reflect nature. Information from phone survey and existing literature attest to the contributions of the Baka, Bgyeli/Bakola and Bedzang in nature-based solutions to climate change. Their evidence-based contributions abound in the southeast forest zone of Cameroon, particularly in Grand Djoum, which has a considerable concentration of resettled indigenous Baka communities along the three main road axes (DCDP, 2015). In these current sites, they still show proof of people of nature, and evidence for their contributions to nature-based solutions to climate change is drawn from three main domains, to wit: their culture/religion in conservation practices, their reforestation and tree domestication practices, and their agroforestry practices (Figure 3). These three domains are in line with the 2016 IUCN definition of NBS to climate change.

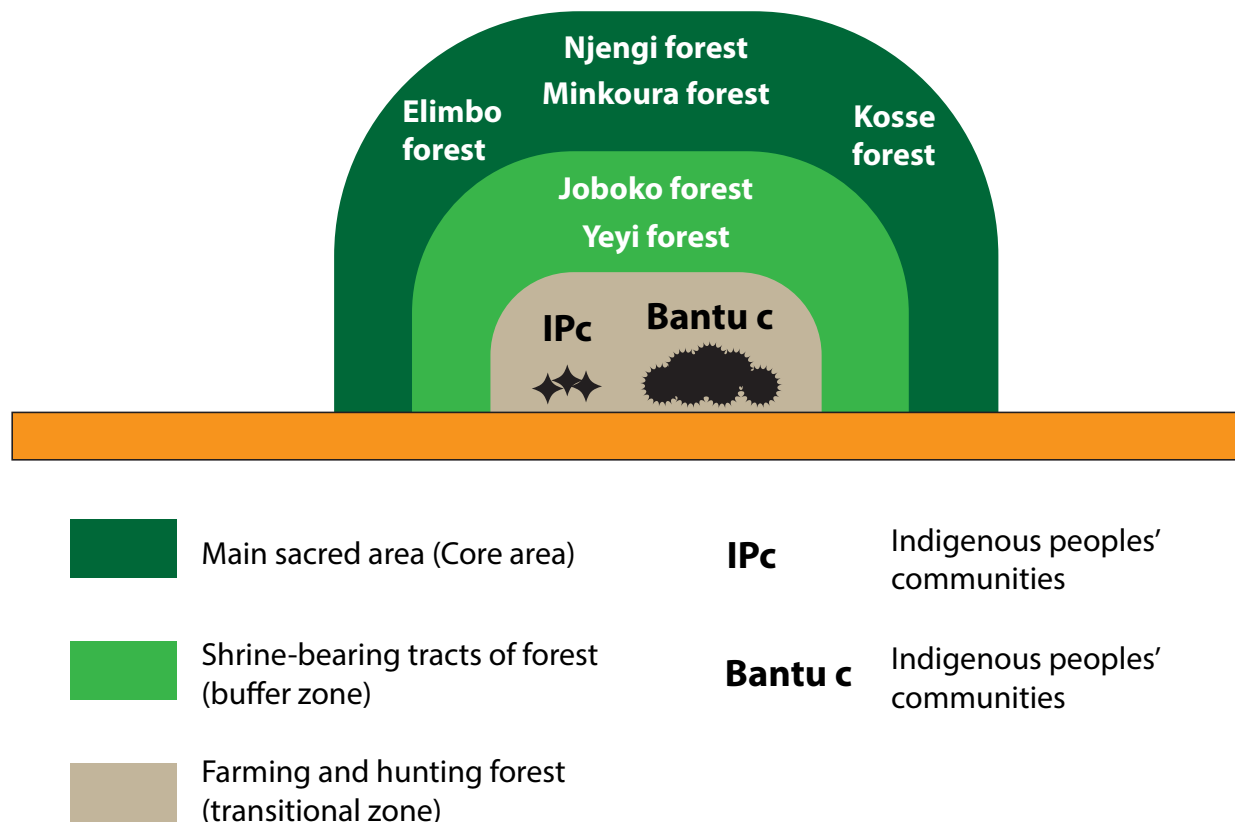
Figure 3: Indicators of Indigenous Contribution to NBS



Culture/religion in conservation practices

Among indigenous Baka, Bgyeli/Bakola and Bedzang, there is an inherent practice of using nature to source solutions to climate change and their livelihood through traditional forest governance. The practice of culture/religion in conservation remains inalienable in their current resettlement sites as it is a matter of necessity for every lineage head to have a sacred grove, no matter its size, in order to keep communing with the gods and sustain ancestral reverence. The number of lineage heads is an indication of the number of sacred groves in a community or groups of communities of the Baka, Bgyeli/Bakola and Bedzang. Some communities host both core and other sacred forests. The Njengi sacred forest serves as the core conservation area (*ndandai-eciti*), and the other smaller sacred forest massifs reserved for the other spirits of the forest such as Kossé, Elimbo, Yeyi, Joboko, Dohdi, Ngaje have their specific rites. This category of sacred forests reserved for the other spirits is concentrated in the traditional buffer zone called *parki-atiaciti* by the Baka, and the outermost area called *tinajoko* serves as the common zone used by every Baka for hunting and gathering (Enchaw and Njobdji, 2013). This is an indication that Baka had a traditional forest zoning approach analogous with the zoning of modern biosphere reserves⁷ (Figure 4) as established by UNESCO under Man and Biosphere (UNESCO, 2003).

Figure 4: Indigenous forest zoning in southeast forest of Cameroon



Njengi Sacred Forest is usually extensive, dense and obscure, with luxuriant carbon sinks that have high carbon sequestration potentials. Cultural and religious activities in such abodes of the Njengi include initiation of the young and divination rites accomplished by a chief priest assisted by all the other priests or lineage heads for the interest of a group of indigenous communities. Indigenous peoples in Djoum have one core sacred forest and many other sacred groves, which form a sort of network of sacred groves not only for cultural and religious purposes but also play an important role in carbon sequestration and serve as a resource depot (Lelewal FP, personal communication). This lineage head-associated network of sacred forests is not less in preserving biodiversity and sinking carbon for climate change mitigation than a network of parks and reserves, and it is in consonance with Criterion 3 of the IUCN Guidance Standards for using NBS.

Grey literature showed that biodiversity exploitation in the sacred forests belonging to the different forest spirits as well as the transitional or common use zone was regulated by taboos. For instance, hunting activities were regulated by prohibitive measures that barred hunting during periods when most of the species were reproducing. In addition, fragile or easily captured species such as the musk deer were only to be hunted by initiated elderly persons, and the consumption of great apes was simply prohibited (MINEF, 2003:25-29). Phone survey informants further explained that almost all huge trees, such as the tree of life called Baobab tree *Adansonia digitata*, the African King Tree, mahogany, ebony, obeche, dibetu, and sapelli, are still associated with particular spirits and abodes of the gods and were and are protected through a system of taboos by Indigenous peoples.

An informant in Mintom noted that the presence of sycamore fig tree or the African queen of trees has always been used as an indicator of hunting grounds, and it is a highly protected species among the Baka, Bagyeli/Bakola and Bedzang, since hunting is an integral part of their units of social life. This is probably linked to the fact that the tree forms an extraordinary ecosystem, producing several tons of fruits a year and feeding a greater variety of animals than any other kind of tree in Africa.

The informant intimated that many of the high value trees are often in sacred forests and harvesting of parts of such trees for medicinal purposes is possible only after certain rites have been performed and approved of by the divination spirits. Uninitiated indigenous men and women who violated the norms for access and entered sacred forests or used unauthorized tools therein usually got surreptitious punishment that ranged from getting missing in the forest to contracting an incapacitating illness that could lead to death if the offending party failed to subject himself or herself to an expensive ritual cleansing process in order to appease the gods of the forest. In other instances, material harvested from the forest in disproportionate quantities, which is indicative of unsustainable exploitation and/or sacrilege, was intercepted with an injunction for investigation (photo 3). All the sacred forests and the plants and animals in and around them were, therefore, protected *in situ* through the mystical and ritual sanctions that were elaborated (Ndelua Luc, personal communication). This forest governance approach of the Baka, Bagyeli/Bakola and Bedzang depicts sustainable management of unmodified ecosystems as nature-based solutions to climate change advocates.



Photo 3: Intercepted firewood. The placing of injunction on firewood harvested unsustainably using a peace plant in Kovifem forest near Kumbo. (Photo credit: Tatah Jean-Louis, 2018)

Another traditional conservation strategy of the Baka is based on totemism. Each lineage of the Baka, Bagyeli/Bakola and Bedzang is identified with a particular forest totem that is full of symbolism to the lineage. The totems helped them to identify some plants and herbs with medicinal potency. From the legends of the Bodawa lineage, monkeys aided them to escape danger that was coming through the forest by alerting them with a sharp sound. Bodawa cultural history is filled with stories of gorillas and chimpanzees helping old people and women carry heavy loads over long distances through the forest. Such a totem or animal was not killed or eaten by that lineage.

NBS IN NATIONALLY DETERMINED CONTRIBUTIONS STRATEGY

Nature-based solutions to climate change have become an indispensable pathway to contribute to the Paris Agreement hinged on climate change mitigation and adaptation. Cameroon, as is the case with many other sub-Saharan African countries, is already facing consequences of climate change, such as an abnormal recurrence of extreme weather phenomena characterized by violent winds, high temperatures, and heavy rainfall, which endanger the ecosystems on which local and indigenous communities depend and the services these provide. The consequences of climate change are undermining the effort Cameroon is making towards poverty reduction, development of a strong, diversified, and competitive economy, and strengthening national unity and consolidating the democratic process. Cameroon is particularly vulnerable to the challenges of climate change because of its expansion to the Sahelian zone, which is hit hard by desertification and its extension to coastal areas that are threatened by rising sea levels. Without focusing only on these extremes, it is obvious that all five agro-ecological zones in the country and all the sectors related to the economic and social well-being of the populations are affected in one way or another.

In response to these climate change challenges, Cameroon intends to use nature-based solutions as a framework as depicted in the Intended Nationally Determined Contributions. Its INDCs are partitioned into two, with the first part carrying mitigation strategies and the second part on adaptation strategies, each with the relevant institutions and actors. It is in this second part that women, vulnerable and Indigenous peoples feature in traces. The NBS framework as depicted in the INDCs constitute part of its Growth and Employment Strategy Paper, which has become the National Development Strategy (NDS-2020) to become an emergent country in 2035 through structural transformation and inclusive development. Earlier forest-related policies, such as Law N° 94/01 of January 20, 1994, rely on a generalized concept of sustainable forest management and do not identify the specific impact of climate change on Indigenous peoples so as to map out appropriate strategies for redress and collective achievement of climate change mitigation and adaptation. The strategies and recommendations made earlier only serve to improve understanding of Cameroon natural resources and add resilience to the natural systems in coping with anthropogenic stresses (Bele, Somorin, Sonwa, Nkem and Locatelli, 2011).

Cameroon signed the United Nations Framework Convention on Climate Change on 16 June 1992 and ratified it on 29 August 1994. It also signed the Kyoto Protocol on 23 July 2003 and is participating in the various negotiations of the UNFCCC geared towards climate change mitigation and adaptation. Here, reference is made to the overall national environmental policy and the dynamics generated by the potential establishment of the REDD+ mechanism, which existed only in its pilot phase (Kengoum and Tiani, 2013). With this ratification, the country promulgated Law N° 94/01 of 1994 to lay down forestry, wildlife and fisheries regulations, which provides for the involvement of local communities in forest resources management and conservation (Enchaw, 2020). The 1994 decentralized governmental reforms in the forestry sector is in harmony with the vision of the Paris Agreement within the framework of Nationally Determined Contributions to climate change.

The Paris Agreement, which is a legally binding international treaty on climate change, has come to engage all nations including Cameroon to the global climate-neutral effort and by compensating for the removal of carbon dioxide and other greenhouse gases from the atmosphere using natural or artificial processes. The Agreement was adopted by 196 Parties at the Conference of Parties 21 in Paris on 12 December 2015 and entered into force on 4 November 2016. It advocates for nations to “endeavour to limit” global temperatures to 1.5°C, reduce emissions to levels that will enable trees, soil and oceans to absorb greenhouse gases naturally, determine country level emission-reduction targets known as nationally determined contributions, and “climate finance” from rich nations to enable poorer countries to adapt to climate change and switch to renewable energy. The goals of this Agreement inspired IUCN to come up with an elaborate definition of Nature-based Solutions to climate change a few days later during its World Conservation Congress from 1-10 September 2016 in Honolulu in IUCN Resolution WCC-2016-Res-069-EN.

During COP21, Cameroon presented its Intended Nationally Determined Contributions, which reflected an integration of nature-based solutions (as defined in WCC-2016-Res-069-EN) in the sectoral policies and programs of the country (Mediaterre, 2015). It means that by ratifying the Paris Agreement, Cameroon is committed to include forest governance issues in national discussions via the Intended Nationally Determined Contributions, which subsequently becomes the Nationally Determined Contributions. The INDCs of Cameroon are hinged on the realities of the country characterized by huge forest, agricultural dependence, a diversity of agro-ecological zones, energy potentials and the country’s Vision 2035 of becoming an emergent country. The INDCs carry the emission-reduction targets set by the government, committing the country to reducing greenhouse gas (GHG) emissions to 32% by 2035, which is the emergent year. The gases concerned are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), emitted mainly from industrial and slash and burn farming activities; urban waste, and livestock night paddocks respectively.

The global objective is segmented into specific objectives articulated in five sections that reflect ambitious strategies of using NBS within the framework of the INDC. Section 1 focuses on society challenges and is geared towards poverty reduction, attaining the status of a middle income country, the status of Newly Industrialized Countries; agricultural revolution based on increased productivity and sustained economic growth with doubling of secondary sector activities to propel *Gross Domestic Product* from 19% to 38%. Section 2 is on climate change mitigation options with co-benefits, Section 3 on adaptation to reinforce country level resilience to climate change, Section 4 on strategies to attain the set objectives and Section 5 on funding, capacity building and technological transfer (GoC, 2015).

Climate change is now perceived as a major threat to achieving poverty reduction targets and Sustainable Development Goals (SDG) in many African countries including Cameroon. SDG 15 relates to forests, which cover 30% of the planet’s surface. These forests provide food security and shelter and are vital for combating climate change and protecting biodiversity and indigenous populations (Fern and Climate Analytics, 2018). Within the framework of climate change mitigation as section 2 captures, the 32% emission-reduction target in 2035 with 2010 as the reference baseline will be attained, using a complementary approach with 11% to be borne entirely and unconditionally by Cameroon effort and 21% to be achieved with support from the International Community through funding, capacity building and technological transfer.

The sectors earmarked for the climate change mitigation target include agriculture, livestock, fishery and forestry with the participation of local communities. The agricultural sector is intended to serve as the backbone of the emergence ambition, though its impact on depleting carbon sinks (deforestation and forest degradation) needs to be checked. In this regard, Cameroon land laws are tailored to encourage foreign investment in the country as they effectively clarified private property rights and made all unregistered land available for investment (USAID, 2016), with large-scale land acquisition for agriculture becoming unprecedented. National food self-sufficiency, food security, agro-industrial development and enhancement of productivity and competitiveness are to be guaranteed by the agricultural, livestock and fishery sectors although the approach may shun local and indigenous populations.

Cameroon counts on the forestry domain for climate change mitigation and co-benefits, and it has been proven that forest governance is very important for country level INDC (Fern and Climate Analytics, 2018). It targets sustainable management of forest to achieve 11% of its emission-reduction. This is and will be done through exploitation and valorization of productive forests within the framework of forest management plan as classified by Law N° 94/01 and as described in the Forest Convergence Plan by the Central African Forest Commission (COMIFAC).

Other specific actions include rehabilitating degraded lands, reforesting anthropic savanna zones, protecting and managing pasture lands and water points for animals, reinforcing carbon sinks in degraded forest areas, protecting and managing coastal areas against climate change, and restoring and managing mangroves. The intention is to mitigate climate change through these actions which fall within the framework of nature-based solutions and natural climate solutions. At the same time, the actions are a pathway to addressing social challenges and regulate abusive exploitation of the forest in order to enhance economic growth and combat poverty (COMIFAC, 2016). The INDC of Cameroon also earmarks actions such as allocation of part of forest royalties to local communities, employment creation, creation of council forests in permanent forest estate (PFE), creation of community forests in the non-permanent forest estate (NPFE), extensive conservation through a network of protected areas and adopting a land tenure system aligned with the zoning plans of the country (GoC, 2015) (table 2).

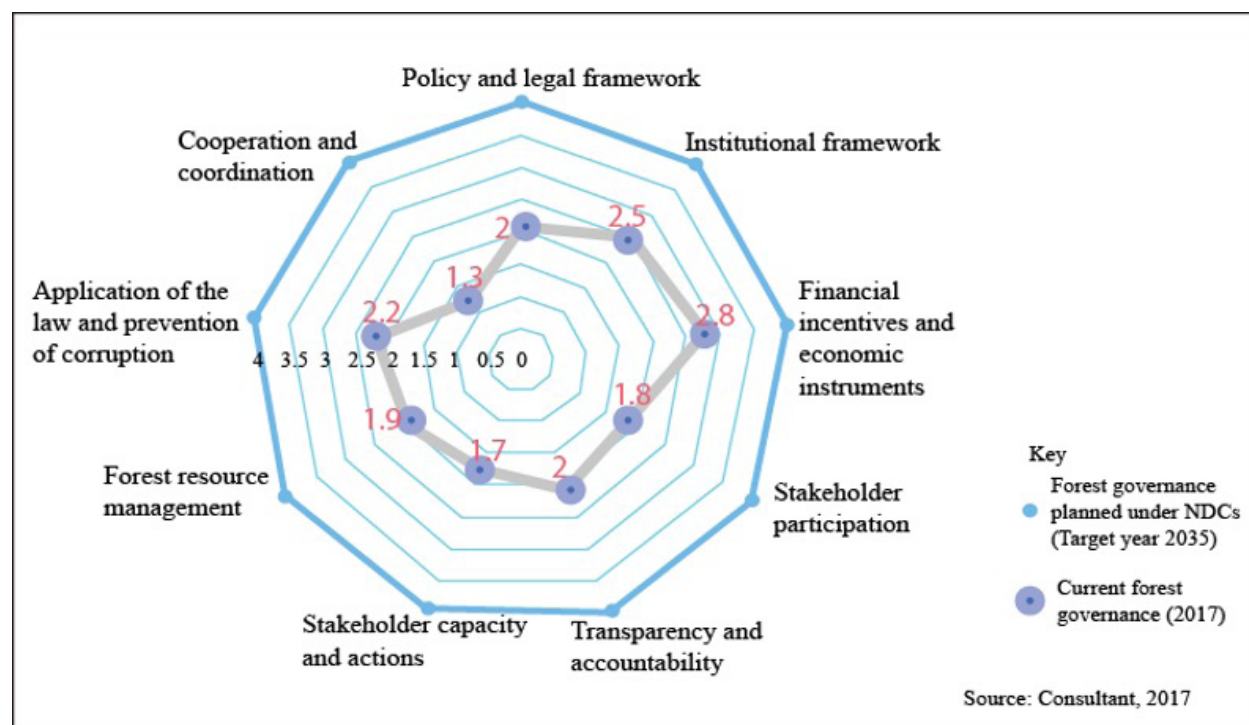
Table 2: Forest zoning system in Cameroon

National Forest Estate					
Permanent forest estate			Non-permanent forest estate		
Council forests	State Forests		Unclassified State forests	Community forests	Private forests
	Forest Reserves • Integral ecological reserves • Production forests • Recreation forests • Teaching and re-search forests • Plant life sanctuaries • Botanical gardens • Forest plantations	Protected Areas • National parks • Game reserves • Hunting areas • Wildlife sanctuaries • Buffer zones • Zoological gardens (public)			

Source: Forest Atlas of Cameroon, WRI 2011

The land tenure system provides an opportunity to share experience in the land use sector, which may inform implementation of the NDCs. For instance, experiences in the land use sector indicate that Cameroon is already facing enormous planning problems with many recorded cases of overlapping titles for logging and mining operations (WWF 2012). Issues of deforestation, land degradation and non-respect of reforestation and land rehabilitation remain critical in the country. In this regard, NDCs are becoming a key framework for steering national climate policies and provide a platform for emphasizing the importance of forest governance, in effect climate change discourse, particularly in a country such as Cameroon that implements a Voluntary Partnership Agreement (VPA)⁸ with the European Union. Whereas the VPAs relate to the forestry sector and aim to combat illegal logging, the NDCs have a wider scope and encompass not only the forestry sector but also other sectors such as transport, agriculture, waste, energy, industrial processes and product usage. They provide a variety of opportunities and mobilize a broader spectrum of national actors to address the challenges encountered in the land use sector (Fern and Climate Analytics, 2018).

The importance of forest governance to INDCs of Cameroon has been demonstrated by comparing its elements to features of good governance and recording the convergence or divergence using a scale from 0 to 4 (Fig. 5). Pertinent indicators in the forest governance sector include transparency, participation, coordination and accountability as they clearly show how the government of Cameroon is integrating nature-based solutions (as currently defined) to climate change in its sectoral policies and programs to guarantee sustainable forest management (GoC, 2009).

Figure 5: Prospective analysis of forest governance in Cameroon

Source: Adopted from Fern and Climate Analytics, 2018

The study carried out by Fern and Climate Analytics in 2018 showed a low score of 2/4 for transparency, indicating absence of transparency in the granting of permits for the agricultural, forestry and mining sectors. In addition, decision making is not transparent as very few potentially affected communities are involved in the decision making process or receive information on the decision taken. Although the INDCs indicate co-design and co-implementation of decisions concerning agriculture, livestock, fishery and forestry, participation of local communities as key stakeholders in forest governance scored 1.8/4. Local and indigenous community representatives seldom participate in decision making processes concerning granting of forest exploitation permits, use of forest areas, development of forest areas and changes in allocation of forest areas for farming and mining activities.

Even when local and indigenous community representatives participate in decision making processes, they are often used for assistencialism⁹ purposes as their opinions seldom count. Institutional coordination in land and forest governance is “poor”, with an average score of 1.3/4. The coordination mechanism is riddled with issues of mandate, clarity about who has responsibility, and capacity, and some inter-agency platforms or committees within the government do not wholly fulfil their remit (Fern and Climate Analytics, 2018). Though appropriate institutional accountability from design of planning, finance and management activities to outcomes and impact evaluations is necessary at all levels, government actors do not always consult local communities to ensure their concerns are taken into account in the development of the available forest cover.

Consultation with and accountability towards women and Indigenous peoples is also limited. The government approach of not consulting them and/or their ministry in issues of forest governance has also contaminated some researchers when carrying out scientific studies. For instance, authors of a study on the role of forests and governance in Cameroon's NDC to the Paris Climate Agreement in 2018 are no exception. Fern and Climate Analytics consulted only the Ministries of Agriculture and Rural Development, Environment, Nature Protection and Sustainable Development, Forestry and Wildlife and Mines, Industry and Technological Development. They also consulted Cameroon Organization for Forests and Rural Development (FODER) and Cameroon Centre for Environmental Information and Sustainable Development (CIEDD). They neither consulted the Ministry of Social Affairs, which is in charge of Indigenous peoples, nor Indigenous peoples organizations. All these forest governance challenges negatively impact current emission reduction effort for climate change mitigation.

That notwithstanding, Cameroon conceived its INDC scenario by drawing inspiration from the reference sectoral emissions scenario of 2010 as reflected in 2017 in order to estimate possible future reductions ensuing from Sectoral Actions relating to agriculture, forestry, waste, transport and energy where a total electrical energy package of 25% is derived from micro-hydro energy (11%), biomass energy (7%), solar panels PV (6%) and wind power (1%) in 2035. With the country still grappling with Intended Nationally Determined Contributions, which at world level became Nationally Determined Contributions in 2016 after ratification of the Paris Agreement, effort has to made to come up with the NDC through revision. The revision effort was confirmed during an interview with the National Designated Authority/Focal Point for Green Climate Fund and Secretary General of the Ministry of Environment, Protection of Nature and Sustainable Development who attested that the INDCs are currently being revised to scale them up to Nationally Determined Contributions before the next Conference of Parties (COP 26) in Glasgow, UK (Prof. Tchawa Paul, personal communication).

Adaptation to climate change within the framework of nature-based solutions as captured by the INDCs is quite on course though more attention is being given to mitigation. From a policy standpoint of adaptation to climate change, Decree 2011/2582/PM of 23 August 2011 on rules for the protection of the atmosphere specifies in its annex that activities such as "forest exploitation and wood preparation," the "sawmills" and the "wood preservation industries" shall be subject to a permit. This legal document has not yet entered into force due to the absence of an application decree, and thus the fight against climate change still falls under the 1996 framework law on environmental protection (Kengoum and Tiani, 2013). An interviewee indicated that by 10 December 2009, the government created the National Observatory on Climate Change and validated a National Climate Change Adaptation Plan (NAPCC) in June 2015 (Prof. Amougou Joseph A,¹⁰ personal communication). In 2016, within the framework of strengthening their partnership for effective fundraising for the NAPCC implementation, [MINEPDED](#) and Global Water Partnership (GWP) Cameroon initiated a process of developing a National Investment Plan for Adaptation to Climate Change (NIPACC) (Kengoum and Tiani, 2013).

The National Adaptation Plan for Climate Change was created to assist the Cameroonian people in facing this important challenge and carries an evolution of climate in the 5 agro-ecological zones in the country. It also contains a sectoral and geographic evaluation of climate sensitivity, vulnerability to climate change and resilience. The sectors most concerned with adaptation are

agriculture, livestock and fisheries, and urban resilience. In response an intervention strategy for 2016-2025 and a 5-year action plan for 2016-2020 with 20 specific project details was designed in two main categories. The first category projects are those from 1-5 and consist of transversal projects while those of the second category are from 6-20 and are sectoral projects. The lead ministry for the transversal projects is the Ministry of Economy, Planning and Regional Development while the other relevant ministries will mainstream climate change adaptation across sectoral programs depending on their respective competences.

The intervention projects in the domain of agriculture, livestock and fishery for climate change adaptation were outlined in the Intended Nationally Determined Contributions and falls within the scope of nature-based solutions to climate change and natural climate solutions with the involvement of local communities. In a bid to enable Cameroonians to adapt adequately to climate change, the government will sensitize the populations on the impact of climate change, educate and build their capacity to anticipate the impact of climate change and enhance their resilience. School curriculum will be developed to build the capacities of learners in climate change adaptation strategies by using appropriate pedagogic tools, award of bursaries for research, specialized training and refresher programs. The government will develop a system of managing environmental education by coordinating the activities of the National Observatory of Climate Change and the National Observatory of Risk so they can adequately carry out forecasts of meteorological events and the impact of climate change (MINEPAT, 2017). The government also intends to create a network for observation and monitoring of the national coastline in a bid to identify zones prone to coastal erosion and to establish a relationship between climate and coastal erosion (GoC, 2016).

Another adaptation intervention of the government is to reinforce the resilience of agricultural practices of women, youths, aged persons, autochthons and local farmers by introducing new rotatory farming techniques in order to intensify and sustain production systems. If the autochthons are considered here to be Indigenous peoples, it will be very difficult for them to engage. The government intends to develop integrated agriculture that is resilient to the effects of climate change through space management, the use of appropriate agronomic and agricultural intensification techniques as well as managing water resources to satisfy the needs of farmers. Issues of managing water pollution and agricultural and industrial pollution as well as preventing extreme climatic events such as floods and drought constitute part of the adaptation interventions. Cameroon will carry out inventories, manage and conserve forest massifs, reconstitute forest cover particularly around catchment areas to sustain natural water flow, enhance agroforestry in villages and valorize organic waste from households, agriculture and livestock through *in situ* transformation.

This document also indicates that the government will conserve aquatic biodiversity and soils, manage bushfires through surveillance and monitoring and the trafficking of wildlife and poaching. Access to resources such as land and the role of women as land stewards will also be addressed for them to adapt to climate change adequately. The government will increase green spaces in urban areas to help urban populations adapt to the effects of climate change. Also, land tenure governance will be ameliorated in response to climate change (GoC, 2016).

In the domain of livestock, the government intends to reduce livestock vulnerability to climate change by using adaptation strategies. The specific interventions include management of pasture and pasture lands, animal drinking points, improving crop rotation farming and water production from boreholes. For the fishery sector, among adaptation strategies are fishpond development, cultivating fish species and using fishing infrastructure that are resilient to climate change. In the energy domain, the strategies are sustainable management of fuel wood energy; construction, distribution and use of improved cook stoves; and development of biofuel plantations, among others. For the tourism industry, the government intends to develop eco-friendly touristic sites and use climate change-resilient infrastructure through artisanal exploitation and use of natural resources adapted to climate change. Industrial development will be adapted to renewable sources of energy to check GHG emission and industrial pollution (GoC, 2016).

ENGAGING INDIGENOUS PEOPLES IN LOCAL/NATIONAL NBS DISCUSSIONS

The engagement of Indigenous peoples in discussions on nature-based solutions to climate change in Cameroon is still very poor. With the popularization of the concept of NBS in 2016 through its definition by IUCN and the signing of the Paris Agreement that advocates including forest governance issues in national discussions via the INDCs, hopes were high that the historical inadequacies of excluding Cameroon Indigenous peoples from forest conservation would be bridged. Despite the opportunity offered, past scenarios keep replicating with incessant deferment of engaging Indigenous peoples in NBS discussions at the local/national government level. The engagement of Indigenous peoples with the government is vague, particularly concerning climate change, REDD+, Green Climate Fund, Nationally Determined Contributions to the Paris Agreement and nature-based solutions to climate change. During a study on the GCF in 2018, the then National Designated Authority/Focal Point for GCF was sincere that the government was yet to engage Indigenous peoples with respect to GCF (Mr Wagnoun Tchonkap Valentin, personal communication).

Since then, the situation has not evolved and from existing literature, the non-engagement is associated with a number of ideological, structural and socio-political challenges. The government of Cameroon, as is the case with many Francophone African countries, believes that all Cameroonians are indigenous in the country and no particular group should be identified as such, though the Preamble of the Constitution of Cameroon makes mention of indigenous and minority peoples but with reference to no particular groups. The authority holds that structural and legal challenges stifle recognition of Indigenous peoples and their land rights in Cameroon as succinctly captured by Cameroon's delegate (PM Joseph Dion Ngute) to the Regional Sensitization Seminar on the Rights of Indigenous Populations/Communities in Central Africa in Yaoundé in September 2006. The delegate noted that these challenges have to be overcome before Baka, Bakola/Bagyéli and Bedzang's land rights can be recognized (ACHPR, 2006:14 and GoC, 2009).

The institutional structure vis-à-vis engagement of Indigenous peoples in nature-based solutions to climate change in Cameroon remains critical. The Ministry of Social Affairs that addresses issues of Indigenous peoples is not directly involved with forest governance, climate change and climate financing. Literature on government programs indicates that MINAS is not among those ministries mandated to implement the Cameroon Forest Investment Plan, REDD+ and to carry out discussions on nature-based solutions to climate change at country level. According to the FIP Final Report of 11 November 2017, the National Implementing Agency is the Ministry of Environment, Protection of Nature and Sustainable Development and the co-implementing agencies are the Ministry of Forestry and Wildlife, Ministry of Economy, Planning and Regional Development, Ministry of Agriculture and Rural Development, Ministry of Livestock, Fisheries and Animal Industries, and the Prime Minister's Office. The same applies to the Central African Forest Initiative Multi-Partner Trust Fund. In this particular case, the four Implementing Partners are:

- Ministry of Economy, Planning and Regional Development assigned to piloting cooperation agreements, signing of contractual arrangements related to external funding and overall supervisory role in execution of all externally funded projects;
- Ministry of Finance charged with lodging and putting at the disposal of concerned technical ministries (MINEPDED/MINFOF) the finances to execute activities;
- Ministry of Environment, Protection of Nature and Sustainable Development assigned with technical and administrative competence in the domain of Climate Change and REDD+;
- Ministry of Forestry and Wildlife assigned with technical competence in the forest sector and REDD+.

A similar scenario is observed with the Intended Nationally Determined Contributions which involves nine frontline State institutions for discussions on nature-based solutions to climate change without the tutelary ministry for Indigenous peoples. They include the Ministries of Environment, Protection of Nature and Sustainable Development; Forestry and Wildlife; Agriculture and Rural Development; Livestock, Fisheries and Animal Husbandry; Territorial Administration and Decentralization; Water and Energy; Housing and Urban Development; Transport and the Special Council Support Fund for Mutual Assistance (FEICOM), which is on course to become the first Accredited Entity in Cameroon. This is indicative of the fact that the institutional structure and policy framework in Cameroon are insensitive to the engagement of Indigenous peoples in climate financing, the Green Climate Fund in general, and co-design and co-implementation of nature-based solutions to climate change for co-benefits in particular.

The government has imposed a moratorium on the creation of villages, which has impeded the recognition of indigenous villages as legal entities and their traditional authorities as auxiliaries of the administration. Statutorily, villages are considered as legal entities and the traditional leaders of these villages have been classified into 1st, 2nd and 3rd classes in order of hierarchy (Article 2 of Decree No 77/245 of July 15, 1977). These traditional authorities are recognized as auxiliaries of the administration while those of forest Indigenous peoples (Pygmies) are not. The implication is that service delivery or anything to be done to those who have self-identified as indigenous in Cameroon, in accordance with Article 3 of the UN Declaration on the Rights of Indigenous Peoples, must of necessity be channeled through the Bantu local communities (Gbabandi Platform, Okani and FPP, 2019). Communities of forest Indigenous peoples (Pygmies) have been subsumed under

Bantu villages/authorities after eviction from their ancestral lands. At the institutional level, Indigenous peoples in Cameroon are considered under categories such as minority and vulnerable groups, and therefore are placed under the tutelage of the Ministry of Social Affairs rather than the Ministry of Environment, Protection of Nature and Sustainable Development. This is probably the reason for which the GCF National Designated Authority/Focal Point is yet to engage Indigenous peoples with respect to GCF (Mr Wagnoun Tchonkap Valentin, personal communication).

This underpinning philosophy of the government on indigeneity and Indigenous peoples in Cameroon undermines their engagement in consultations, policy design and implementation. For instance, the 2008 Readiness Plan Idea Note (R-PIN) for Cameroon, which was drafted by the defunct Ministry of Environment and Forestry, World Wildlife Fund and Open Networking Foundation International neither incorporated the national civil society that works with Indigenous peoples nor Indigenous peoples themselves and local communities. After signing and ratifying the Kyoto Protocol on 28 August 2002 and engaging in REDD+ negotiations in 2005, the Cameroon R-PIN (2008) and the Readiness Preparation Proposal (R-PP) in 2012 were among the early policy documents through which the government expressed its readiness to commit itself in the global climate change mitigation and adaptation endeavor. The exclusion of Indigenous peoples at this very beginning, as captured by these early policy documents that are related to the Forest Carbon Partnership Facility (FCPF), REDD+, forestry, deforestation and forest monitoring, set a fragile foundation for any subsequent engagement of Cameroon forest stewards in climate change-related agenda.

A dichotomy persists between the government policy of who should be an actor in the domain of forest management and the goodwill of some State officials who feel that inclusivity is cause and cost effective in addressing issues of climate change, REDD+, NDCs and nature-based solutions to climate change. The then government focal point for the UNFCCC and FCPF at MINEPDED affirmed that “it is unthinkable to do REDD without involving local populations.” The involvement of local populations does not necessarily imply involvement of Indigenous peoples following the socio-political cleavage imposed on Bantu local communities and indigenous Baka, Bagyeli/Bakola and Bedzang.

The contemporary non-engagement of Indigenous peoples in discussions on nature-based solutions to climate change in Cameroon is actually “a prophesy” come true. An expert reviewer of climate change legislation for 99 countries observed in the case of Cameroon that the World Bank as the lead Multilateral Development Bank did not follow its own basic safeguard standards on meaningful prior consultation and involvement of Indigenous peoples and forest dwellers. Although a good number of highly qualified persons were consulted, they were not necessarily the right people (Nachmany et al 2015 and FAPI; Bouba & Enchaw et al, 2019). The same expert assessment found that “Not enough local NGOs and civil society groups appear to have been involved.” Furthermore, the expert reviewer warned that “a failure to include the Pygmy (Baka, Bagyeli/Bakola and Bedzang) communities early on in REDD consultations and planning might result in extensive human rights violations during REDD implementation in their territories.” Though the R-PIN gave a list of the “main preoccupations of native populations dependent on the forest,” it does not contain any specific plans for consultation with Indigenous peoples and forest dependent communities.

The same scenario replicated in the case of the Intended Nationally Determined Contributions, which is the pathway to nature-based solutions to climate change. The Baka, Bagyeli/Bakola and Bedzang were not consulted before the drafting of the INDC nor for their input into the NDC version (Prof. Tchawa Paul, 7/9/2021, personal communication). That notwithstanding, during a workshop organized in January 2018 by the African Indigenous Women Organization Central African Network (AIWO-CAN), indigenous organizations created the Platform for REDD+ and Indigenous Peoples of Cameroon (PREPAC) through which they could better participate in the REDD+ process with AIWO-CAN as the lead organization (IWGIA, 2019) if they can actually engage Indigenous peoples.

For adequate engagement of the Baka, Bagyeli/Bakola and Bedzang in discussions on NBS at the local/national level, an enabling structural and legal environment needs to be created first. Such an environment will create avenues for engaging these Indigenous peoples easily, as depicted below.

- i) The issue of indigeneity should be addressed. Those groups of persons in Cameroon who have self-identified as indigenous should be recognized by the government and an enabling environment created to check stigmatization and marginalization. The capacity of the Baka, Bagyeli/Bakola and Bedzang to engage with the NDA and GCF for funding needs to be enhanced and their knowledge of climate policies, measures and nature-based solutions should be improved through capacity building.
- ii) Their communities should be recognized as administrative entities and their authorities conferred the status of auxiliaries of the administration. These two elements will enhance direct engagement in any discussions. So long as Baka, Bagyeli/Bakola and Bedzang remain under the guardianship of local communities, engaging them directly remains quite challenging.
- iii) Indigenous peoples in Cameroon should be placed under the Ministry of Environment, Protection of Nature and Sustainable Development so that they become an integral part of the body steering issues of climate change, REDD+, GCF, FCPF and nature-based solutions to climate change. As direct impact stakeholders, the NDA/Focal Point could easily engage them in discussions on climate change awareness, impact, policies, funding, mitigation and adaptation. By placing them under the Ministry of Social Affairs, they are dissociated from the center of activities, whereas they are most impacted by climate change and own invaluable indigenous knowledge for climate change mitigation and adaptation. As of now, neither MINEPDED nor MINAS has developed positive and open attitude towards the Baka, Bagyeli/Bakola and Bedzang in issues of climate change mitigation and adaptation, REDD+, GCF, FCPF and nature-based solutions, and they are not to blame.
- iv) Workshops organized by civil society organizations for sensitization, education, consultation and designing of projects attuned to climate change mitigation and adaptation should be hosted close to the communities of Indigenous peoples to increase their chances of participation. Many of these Indigenous peoples, particularly women, seldom own identification papers such as birth certificates and national identity cards which could permit them to move out of their communities.

When the host venues for such workshops are far off, racketeers and impostors easily take advantage of Indigenous peoples (Oyono et al., 2007). This racketeering phenomenon has permeated many CSOs and they have not just hijacked and commercialized the indigeneity issue in Cameroon but have used their political influence to shun those CSOs working effectively with Indigenous peoples on the ground from gaining visibility. The poverty situations of Indigenous peoples remain appalling with limited chances of affording transport fares to Yaounde. Some of the workshops are organized deliberately where Indigenous peoples cannot not easily attend and to the exclusion of CSOs working with them. Not all CSOs know that Pygmies are predisposed to stigmatization and cannot really give their free, prior and informed consent when in the presence of Bantu and Bantu Chiefs.

- v) Besides formal workshops, informal gatherings commonly called multilevel and multis-takeholder interactions make CSOs very suitable for consultations with indigenous men and women, something that is quite difficult to do by the government.

NBS APPROACHES THAT RESPOND TO INDIGENOUS PEOPLES' RIGHTS

Issues of Indigenous peoples' rights are quite peculiar in Cameroon, particularly as information about them is gotten from Bantu and their local chiefs. Some researchers have fallen prey to this phenomenon of misguided information sourcing (Schmidt-Soltau, 2009 and Enchaw, 2019). Only windows such as approaches to NBS may influence remediation since it covers both the forestry and other sectors such as agriculture, land, transport, waste, energy, industrial processes and product usage. Though the Paris Agreement created opportunities for discussions on nature-based solutions to climate change to be carried out at local/national level within the framework of NDCs, the government is yet to put in place an enabling environment to redress the rights of indigenous Baka, Bagyeli/Bakola and Bedzang. It creates no link between forest governance and the NDC, and between Indigenous peoples and climate change mitigation in country level INDC; and co-design and co-implementation of solution-based projects fall short of rights enhancement vis-a-vis existential, human, land, socio-economic and political rights of forest Indigenous peoples. In their current resettlement sites, Indigenous peoples are devoid of customary and statutory land rights and are most predisposed to the adverse effects of climate change. Their invaluable indigenous knowledge of ecosystem protection, restoration and sustainable management is not harnessed for climate change mitigation and adaptation.

Rights enhancement-based NBS approach

Rights enhancement-based approach to NBS *will provide a window for a policy shift in Cameroon in relation to intercommunity dialogue for Indigenous peoples to gain customary land rights without an arbiter. Cameroon identified consultations as an important first step to understanding how climate change legislation that works for co-benefits could be developed bottom up. With broad-based and inclusive consultations carried out close to the localities of Indigenous peoples, the chances of the Baka, Bagyeli/Bakola and Bedzang participating in such consultations will be increased to adequately capture their concerns, particularly those related to:*

- i) Community recognition as legal entities
- ii) Conferring of the status of auxiliaries of the administration to their authorities
- iii) Reinstating the 10% forestry royalties for local communities with legal provisions for indigenous communities to become direct beneficiaries

In 2012, a ministerial order No.0076/MINADT/MINFI/MINFOF of 26 June 2012 allocated 10% of forestry royalties to local communities in forest exploitation areas. Forest indigenous peoples, Baka, Bagyeli/Bakola and Bedzang, never received such benefits up to 2015 when the order was repealed by circular No 004/MINFI/DGI/L of June 2015 in conformity with tax provisions of Law No 2014/026 of 23 December 2014 relating to the 2015 finance law of Cameroon. This denial of their rights must have been in connection with Decree No 77/245 of July 15, 1977 recognizing village communities as administrative units. By not being recognized by law as such, Baka, Bagyeli/Bakola and Bedzang were excluded from not only the forestry royalties but also from other compensations, alternative livelihood activities and development projects promised by forestry authorities.

- iv) Importance of securing their rights and access to land, territories and resources in achieving nature-based solutions to climate change through the use of their invaluable indigenous knowledge of creating networks of sacred forests not only for socio-cultural and religious purposes but also for ecosystem protection, restoration and sustainable management to restore harmony with nature and all life forms in partnership with states, donors, civil society organizations and others.

- v) Advocacy and lobby

With well-coordinated advocacy and lobby with local administrative and council officials, members of parliament and senate, inter-community dialogue between the Baka, Bagyeli/Bakola and Bedzang and Bantu and their Chiefs, more participatory mapped land with customary land certificates will be granted to these Indigenous peoples and will check their marginalization and conflicts (DCDP 2015, table 58:187). Land/forest allotment to Baka, Bagyeli/Bakola and Bedzang within forest management units in which logging activities are ended will enhance community governance, such as expansion of cultural forests, land for agroforestry, apiculture and crop production for food security, poverty alleviation and biodiversity conservation. Gazetting the sacred forests, which constitute the abodes of Njengi, Minkoura, Elimbo, Kosse, Joboko and Yeyi gods, as community reserves will scale up environmental stewardship (culture and religion in conservation) for climate change mitigation.

The introduction of community-managed areas (community forests and ZICGCS) was one of the major changes in forest governance that was heralded in Cameroon by Law N°. 94/01 of January 20, 1994. The application of this law is governed by Decree No.95/531 of 23 August 1995 and Ministerial Decree No. 0518 of December 21, 2001. Community forestry as a mechanism for involving local and indigenous people in forestry management came as a realization that government alone cannot sustainably manage forest and forest-based resources (Ngo, 2011). According to the 1994 law, a community forest is a portion of the non-permanent forest estate, which is free from all types of exploitation, has a maximum area of 5,000 hectares, and its management is granted to a village community by the State.

The clause “the State grants its management to a village community” outrightly precludes indigenous communities from community forestry, since they are not recognized by the State. The State retains ownership of the land but grants the management of the forest resources to the said community for a period of 25 years (this period can be renewed). The agreement reached between the State and the beneficiary community is accompanied by a ‘Simple Management Plan’ (SMP) and all activities carried out in the community forest must comply with this plan (MINEF, 1998). These forests are created at the request of communities (Ngo, 2011). If the 1994 law, which is under review, could provide for community forests to indigenous communities, it will enhance their rights and scale up indigenous contribution to climate change mitigation within the framework of nature-based solutions to climate change.

Endnotes

- 1 Government of Republic Cameroon.
- 2 The physical process through which man changes the levels of [greenhouse gases](#) in the atmosphere.
- 3 Commonly known as unités d'aménagements forestières (UFAs).
- 4 The interviewees included the National Designated Authority/Focal Point and Inspector Number 1 in the Ministry of Environment, Protection of Nature and Sustainable Development, Inspector Number 2 in the Ministry of Social Affairs, and the Director of the National Observatory on Climate Change in Yaounde. The phone survey interviewees were the Focal Point of Lelewal Foundation, the Baka Chief of Minko'o II, Baka and an elderly woman (kobo) in Djoum, the Baka Counsellor in Mintom, two ladies in Koudoukoudoum and Nyamabande villages near Campo Ma'an National Park and the Lady President of Youths In Alternative Action Association (YIAA) in Bamenda, North West Region of Cameroon.
- 5 This is a principle within the United Nations Framework Convention on Climate Change (UNFCCC) sometimes with the addition of the phrase 'and respective capabilities' (CBDR-RC) that acknowledges the different capabilities and differing responsibilities of individual countries in addressing climate change.
- 6 Using remote sensing and satellite technologies assisted by computers for environmental monitoring (Park, 2001:19).
- 7 Zoning into core area, buffer zone and transitional zone with all of them being privileged places for man and nature (UNESCO, 2003:16-17).
- 8 A Forest Law Enforcement, Governance and Trade Voluntary Partnership Agreement (FLEGT VPA) is a bilateral international agreement between the EU and a timber-exporting country. It aims to improve the country's forest governance and ensure that timber imported into the EU meets all the legal requirements of the partner country.
- 9 This is a situation where the local population is just made to assist the experts and decision makers to achieve their objective instead of participating in the conservation of their resource base for their welfare.
- 10 The Director of the National Observatory on Climate Change (ONACC).

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Synthesis: Nature-based Solutions in Community Life Systems in Nicaragua and Bolivia

By Center for the Autonomy and Development of Indigenous Peoples

INTRODUCTION

More than 150 years ago, with the industrial revolution, climate change was discovered. The activities carried out by industries, such as the exploitation of natural resources and pollution of air and water sources, were responsible for the increase in greenhouse gases and with this the increase in the temperature of the earth.

In recent years, discussions about climate change have echoed around the world not only in academic spaces but also among celebrities in the entertainment world such as Leonardo DiCaprio who have joined the voices denouncing its effects and risk to humanity.

Over the years, the focus has been on reducing carbon emissions, optimizing resources, recycling, and even individual actions like reusing materials, among others. Currently at the international level, strategies known as nature-based solutions (NBS) are implemented, which the World Wide Fund for Nature (WWF) defines as “a set of actions or policies that harness the power of nature to address some of our most pressing social challenges, such as the threat of water availability, the increasing risk of natural disasters or climate change.”

However, long before all this, Indigenous peoples have had ancestral practices in their way of living in harmony with the environment, which could be the key in the fight against global warming.

The Center for the Autonomy and Development of Indigenous Peoples (CADPI) conducted case studies on nature-based solutions in two indigenous communities in Nicaragua and Bolivia, one on the shores of the Caribbean Sea in Central America and the other located in the Amazon rainforest in South America. These communities are Karatá and San Miguel de Bala, respectively.

The study aims to demonstrate how Indigenous peoples contribute through their ways of life, based on traditional knowledge, to solutions based on nature through the management of their lands, territories and resources. At the same time, it determines how governments integrate nature-based solutions into their policies and programs. The study also defines what elements and components constitute NBS from the perspective of Indigenous peoples. And finally, it presents recommendations on how Indigenous peoples can incorporate nature-based solutions in global and national discussions based on their local practices.

The two communities participated in carrying out the study. The study, which is descriptive and cross-sectional, applied a comprehensive and interdisciplinary methodology. Secondary information was also used, such as publications, among other documents related to the research areas.

SOCIODEMOGRAPHIC CONTEXT OF STUDY AREA

Although Nicaragua and Bolivia are more than 4,000 kilometers apart, they have many similarities. Both countries are multicultural and multiethnic and recognize in their legal frameworks not only Indigenous peoples but also their right to self-determination for their development.

These two countries also have marked differences as in their geography. Nicaragua has the Pacific Ocean to the west and the Caribbean Sea to the east. On the other hand, Bolivia has sought in international courts to regain sovereign access to the Pacific Ocean.

Nicaragua, in the center of America

Nicaragua has 15 departments and two autonomous regions. Geographically, the country is divided into three regions: Pacific, with a high ecological risk and high population density with 152 inhabitants per square kilometer; Central North, predominantly rural with an agricultural economy, limited road development and a density of 48 inhabitants/km²; and the Caribbean Coast, mostly rural and jungle, with a low population density (10 inhabitants/km²), a larger indigenous population, low schooling rates, limited road access and disconnection from the rest of the country even though it occupies 46% of the territory (Ortega S. 2009).

According to projections of the National Institute of Development Information (INIDE), the population estimate for Nicaragua for 2020 is 6,518,478 inhabitants, of which 51% are women and 49% are male. Of the total population, 56% reside in urban areas and the remaining 44% in rural areas.

The Constitution of Nicaragua recognizes six ethnic groups: Miskitus, Mayangnas, Rama, Creole, Garífuna and Mestizos.

The Autonomous Region of the North Caribbean Coast (RACCN) is located in the Northeast part of Nicaragua, being the largest territorial portion of the Caribbean Coast. This region is bordered on the north by the Republic of Honduras with the Wankí or Coco River serving as an international border, on the west by the departments of Jinotega and Matagalpa, on the south by the Autonomous Region of the South Caribbean Coast demarcated by the Rio Grande de Matagalpa, and on the east by the Caribbean Sea.

The RACCN has a surface area of 32,127.28 square kilometers, the largest in the country, comprising 26.3% of the national territory. Its regional administrative headquarters are located in the city of Bilwi in the municipality of Puerto Cabezas.

In Bilwi is the indigenous and Afro-descendant territory of Karatá, with a territorial extension of 37,471 square hectares. Bilwi is made up of five indigenous communities: Karata, Lamlaya, Dakban, Wiwas and the city of Bilwi, occupying 80% of the headquarters of the Regional Government of the North Caribbean Coast. In the community of Karatá, a community with a lagoon of the same name, is where the case study was carried out.

The lagoons are of strategic importance for the region, since they are a source of food for essential different species such as shrimp, lobster and fish vital for the economic sustainability of the communities. There are also other species with less economic potential, which serve to preserve the ecosystem, and species in danger of extinction, such as manatees. These areas are sanctuary for native and migratory birds such as ducks, pelicans, pigeons, among others, and breeding grounds for various species of freshwater turtles, snails, crabs and others.

Likewise, these resources need to be protected against sedimentation and contamination that can cause serious disturbances in the medium term if preventive and corrective measures are not taken to protect the hydrographic basins. Proper management must be planned for the use of forests in places which impact the slopes of water sources.

Management is carried out through the different governance structures in the RACCN. In addition to the mayors is the Regional Government, a structure that only exists on the Caribbean Coast. Of the eight municipalities that comprise it, six have Indigenous Territorial Governments (GTI), legitimized by the population and legally recognized in the country. Eighteen GTI manage the development of 270 communities in total.

This territorial organization is based on Law 28, Statute of Autonomy of the Autonomous Regions of the North Atlantic and its regulations. It is also supported by Law 445, Law of demarcation of the communities of the Coco, Indio and Maíz Rivers.

Structure and Functions of Indigenous Territorial Government and Indigenous Community Government

The territory is governed by the authorities elected by the Territorial Assembly, the highest authority, and convened according to the established procedures (internal statutes of each territory). Representatives of each community participate through voice and vote in the Territorial Assembly.

Similarly, the Community Council, which is made up of community authorities, make urgent decisions that are the responsibility of the community. It is chaired by the Community Council of Elders.

The community is constituted in the traditional autonomic space that is most characteristic of Indigenous peoples and Afro-descendants, hence community governance. This community governance is made up of the government structures on the main aspects of community life: justice, spiritual life and economic, social and cultural reproduction. The role of governance is assumed in indigenous communities by councils of elders, *ditalyang*, *sukias*, *buyeis*, healers, midwives, and communal judges (*wihta* [miskitu] / *wistah* [mayangna]). Decisions are made in the communal assembly.

At the community level, the trustee is also responsible for relations with the non-indigenous world regarding aspects related to the territory and its natural resources.

Communities in general, and Karata in particular, have ecological, justice, community organization and health standards established and respected in the communities. These norms are oral and can usually be modified according to the needs of their inhabitants.

Territorial governance instruments

The Indigenous Territorial Government of Karatá has accumulated experience in the administration of communal property, from the Harrison Altamirano treaty and the consequent titling commission of 1905. The community of Karata have a land title, as provided in Law 445, which guarantees their rights to communal ownership of domain and possession, usufruct and administration. They also have their own statute that guarantees the institutional function and territorial governance. The legal instruments together with the implementation of Karata's traditional norms have allowed this territory to develop institutional capacity to implement territorial management. It has its own office, financial administrative unit, technical staff and land transportation.

The State provides Karata with funds from the Ministry of Finance and Public Credit for institutional strengthening and public investment in the territory. The territory also obtains funds from the rental of land for housing, without business purposes.

Bolivia, in the heart of the Amazon rainforest

In South America, between the Andes mountain range and the Amazon, is Bolivia. It has 36 ethnic groups, unlike Nicaragua which has six. Until 2009, the population register was at 9.7 million, of which Indigenous peoples made up 40%.

According to the constitutional foundations of the State, Bolivia is constituted in a Social Unitary State of Plurinational Community Law and is free, independent, sovereign, democratic, intercultural, decentralized and with autonomies. It is based on plurality and political, economic, legal, cultural and linguistic pluralism (CPE. Art. 1).

The official languages of the State are Castilian Spanish and all the languages of the Peasant Indigenous Nations and Peoples, which are Aymara, Araona, Baure, Bésiro, Canichana, Cavineño, Cayubaba, Chácobo, Chimán, Ese Ejja, Guaraní, Guarasú'we, Guarayu, Itonama, Leco, Machajuyai-kallawaya, Machineri, Maropa, Mojeño-Trinitario, Mojeño-Ignaciano, Moré, Mosetén, Movima, Pacawara, Puquina, Quechua, Sirionó, Tacana, Tapiete, Toromona, Uru-chipaya, and Weenina-wayek, Yuki, Yuracaré and Zamuco. (CPE. Art. 5. I.)

Despite being a strong population group, 5 of the 10 Indigenous peoples live in poverty; in Nicaragua it is six out of 10 indigenous groups. In this context, the San Miquel del Bala indigenous community in Bolivia was selected for the case study as a model community that has found a form of income for the community in ecotourism.

The San Miguel del Bala Indigenous Community is located in the Tacana Nation Territory to the north of the department of La Paz. It is in the buffer zone of the Natural Area of Integrated Management in the Madidi National Park. San Miguel del Bala is part of the 20 communities that make up the Council of the Tacana Indigenous People (CIPTA), whose most notable contributions are the management of land titling and the consolidation of indigenous territorial management.

CIPTA today has 18 productive associations, some with more than 10 years of management, that execute natural resource management projects in 16 communities of TCO (native community land) Tacana I and 4 communities of TCO Tacana II, with a total of 624 partners. The number of initiatives implemented with management plans approved by the organizations and the competent authorities has increased. CIPTA has achieved titling of 389,303 hectares (of which 39,430 ha. overlap with Madidi). In 2001, it filed a second lawsuit for TCO Tacana II on the northern edge of Madidi, currently in the process of reorganization.

The Tacana indigenous territories are of great importance for the continuity of the people in community systems of life with their own systems of authority and governance. They apply socio-environmental resilience, preserving the ecosystems of forests and savannas of the Amazon plain that are not represented in the protected areas of the landscape as well as characteristic species of the Bolivian Amazon fauna, such as jaguar (*Panthera onca*), londra (*Pteronura brasiliensis*), tailed jochi (*Dinomys branickii*), toranzo (*Cebus albifrons*), titi (*Callicebus aureipalatii*), swamp deer (*Blastocerus dichotomus*) and black caiman (*Melanosuchus niger*), among others. They are territories that host the greatest biological diversity in Bolivia.

Indigenous territorial management and conservation of water sources

The Tacana indigenous territory is directly linked to 20 different basins, which are part of the Beni River basin. Fifteen of them are born in the mountains of Tigre, Cuñaca, Hurehuapo, Mamuque and El Bala, whose headwaters mark the limit of the Madidi National Park. Important rivers arise from these basins, such as the Emero, Tequeje, Enapurera and Tarene. A study on indigenous territorial management and the protection of water sources in the Tacana native community land identified 83 rivers and streams, 75% of which originate in the mountains.

The Tacana territory protects an extensive continuous and intact forest that collects the water that descends from the mountains and on which its supply downstream depends. The basins of the Emero, Tequeje and Undumo rivers are born directly in the plains, being the aquifers (where the underground water is housed) that supply them with water.

The indigenous territory protects the springs of a large number of bodies of water that each contribute, on average, 0.83m^3 of water per second to the Beni River. This river discharges, in turn, up to $2,050\text{m}^3$ of water per second, at the height of the Narrow del Bala, to the basin of the same name. It is the Beni River that deposits the greatest amount of water and sediment with nutrients in the Madera River, the largest basin in the Amazon.

Different natural pressures and human activities threaten the maintenance of these basins. A vulnerability analysis within the basins to climate change reveals an average vulnerability in 63% of the area of the whole of the basins, especially the Emero, Undumo and Enapurera, which are within the TCO Tacana and on the border with the Madidi National Park. Basins with high vulner-

ability (18%) and extreme vulnerability (19%), such as the Turiapo River, occupy smaller areas, are crossed by the San Buenaventura-Ixiamas highway and are close to the town of San Buenaventura. This is a situation that puts the community lands of origin at risk.

Nature-based solution experience

Since 1995 when natural parks were declared protected areas, many families who lived from hunting, fishing and the forest were left without sources of income. San Miguel however knew how to adapt and seek alternative means of economic development to improve their quality of life. It is here that the San Miguel del Bala Community Ecotourism Association was born. The association is a community eco-tourism community company, which operates inside and outside the Madidi National Park with two shelters that show the world the Tacana culture and the biodiversity that surrounds it.

This form of ecotourism is based on the conservation of the Tacana territory, with the care of water basins, preservation of the town's own identity (without losing its customs and traditions) and sustainable use of the present biodiversity for the benefit of the population, "human sustainability" and mitigation of climate change.

The association was created with the aim of taking advantage of the natural attractions of its territory to attract tourists and to improve the quality of life of its inhabitants through the creation of jobs related to ecological tourism. It is an alternative economic activity demonstrating the possibility of the sustainable use of forest resources through tourism in a community that is organized, trained and provides all the services required by the community enterprise.

FILAC and the Pawanka Foundation's recent publication "Strengthening traditional knowledge for Resilience, based on Ecological Tourism" (2020) highlights that in this community three components related to ancestral knowledge are developed: i) water; ii) medicine from the mountain and iii) the ancestral constructions of Tacanas houses.

Bolivia has a policy for community tourism whose vision is to make this country an international tourist destination within the framework of the concept of sustainable tourism.

STATUS OF NATURE-BASED SOLUTIONS

The discussion on nature-based solutions can start with some of the key human rights messages in the post-2020 global biodiversity framework:

- Human rights and a healthy planet are mutually dependent. To have a safe, clean and healthy environment, we have to respect, protect and fulfill human rights. To realize our human rights, we must heal, protect and live sustainably on our planet.
- In all human cultures, particularly Indigenous peoples and local communities, there are diverse worldviews, values, ethics, and spiritual beliefs that embody and guide our reciprocal relationships with the rest of the planet.
- Biological diversity must be understood in relation to the cultural diversity that sustains and maintains it.

Although nature-based solutions is not a concept of Indigenous peoples, for centuries they have had the knowledge of the importance of protecting and caring for the environment that surrounds them.

Also a recent concept in academia, nature-based solutions is referred to by the European Commission as follows: “Nature-based solutions to societal challenges are solutions inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. These solutions bring more and more diversity to nature and natural features and processes in cities, landscapes and seas, through locally adapted, resource-effective and systemic interventions. Nature-based solutions should benefit biodiversity and support the provision of a range of ecosystem services.” Clearly there is no deviation from the vision of the ‘70s.

However, for Indigenous peoples this approach does not suit their reality. From the Western perspective, NBS is based on non-intervention, but Indigenous peoples “have lived in these natural ecosystems and have made controlled and respectful changes to these environments for their cultural survival. For Indigenous Peoples, their territory and nature are seen as living spaces, where there are a series of social, cultural, production, and spiritual interrelationships, which together lead to constitute the basis for the survival of culture and especially from a vision of harmonious and respectful interaction.” (Mairena)

Based on this, nature-based solutions cannot be carried out only with external actors; Indigenous peoples with their holistic vision also have solutions to the problems of their environment.

For such purposes, there are various organizational structures within a rural community that have developed common interests of the forest not only for the defense of their territory but for their own existence. In this case, the forest (forest and biodiversity resources) primarily constitutes the source of existence and the economic base of Indigenous peoples for good living.

ELEMENTS THAT CHARACTERIZE NATURE-BASED SOLUTIONS FROM COMMUNITY APPROACH

Based on the community practices of Indigenous peoples, we can say that routine activities they carry out are solutions to global problems, such as food sovereignty.

Karatá

The women in the Karata communities grow food from their patios such as tubers, vegetables and fruit trees, which guarantees the food of their families in an organic way. They have the ability to keep their native seeds and they also raise animals (large and small livestock, birds). The communities also have access to construction materials, such as pine wood, for which they must manage the forests in a way that remains sustainable.

All these elements make up the collective right, which the community calls territoriality. It is a challenge for the institutional framework of rural communities to include all these elements within the development agenda for good living. In addition, these rights must be associated with the constitutional laws and the norms created internally for the proper use and management of natural resources to achieve and maintain a collective development based on “Good Living.”

The ancestral practices of the indigenous populations in the Nicaraguan Caribbean Coast, in terms of worldview and development, are seen from a holistic vision in which the fundamental task consists of seeking and creating the material and spiritual conditions to build and maintain “good living,” which is also defined as “harmonic life.” The practices are transmitted from generation to generation, consisting of the use of herbs, baths, potions and invocations to spirits performed by healers and naturists.

For the community, the term, nature-based solutions, covers all forms of existence that Mother Earth has and how we use these resources for our benefit. In economic terms, for example, it is recurrent to find certain existing practices among the inhabitants that satisfy needs such as housing, hunting, fishing, and health through the use of traditional medicine. It involves a complementary relationship - everything lives and everything is important. Mother Earth has cycles, sowing times, harvest times, rest times, times to stir the earth, times of natural fertilization. Therefore, we must make proper use of natural resources.

This relationship with nature is the axis of the systems: economic, political, socio-cultural, and environmental. The concept, however, is not tied to money, says Karatá community deputy Wih-ta, Stanford Thompson. For him it is a daily practice that “is not based on economic growth, but rather the harmony between nature and man.”

The community midwife also relates that births have been attended in the community ancestrally, using traditional medicine; there may also be the participation of healers, elders and shepherds who provide support and emotional stability. However, at present traditional medicine is combined with Western medicine when necessary such as in the event of complication of deliv-

ery, for which coordination is made with the community health center for a patient's transfer to the city of Bilwi. In the same way, knowledge of the use of traditional medicine has been passed on from generation to generation, with older people generally having this role within families.

All these indicate that community members know about nature-based solutions, from their worldview, according to their knowledge and daily practices. It is also exercised through spirituality. Coexistence, harmony, unity and the good use of resources are elements of good living.

Bolivia

From ancestral wisdom, Indigenous peoples argue that nature-based solutions are not a new climate action nor should they focus on green and carbon markets. They have practiced nature-based solutions as a concept in their territories for centuries, which has led to maintaining the world's remaining biodiversity. For this reason, it is affirmed that it is necessary to change the paradigm and demonstrate that Indigenous peoples and their rights must be the center of debates and actions on NBS.

These peoples have an important heritage. Their heritage is a great comparative advantage to indigenous economies, compared to other groups or societies with which they coexist in their States. To date, the Indigenous peoples of Bolivia (Plurinational State) have consolidated 23 million hectares as collective property under Community Lands of Origin, which represent 21% of the country's total area.

"These territories (as in the other countries of the region) are very rich in natural resources, both on the surface and in the subsoil. They are areas of refuge that are still sometimes not economically exploited. Indigenous peoples claim to exercise autonomous control over them and rely for this on the normative recognitions that have occurred in the international law of our time in matters of territorial rights. They have a special attachment to the territories as sources of life and identity bond, as the origin of their specificity as differentiated and ancestral peoples. –In the same way– its cultural capital that is linked to the traditional knowledge and knowledge of land management in a sustainable way, pharmacopoeia, ethno-tourism, ethnoengineering, the tangible and intangible heritage of its peoples and communities."¹

The community economy of the Indigenous peoples is another civilizational model. It is a philosophy that now emerges with ancestral roots, strengthened by the diverse socioeconomic practices of families, organizations, peoples and that affirms that "Another Economy is Possible." However, Indigenous peoples live the great paradox. The forest areas of rich biological diversity are guardians of more than 80% of the continent. State-protected areas however suffer deforestation four times faster than community forests, as illustrated by the loss of 11.2% of "intact" forests in non-indigenous areas between 2000 and 2016. In this same period, the loss in "intact forests" in the indigenous areas was only 4.9%.

In this context, the South American country has proposed alternatives at the World Conference of Peoples on Climate Change and the Rights of Mother Earth in Tiquipaya, Bolivia (April 20-22, 2010) vis-à-vis carbon markets. These include the Joint Adaptation and Mitigation Mechanism

for the Comprehensive and Sustainable Management of Forests, concomitant with the proposal of developing countries, which continue to emphasize the importance of developing non-market mechanisms based on cooperation and historical climate justice. This issue should be addressed at the Conference of the Parties on Climate Change (COP26, 2021). However, it is also necessary to show the results of the projects implemented under this approach aimed at strengthening local economies and especially the initiatives of the Indigenous peoples, communities and organizations living in socio-environmental resilience with the biosphere. Alternatives based on ancestral knowledge for adequate and urgent adaptation to the effects of climate change at different scales must continue to be proposed.

In the face of the current crisis, the Nature-Based Solutions approach has potential to help address many of the impacts of the pandemic and climate change. If this approach is implemented in an equitable and holistic way, it should include supporting the capacities of the peoples and communities in the work areas to face the immediate impacts of the pandemic and above all help to create a more sustainable and resilient world after COVID 19.

Taking into consideration the previous definitions, mechanisms and tools and considering that the challenge of NBS “is to simultaneously provide human well-being and benefits from biodiversity,” a paradigm shift which puts Indigenous peoples and their rights at the center of NBS discussions is necessary. But challenges confront Indigenous peoples: overcoming the threats to their survival - the COVID 19 pandemic, the loss of their wisdom and traditional knowledge, cultures and languages; the effects of climate change on their life systems, the extractive pressure on natural resources by national and transnational companies and other development projects that negatively impact ecosystems and thus the life of indigenous nations and peoples; and the little influence they have on public decisions about their rights in the context of the pandemic.

In this panorama we can identify a set of elements in nature-based solutions in its environmental, social, economic dimensions to deepen the peoples’ socio-environmental resilience by taking advantage of its potential. These elements may be:

1. Having a common language and understanding of the utility, adequacy, functionality, applicability and relevance of NBS
2. Effective involvement of the higher bodies of the 193 member states of the United Nations System, the social movements mainly of the Nations and Indigenous peoples through their subregional, regional, continental and global articulations, as well as the People’s Diplomacy, pro-green development movements and pro-rights of Mother Earth, artists, filmmakers, musicians, NGOs committed to NBS, bilateral and multilateral organizations
3. Protecting nature from overexploitation
4. Increasing demand and supply of biosphere protective interventions
5. Incentivizing positive sustainable change.

The required tasks towards achieving these are awareness, knowledge (science, technology and green innovation), regulation, governance and responsible financing.

NATIONAL POLICIES AND NATURE-BASED SOLUTIONS

Nicaragua and Bolivia are countries that, in addition to recognizing the Indigenous peoples in their constitutions, have also created laws over the years that protect the territories where they live.

The Political Constitution of Nicaragua in Article 5 establishes that: “the State recognizes the existence of indigenous peoples, who enjoy the rights, duties and guarantees set forth in the Constitution, and especially those to maintain and develop their identity and culture, have their own forms of social organization and administer their local affairs, as well as maintain the communal forms of their lands and the use and enjoyment of them, all in accordance with the law. For the communities of the Atlantic Coast, the autonomy regime is established in this Constitution.”

Article 59 further states that Nicaraguans have the right to live in a healthy environment, as well as the obligation of its preservation and conservation. Its third paragraph declares: “We must protect and restore the integrity of ecosystems, with special concern for biological diversity and for all natural processes that support life.” It is for this reason that Nicaragua has signed and is part of the legislation, the Universal Declaration of the Common Good of the Earth.

Towards this, Law No. 127 or The General Law of the Environment and Natural Resources in Nicaragua was created and approved on March 27, 1996.² This law is intended to establish the norms for the conservation, protection, improvement and restoration of the environment and the natural resources that comprise it, ensuring their rational and sustainable use in accordance with the provisions of the Political Constitution. Article 105 prohibits mining and hydrocarbon exploration and exploitation concessionaires from dumping toxic or non-toxic waste into soils, rivers, lakes, lagoons and any other source of water, without proper treatment, which harms human health and the environment. Article 106 clarifies that renewable and non-renewable natural resources found in legally protected areas will not be subject to exploration and exploitation.

The Ministry of the Environment and Natural Resources (MARENA) is the regulatory entity of the country’s environmental policy.

Similarly, Law 445 “Regime of communal property of the indigenous peoples and ethnic communities of the autonomous region of the Atlantic coast of Nicaragua and of the Bocay, Coco, Indio and Maíz Rivers” makes it clear in Article 89 that the State recognizes the communal forms of ownership of the lands of the Indigenous peoples and ethnic communities of the Atlantic Coast. And Article 31 states that the Government of the Republic, the Autonomous Regions and the municipalities must respect the real rights over the communal lands that they have traditionally occupied, as well as over the natural resources they have traditionally used (La Gaceta, 2003).

In the Autonomous Region of the North Caribbean Coast through the safeguard policy embodied in the development plan of the Caribbean coast, an environmental management framework (AMS) is proposed, emphasizing the preparation of environmental assessments for any exploitation activity, be it forestry, fishing, livestock and others that could impact on the environment and the possible mitigation proposals in the face of effects of climate change. For the application of these norms, the responsible organizations are INAFOR, SERENA and MARENA, which, depending on the case, coordinate efforts with civil and security authorities.

On the other hand, the communities of the indigenous territory of Karata, through the authorities of their Independent Territorial Government, have established control standards, adhering to regional regulations such as the ban on fishing for snook and shrimp, which come into effect from February 15 to May 15. This applies only to fishing in the Karatá lagoon but coordinated with the Wawa Bar community and other neighboring communities such as Lamlaya and Dakban. For the mangrove use and management in the lagoon, they have established norms of not cutting any mangroves within a hundred meters from the shore of the lagoon inward and sanctions and fines for any violations. All these efforts are coordinated by the Independent Territorial Government of Karata with bodies such as MARENA and SERENA.

Bolivia has developed policies to implement NBS with the peoples' participation. Some of these are:

- The Political Constitution of the State of 2009 expressly recognizes the right of Indigenous peoples who are native farmers and the need to respect, value and promote their traditional knowledge and knowledge. In April 2010, Bolivia convened the World People's Conference on Climate Change and the Rights of Mother Earth with the aim of providing an alternative response and proposal to international policies.
- Food sovereignty law (No. 3545)
- Framework Law of Mother Earth and Integral Development for Living Well (No. 300)
- Law of Community Agricultural Productive Revolution (No. 144)
- Law to Support Food Production and Forest Restitution (No. 337) that allows and in a certain way promotes the conversion of soils to extensive systems.

In Bolivia's vision on climate and natural resource management, Living Well and Harmony with Mother Earth constitute two central factors in a new proposal to build a different vision of development that is not based on the market, growth, accumulation of wealth and the consequent destruction of nature as it is conceived as a thing or stock of raw materials (Pacheco, 2013). Bolivia promotes a non-mercantilist solution to the problems caused by climate change based on protecting the integrity of Mother Earth as an alternative to the commercialism of effective technological resources for developing countries, making payment of the climate debt effective. This proposal constitutes one of the main axes of its foreign policy.

These policies are accompanied by sources of financing for Indigenous peoples including:

- The Indigenous Development Fund (FDI) created by Supreme Decree No. 2493 (August 26, 2015) is a mechanism for managing, financing, directly executing and supervising programs and projects for the productive development of the Peasant Indigenous Peoples and Intercultural and Afro-Bolivian Communities.
- Banco de Desarrollo Productivo (BDP) is a mechanism to support micro and small companies in the productive or agricultural sector and recent start-ups with financial needs for seed capital for their initial stage. This is also geared to micro and small agricultural producers that require financing to diversify their products.

However, it should be borne in mind that although public policies have managed to significantly reduce indigenous poverty in the last decade, they have not been able to reduce inequities in this area. The COVID 19 pandemic has even doubled, if not tripled, the burden that Indigenous peoples are already experiencing due to the impacts of climate change.

CONCLUSIONS

This study allows us to verify that community life systems and their sociocultural guidelines in socio-environmental resilience with nature from their spirituality and traditional knowledge are fundamental for nature-based solutions. Governance systems in territorial jurisdictions managed by community authorities are also fundamental and necessary for nature-based solutions.

For Indigenous peoples, their territories and nature are seen as spaces of life where a series of social, cultural, productive and spiritual interrelationships together constitute the basis of survival and cultural identity and, above all, make up a vision of harmonious and respectful interaction between people and nature.

Legislation in Nicaragua and Bolivia protects collective rights. The communities are free to use and take advantage of the means of life related to the environment, according to their ancestral practices. To broaden the discussion on nature-based solutions, it is appropriate to take the indigenous experience as a reference.

Indigenous cultures, their deep relationship with nature through the land and territory, their community life system and their spirituality present in all these dimensions are verified in facts. For example, in the case of Bolivia, protected areas and the indigenous territories of the Amazon basin reach 43.6% of its surface (WSC, 2016), hosting a high biodiversity of the country. This natural wealth contributes to maintaining the integrity of the landscape through the zoning of areas of different communal uses, the maintenance of wildlife corridors and the protection of hydrographic basin headwaters. These indigenous cultures and their interrelationships with nature are also essential for preserving cultural values and generating opportunities for the sustainable management of natural resources. The community of San Miguel del Bala is located in this context.

Recognizing the historical contribution of the Indigenous peoples to the preservation of the country's biological diversity and in the face of climate change impacts, Bolivia has obtained 250 million dollars from the "Green Fund" under the UN Fund for Food and Agriculture for water projects to respond to the drought and water shortage that has generated concern among national and local authorities. Part donation, part loan, the agreement was signed in 2017 by former President Evo Morales in Rome. Bolivia also integrates the Green Climate Fund into its State program policy as a mechanism for nature-based solutions for implementing adaptation measures to reduce vulnerability to the consequences of climate change as well as for implementing mitigation measures to help avoid the increase in polluting emissions.

The Community Lands of Origin of the Tacana communities, one of them being the community of San Miguel del Bala, are key forested areas for global, regional and local climate stability and resilience. They contain almost 30% of the carbon stored in the forests of Latin America and 14% of the carbon in tropical forests worldwide (Saatchi et al 2011; Walker et al 2014; Frechette et al 2018). They have more carbon than all the forests in the Republic of Indonesia or the Democratic Republic of the Congo, the two countries with the largest tropical forest after Brazil (Walker et al 2014). This contribution constitutes an invaluable contribution by Indigenous Nations and Peoples in mitigating the effects of climate change and achieving the Sustainable Development Goals 2030.

The World Peoples Conference on Climate Change and the Rights of Mother Earth of Tiquipaya, Bolivia (April 20-22, 2010) has proposed alternatives to carbon markets such as the Joint Adaptation and Mitigation Mechanism for Management of Comprehensive and Sustainable Forest. Coming from the “developing” countries, these measures should also be considered at the Conference of the Parties in November 2021. However, it is necessary to show the results of the projects implemented under this approach oriented to strengthen local economies and especially the initiatives of Indigenous peoples, communities and organizations that live in socio-environmental resilience with the biosphere. Proposing alternatives based on ancestral knowledge for adequate and urgent adaptation to the effects of climate change at different scales should also continue.

In Nicaragua, for the Miskitu and Creole people of the Karatá community, nature has more than a financial or economic value. Seeing nature as an asset leaves aside the cultural and spiritual values of the peoples. For the Indigenous people, nature and the territory integrate the roots of the culture where their life and identity develop and reproduce every day. The territory and its sacred spaces are elements that the Indigenous peoples claim, and the disappearance of these collective territories will have a direct impact on their and humanity’s survival or extinction, hence the importance of continuing to study the situations that concern them to prevent and mitigate the impacts of climate change.

In Karatá, the harvesting and management system does not respond to the natural reforestation needs that these areas require. The effort to carry out sustainable programs for the recovery of forests has not been the most adequate. There is a tendency towards the neglect of the resource due to the low integration of the beneficiaries in programs that guide, train and make them responsible for its rational exploitation.

The experience of the territory in Karatá is valuable in terms of governance and can be taken up as a positive experience regarding NBS from the indigenous perspective. It is especially important in the case of marine-coastal areas in which the Indigenous peoples exercise their collective rights because the generation of income from the territory contributes to improving the living conditions of the people in the communities. Likewise, the communal and/or territorial government is a key actor since, within indigenous governance, it safeguards rights, guarantees collective property and ensures the exercise of rights.

Although this community’s indigenous practices of taking advantage of nature based on their culture and spirituality do not generate massive damage to nature, climate change and the linkage of fishing with national and international markets threaten the sustainability of the resources as well as the present and future of the lives of Indigenous peoples. Karata and other indigenous communities will increasingly suffer the effects of climate change, such as the recent experience of hurricanes Eta and Iota that hit the Autonomous Region of the North Caribbean Coast.

RECOMMENDATIONS

For Nicaragua

- Develop coordination and planning mechanisms every six months with the institutions that work in their territories to maintain good work coordination, transparency of resources and trust; this includes non-governmental organizations.
- Recommend actions to the Indigenous Territorial Government and Indigenous Community Government that part of the economic resources the State contributes to the territory are used to sustain the practices of caring for nature. In this sense, and due to the human bond with nature, vulnerable people in the community such as the elderly, mothers, among others, must also be supported, because is also they who maintain these practices and transmit them from generation to generation.
- Support sustainable production and marketing projects to reduce pressures on the environment and promote economic development in the territory. In addition, environmental education campaigns and implementation of the Municipal Development Plan are necessary with the vision of conserving protected areas.
- Promote knowledge about nature-based solutions among Indigenous peoples and ethnic communities so they can organize, train and access funds or find new forms of income to maintain the biodiversity of their communities based on their culture.
- Coordinate with MEFCCA and INTA the cultivation of citrus plants and others, such as ginger, soursop, avocado, which are used for consumption but also serve as medicinal plants. The passage of hurricanes Eta and Iota destroyed the crops.

For Bolivia

- Given the great importance of the historical contributions of Indigenous peoples in preserving the biosphere at a global level, it is necessary to integrate these Peoples and their knowledge into nature-based solutions through appropriate strategies that strengthen policies, plans and programs oriented to realizing their collective rights, especially to their lands, forests and territories; their traditional knowledge, practices and innovations; and their general contributions to sustaining and maintaining the environment, including climate adaptation and mitigation.
- Strengthen their own health systems and native languages, based on their traditional knowledge and spirituality, especially in these times of the COVID 19 pandemic.
- Although important achievements have been made and Bolivia as a Plurinational State presents some favorable conditions (at least in the legal and institutional framework) to advance the application of measures aimed at making rights effective and from the perspective of Indigenous peoples, it is recommended at the national and international level to incorporate the following elements within NBS tools and mechanisms:

- » Have a common language and understanding of the utility, adequacy, functionality, applicability and relevance of nature-based solutions.
- » Effectively involve the high parties of the 193 member states of the United Nations System, the social movements mainly of the nations and Indigenous peoples through sub-regional, regional, continental and global articulations, as well as the People's Diplomacy, pro-green development and pro-rights movements of Mother Earth, artists, filmmakers, musicians, and non-governmental organizations.
- » Protect nature from overexploitation.
- » Protect the traditional and/or ancestral knowledge of Indigenous peoples.
- » Increase the demand and supply of protective interventions for the biosphere.
- » Define strategies, plans and programs aimed at fulfilling the rights of Indigenous peoples, especially collective rights.
- » Encourage positive sustainable change, the required tasks being awareness, knowledge (science, technology and green innovation), regulation, governance and responsible financing.
- » Strengthen indigenous governance mechanisms, mechanisms that are generally oriented to survival of Indigenous peoples as peoples with identities and cultures, spirituality, territorial management; strengthen their community life system, indigenous jurisdiction, authority system, parenting patterns, and in general, their rights as peoples who have contributed and continue to contribute to the material and immaterial wealth of nations and at the global level.
- » Contribute to strengthening indigenous community-based organizations, such as the Indigenous Council of the Tacana People/CIPTA and the Central Indigenous People of Leco de Apolo/CIPLA, given the immense environmental, economic and sociocultural value of the territorial management they carry out in the Bolivian Amazon particularly in the Great Madidi Landscape.

In general, it is necessary to deepen future investigations, indigenous proposals in the institutional framework and public management of the State, especially in this new reality disrupted by the COVID-19 pandemic and climate change, and that Indigenous peoples have faced with traditional knowledge and practices that deserve to be known in depth. How and why is it, for instance, that in one of Latin America's poorest areas such as the Autonomous Region of the North Caribbean Coast - and despite the pain that COVID-19 has left - their environment and ways of life have prevented further damage, and they have been able to face a pandemic without counting on the resources of developed countries.

Endnotes

- 1 UC 3 (2018) Regional Study: Challenges and proposals for the economic development of Indigenous Peoples.
- 2 It was published in La Gaceta No. 105 of June 6, 1996.

Bolivia: San Miguel del Bala in Madidi National Park

By Center for Indigenous Peoples' Autonomy and Development

INTRODUCTION

Nature-based Solutions (NBS), as it is defined, refers to “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively simultaneously providing human well-being and biodiversity benefits” (IUCN Resolution WCC-2016-Res-069).¹ Achieving them may be considered the greatest challenge of our time.

From their ancestral wisdom, Indigenous peoples affirm that nature-based solutions is not a new climate solution, nor should they focus on carbon and green market actions. Nature-based solutions as a concept has been practiced by Indigenous peoples in their territories for centuries, and as such this has led to maintaining the world's remaining biodiversity. It is necessary to shift the paradigm and demonstrate that Indigenous peoples and their rights must be at the center of debates regarding NBS.

In this context, this study aims to demonstrate how Indigenous peoples contribute through their lifestyles, livelihoods and traditional knowledge to nature-based solutions in their lands, territories, and resources from their perspective and life practices. In some countries, these elements have been integrated into national policies and programs; in some cases, it is not recognized that these elements come from the visions of Indigenous peoples.

Indigenous peoples' experiences take into consideration that indigenous life systems are an integrated whole that take shape and content through concrete social achievements exercised historically and conditioned by the contexts in which relationships take place. Holistic and multi-dimensional worldviews characterize their cultural systems beyond their particularities and specificities as culturally and linguistically differentiated peoples and communities.

Given these considerations, it is difficult to identify, characterize, and analyze — in an integrated way through case studies — which issues can encapsulate these different dimensions which intersect in a complementary manner, in the perspective of the necessary paradigm shift whence it will be demonstrated that Indigenous peoples and their rights must be central to debates regarding nature-based solutions.

To achieve its objectives, this study used a systematic, interdisciplinary, and comprehensive methodology with a framework based on the generic, specific, and collective rights of Indigenous peoples, especially regarding their lands, forests, and territories, their knowledge, traditional practices and innovations, and their general contributions to sustain and maintain the environment, including adaptation to and mitigation of climate change.² It took into consideration the set of elements, which constitute an interrelated and comprehensive body of elements, through the following steps: i) coordination meetings, ii) collection of information, iii) analysis and processing of collected information, and lastly, iv) writing of the final analysis based on the predefined outline.

SOCIODEMOGRAPHIC CONTEXT OF STUDY AREA

The study was undertaken in Bolivia in west-central South America. When talking about the sociodemographic context of Indigenous Peoples and Nations, it is necessary to admit a necessary degree of caution: “for the majority of these countries— in the region— the numbers refer to the 2010 round of censuses, in some cases they are further from that year, be it further in the past— for example, Nicaragua in 2005— or further forward, with some countries’ numbers dating to 2018.” As such, sociodemographic information must be taken with much caution. Notwithstanding this, it can be affirmed that (The Plurinational State of) Bolivia, with an estimated 4,713,534³ inhabitants, is one of the countries with the greatest relative proportion of indigenous population at above 40% of its total population.

In accordance with the constitutional fundamentals of the State, Bolivia constitutes itself as a free, independent, sovereign, democratic, intercultural, decentralized, Unitary Social State of Plurinational and Community Rights with autonomies. It is founded on plurality and political, economic, legal, cultural, and linguistic pluralism (PCPSB, Art. 1). The established official languages of the State are Spanish (Castilian) as well as all the languages spoken by the Indigenous Peoples and Nations, which are: Aymara, Araona, Baure, Besiro, Canichana, Cavineño, Cayubaba, Chácobo, Chiman, Ese Eija, Guaraní. Guarasú’we, Guarayu, Itonama, Leco, Machajuyai-Kallawaya, Machineri, Maropa, Mojeño-Trinitario, Mojeño-Ignaciano, Moré, Masetén, Movima, Pacawara, Puquina, Quechua, Sirionó, Tacana, Tapiete, Toromona, Uru-Chipaya, Weenhayek, Yaminawa, Yuki, Yuracaré, and Zamuco (PCPSB, Article 5.I.).⁴

By referencing Indigenous peoples’ right to well-being, in the context of inequalities in Latin America—Abya Yala where poverty levels by income persist among Indigenous peoples, 6 out of every 10 indigenous people suffer this situation in Nicaragua and 1 of 2 in Bolivia. These two countries (Nicaragua and Bolivia) have the smallest inter-ethnic gaps, though the above statistics are still significant. Notwithstanding this, it must be kept in mind that if public policies have managed to ostensibly reduce poverty among Indigenous peoples in the last decade, they have not been able to reduce material inequalities.⁵ This situation has been aggravated by the COVID-19 pandemic, which has doubled, if not tripled, the pressures which they are experiencing due to the impacts of climate change.

In this context the present study has a systemic, comprehensive, and interdisciplinary focus, given that approaching NBS when related to Indigenous peoples should not be done without considering critical key points for the exercise of their general, specific, and collective rights, especially to their lands, forests, and territories, as well as to their traditional knowledge, practices, and innovations to sustain and maintain the environment, including adaptations and mitigation of climate change. In this sense, Bolivia presents some favorable conditions (at least in terms of its legal and institutional framework) to advance the application of measures oriented towards the exercise of the referenced rights.

STATE OF NATURE-BASED SOLUTIONS

What are nature-based solutions to Indigenous peoples? From the viewpoint of their ancestral knowledge, Indigenous peoples assert that nature-based solutions are not a new form of climate action and should not be focused on green or carbon markets. Nature-based solutions as a concept has been practiced by Indigenous Peoples in their territories for centuries⁶ and as such this has led to the protection of the world's remaining biodiversity. For this reason, it is necessary to shift the paradigm and demonstrate that Indigenous peoples and their rights must be central to debates and actions regarding NBS.⁷

Indigenous peoples' communal life systems are based on a strict respect for their socio-cultural guidelines, applying their knowledge and technologies regarding nature in an institutionally reciprocal "economic" process for human life in balance with Mother Earth, producing the goods needed for self-sustainable "growth" and "development" from their community life systems. These systems are based on their geographical environment, socio-environmental resilience, intergenerational relationship and collective identities through which determined exchange relationships are produced.

These peoples have an important heritage. Their heritage is a great comparative advantage to indigenous economies, compared to other groups or societies with which they coexist in their States. To date, the Indigenous peoples of the Plurinational State of Bolivia have consolidated 23 million hectares as collective property categorized as Native Community Land (NCL), which represents 21% of the country's total area.

These territories (much like in the other countries of the region) are very rich in natural resources, both on the surface and in underground. They are areas of refuge of which some parts are still not economically exploited. Indigenous Peoples claim to exercise autonomous control over them, and for their sovereignty over these lands they rely on regulative recognitions that have occurred in contemporary international law regarding matters of territorial rights. They have a special attachment to their territories as sources of life and identity, as the origin of their specificity as differentiated and ancestral peoples; likewise, their cultural capital is linked to their traditional knowledge and wisdom regarding land management in a sustainable way, medicinal production, ethno-tourism, ethnoengineering, and the management of tangible and intangible heritages of peoples and communities, etc.⁸

Indigenous peoples' community economies are a different civilizational model. It is a philosophy which now reemerges with its ancestral roots, strengthened by the diverse socio-economic practices of families, organizations, and Peoples. This model affirms that "Another Economy is Possible." However, Indigenous peoples live a great paradox. They are protectors of more than 80% of the continent's most biodiversity-rich forest areas.⁹ On the other hand, forest areas protected by their respective States suffer deforestation at a rate four times faster than that suffered by community forests,¹⁰ as seen by the loss of 11.2% of their "intact" forests in non-indigenous areas between 2000 and 2016. In indigenous areas during this same period, the loss of "intact"¹¹ forests was 4.9%.

The World People's Conference on Climate Change and the Rights of Mother Earth in Tiquipaya, Bolivia (April 20-22, 2010) proposed alternatives to carbon markets, such as the Joint Adaptation and Mitigation Mechanism for Comprehensive and Sustainable Forest Management, concomitant with the proposal of developing countries, which continue to emphasize the importance of developing non-market mechanisms based on cooperation and historical climate justice. This issue should be addressed at the November 2021 Conference of the Parties on Climate Change (COP26).¹² However, it is necessary to show the results of the projects implemented under this approach aimed at strengthening local economies, especially the initiatives of Indigenous peoples, communities and organizations living in socio-environmental resilience with the biosphere. They continue to propose alternatives based on ancestral knowledge for adequate and urgent adaptation to the effects of climate change at different scales.¹³

The Paris Accord with 193 signatory countries aims to strengthen the global response to the threat of climate change in the context of sustainable development and efforts to eradicate poverty (PA. 2015. Art. 2:1).¹⁴ From the indigenous perspective, what is required is to guarantee a biocentric culture for human survival in balance with Mother Earth, as well as to respect and integrate the rights-based approach in all commitments, including those of Article 6 that are based on markets and were integrated into the agreement's preamble.

In the face of the current crisis, NBS approaches have enormous potential to help address the many impacts of climate change and the COVID-19 pandemic. If these approaches are carried out in an equitable and holistic way, it must include supporting the capacities of the peoples and communities in the work areas to cope with the immediate impacts of the pandemic and, above all, help to create a more sustainable and resilient world after the pandemic.

Before the pandemic, some Indigenous peoples' organizations had been making efforts to participate in NBS-related debates and initiatives being carried out at the global level.¹⁵ Special care must be taken when carrying out discussions about an old approach under another name to not leave them out, both in discussions and implementation of actions related to NBS.

However, organizations such as the Tebtebba Foundation (Philippines) consider that Indigenous peoples still have no global understanding of NBS as defined by external actors. Similarly, synergistic action and strategies still need to be developed on how to engage with the agencies that promote nature-based solutions.

Globally, efforts are underway to make NBS operational. The UNFCCC Standing Committee on Finance (SCF) is set to look at financing Nature-based Solutions for its 2021 Forum. The SCF advises¹⁶ the Conference of the Parties to the UNFCCC¹⁷ and ultimately the Green Climate Fund (GCF)

where there is a growing momentum in favor of NBS as a key factor in its future portfolio. The Fund is currently preparing its various sector guides intended to guide Accredited Entities (AEs) in preparing their portfolio. One of the sectoral guidelines being developed is on land and forests, where nature-based solutions are considered as a potential topic for GCF proposals.¹⁸

The Green Climate Fund's policy regarding Indigenous peoples, in our opinion, captures the spirit and intent of what NBS are to Indigenous peoples. Its full and effective implementation will support and reinforce the recognition of their perspectives and priorities in NBS. In this regard, it is essential to observe how the Fund has been applying its own Indigenous Peoples Policy in terms of evaluation, approval and follow up of approved funding proposals.

However, a gap remains in the GCF's understanding in their portfolio to date in relation to Indigenous peoples, as there is no complete picture of how many projects are going to be implemented in their territories, what these projects are like and how they are likely to affect them. Therefore, this project aims to address these issues by working to ensure that recognition and support for Indigenous peoples' rights, priorities and perspectives are central to the discourse, design and funding of NBS within major fora in climate policy, particularly in the GCF and the FEC.¹⁹

Taking into consideration the preceding definitions, mechanisms and tools and considering nature-based solutions seek to "simultaneously provide human well-being and biodiversity benefits," we identify the following challenges:

- need for a paradigm shift that demonstrates that Indigenous peoples and their rights should be central to debates on NBS;
- overcome the threats to their survival in the face of the serious emergency caused by the COVID 19 pandemic, the loss of their wisdom and traditional knowledge, cultures and languages, and the effects of climate change on their life systems;
- "the pressure on natural resources - forests, minerals by national and transnational companies;
- raw material-export expansion and execution of major civil projects with negative impacts on ecosystems and consequently on the lives of indigenous nations and peoples;"²⁰
- limited influence that Indigenous peoples have in public decisions about their rights, which has been exacerbated in the context of the pandemic.²¹

With this overview we can identify a set of elements that make nature-based solutions in their environmental, social, and economic dimensions able to deepen the socio-environmental resilience of the "human race" by taking advantage of their full potential. These elements can be:

1. Having a common language or terminology and understanding of the utility, adequacy, functionality, applicability and relevance of Nature-based Solutions;
2. Effective involvement of the high parties of the 193 member states of the United Nations System, of Indigenous peoples' and Nations' social movements through their sub-regional, regional, continental and global articulations, as well as the People's Diplomacy, pro-green development movements and pro-rights of Mother Earth, artists, filmmakers, musicians, NGOs committed to NBS, bilateral and multilateral organizations to:
3. protect nature from overexploitation,

4. increase the demand and supply of protective interventions for the biosphere,
5. incentivize positive sustainable change, the required tasks being: raising awareness, knowledge (science, technology and green innovation), regulation, governance and responsible financing.²²

NATIONAL POLICIES AND NATURE-BASED SOLUTIONS²³

Political Will

Within the framework of the Rio 1992 Conference, Bolivia joined the United Nations Framework Convention on Climate Change and ratified it in 1994. Additionally, it signed the Convention on Biological Diversity. Since then, Bolivian policy to date with regards to the environment has oscillated a great deal. The Good Living paradigm and the search for balance with Mother Earth placed the country in a nonaligned position with the REDD+ mechanism, which is promoted by the United Nations. This position and the national agenda aim to achieve food sovereignty, empower indigenous and rural communities, and to protect forest ecosystems.

Regulatory Framework

The regulatory framework that supports the position of the country (in addition to the ratification of international treaties related to these matters) is widely reflected in the new “Political Constitution of the State” and in laws such as the Food Sovereignty Law (No. 3545), Framework Law of Mother Earth and Integral Development for Good Living (No. 300), Community Agricultural Productive Revolution Law (No. 144)” and Support for Food Production and Forest Restitution Law (No. 337) that allows and promotes the conversion of soils to extensive systems.²⁴

Institutional and Organic Framework

The 2009 Political Constitution of the State expressly recognizes the rights of Indigenous, Native, or rural Peoples and the need to respect, value, and promote their traditional wisdom and knowledge. In April 2010, Bolivia held the World Peoples’ Conference on Climate Change (WPC-CC) with the aim of responding and proposing alternatives to international policies.

In 2012, the Framework Law for Mother Earth and Comprehensive Development for Good Living No. 300 was approved, establishing a new institutional framework for climate change: the

Plurinational Authority for Mother Earth (APMT). The APMT “(...) acts within the framework of the plurinational climate change policy and plan for Good Living with a transversal and intersectoral approach and is responsible for the formulation of policies, planning, technical management, preparation and execution of strategies, plans, programs and projects (...) [it] coordinates, manages and executes the plans, programs, projects and activities which are registered and approved within the framework of national policies and the Plurinational Plan on Climate Change and in those in which there is concurrence of financing, in coordination with the Government with self-employed and public and private entities” (Law 300). The APMT is also the Designated National Authority to assess and channel Green Climate Funds.

A Developing Programmatic Framework

In Bolivia’s vision of climate and natural resource management, Good Living and harmony with Mother Earth constitute two central factors of a new proposal to build a different vision of development that is not based on market growth or accumulation of wealth and the consequent destruction of nature as it is conceived as a thing or stock of raw materials (Pacheco, 2013). Bolivia promotes a non-mercantilist solution to the problems caused by climate change, proposing alternatives based on protecting the integrity of Mother Earth as an alternative to the commercialism of effective technological resources for developing countries, making the payment of the climate debt²⁵ effective. This proposal constitutes one of the main axes of Bolivia’s foreign policy.

The Ministry of Rural Development and Land (MDRyT) asserts that sustainability, when achieved through the social actions of different cultures, necessarily implies reevaluating and updating their knowledge as well as their interests and rights to the reappropriation of nature that they inhabit. In this way, “sustainability must be defined within the framework of a dialogue between knowledge, where the wisdom of our peoples is the most forceful source for the decolonization of knowledge.”²⁶

This vision for the protection of Mother Earth’s integrity must necessarily improve practices for the use of natural resources, reducing the agricultural frontier’s advance - to focus on sustainable intensification of use for agricultural means, capacity development, developing research systems and knowledge exchange, implementing resilient agricultural practices, adapting production systems to highly changing conditions, and strengthening rural and indigenous organizations. The long-term planning of the country is reflected in the Patriotic Agenda 2025, with 13 pillars whose links in relation to climate change are:

- At national level, by 2025 the link between the agrarian and forestry agenda will have been consolidated, and full complementarity between food production and forest conservation will have been reached;
- Production systems will be efficient and shall produce high agricultural yields, incorporating the focus of life systems with a biocultural vision and developing Mother Earth’s capacity to sustainably regenerate;

- Bolivia will have developed territorial management processes for developing sustainable productive systems with optimal use of soils, combining forest conservation and environmental functions with the performance of productive activities and food production. (Villarreal, et al., 2018)

Financing Mechanisms for Indigenous Peoples

In accordance with the Political Constitution, the Plurinational State of Bolivia (Article 306) has established a model for plural economy with four forms of economic organization: i) public, ii) private, iii) **community**, iv) social cooperative; with a property regime: i) State, ii) private, iii) **community lands**, iv) private associative; and with the following forms of productive organization: i) State, ii) private, iii) **community reciprocal solidarity**, and, iv) associative solidarity.

Indigenous Development Fund

The Indigenous Development Fund (IDF), created by Supreme Decree No. 2493 (August 26, 2015), is a mechanism with the purpose of managing, financing, directly executing and supervising programs and projects for productive development in Indigenous, Native, and Peasant Peoples and Intercultural and Afro-Bolivian Communities.

According to regulations, the IDF implements its activities in two distinct ways:

“Financing and/or execution of productive programs and/or projects based on Local Potentials, in the municipalities and in rural native indigenous autonomies, at the request of the Native Rural Indigenous Communities, Peasant, Intercultural and Afro-Bolivian Communities where the projects are carried out and are developed within the framework of community life systems, many of them focused on the bio-community.”

“Financing and/or execution of programs and/or productive projects pertinent to Sectorial priorities and National Strategy, which may be concurrent to the capacities of municipalities and the rural native indigenous autonomies, with the participation of the Rural Native Indigenous Communities, Rural Communities, and Intercultural and Afro-Bolivian communities, in coordination with the autonomous municipal governments and the governments of the rural native indigenous autonomies, and they must grant resources from counterparts for the execution of programs and projects within the framework of intergovernmental agreements.” (S.D. N ° 2493, Art. 4, a. B.)

Productive Development Bank

The Productive Development Bank is a mechanism to provide financial aid to micro and small businesses in the productive or agricultural sector, which have recently opened and have financial needs that they need to meet to grow (seed capital). Likewise, it provides aid to micro and small producers in the agricultural sector who require financing to diversify into new activities.

COMMUNITY ECOTOURISM: EXPERIENCE OF SAN MIGUEL DEL BALA COMMUNITY IN MADIDI NATIONAL PARK

The San Miguel del Bala Indigenous Community, with an average annual temperature of 24.8 °C, is located in the Tacana Nation Territory to the north of the department of La Paz.²⁷ It is in the buffer zone of the Integrated Management Natural Area in the Madidi National Park.²⁸ San Miguel del Bala, founded on September 29, 1846, is part of the 20 communities that make up the Council of the Tacana Indigenous People (CIPTA) whose most notable contributions are the management of land titling and the consolidation of indigenous territorial management.

Today CIPTA has 18 productive associations, some of which have more than 10 years of management experience. The associations execute natural resource management projects in 16 communities of TCO (native community land) Tacana I and 4 communities of TCO Tacana II, with a total of 624 partners. The number of initiatives that are executed with management plans approved by the organizations and competent authorities has increased.²⁹ CIPTA has achieved the restoration and titling of 389,303 hectares (of which 39,430 hectares overlap with Madidi). In 2001, it filed a second lawsuit for TCO Tacana II on the northern edge of Madidi, currently in the process of reorganization.

NBS Experience

The Tacana indigenous territories are of great importance for the continuity of the Tacana people through their community systems of life and their own systems of authority and governance. They are a People engaged in socio-environmental resilience, preserving the forest and savanna ecosystems of the Amazon plain that are not represented in the protected areas of the landscape as well as the characteristic species of the Bolivian Amazon fauna, such as the jaguar (*Panthera onca*), Londra (*Pteronura brasiliensis*), tailed jochi (*Dinomys branickii*), toranzo (*Cebus albifrons*), titi (*Callicebus aureipalatii*), swamp deer (*Blastocerus dichotomus*) and black caiman (*Melanosuchus niger*).³⁰ They are territories that are home to the greatest biological diversity in Bolivia.³¹

Since 1995 when the natural parks were made protected areas, many families that made a living from hunting, fishing, and forestry have been without incomes. San Miguel was able to adapt and find alternative pathways to economic development to improve its quality of life. This is where the San Miguel del Bala Community Ecotourism Association was born. A community ecotourism venture which works within and outside the Madidi National Park, the Association has two shelters which exhibit Tacana culture and the surrounding biodiversity.³²

This form of ecotourism is based on the conservation of the Tacana territory, focusing on caring for water basins, the preservation of the town's own identity (without losing its customs and traditions), and the sustainable use of existing biodiversity for the benefit of the population, "human sustainability" and mitigation of climate change.

The Association was created to take advantage of the territory's natural attractions to attract tourists and to improve the quality of life through the creation of jobs in ecological tourism as

an alternative economic activity. Their developed model demonstrates that the sustainable use of forest resources is possible through tourism developed in a community, which is organized, trained and provides all the services required by the community enterprise.³³

A recent publication on “Strengthening traditional knowledge for Resilience, based on Ecological Tourism” (2020) by FILAC (Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean) and Pawanka Fund highlights the development of three components related to ancestral knowledge in this community: i) water; ii) natural medicine and iii) the ancestral constructions of Tacana houses.

Health system based on traditional knowledge

To Indigenous peoples, health is “The relationship of deep harmony and balance of people (with themselves, with families, with communities, with all other beings, with Mother Earth and the cosmos.” Traditional medicine is part of the cultural legacy of the Tacana people who have developed a great knowledge regarding a wide variety of medicinal plants (leaves, roots, barks, flowers, seeds, resins, oils) and have developed combinations of these to prepare infusions, syrups, plasters and powders for the healing of different physical ailments.

Elders, women and men constitute the living memory and wisdom about the traditions and forms of peaceful coexistence with nature and the knowledge about the benefits and properties of natural medicine, which has been used since the first generations that inhabited indigenous territories. They are the wise men and women resorted to for healing and curing diseases, ailments and any other problem that affect people in the community.³⁴

For these peoples, health and healing are closely linked to their spiritual world and to their connection with nature. Despite many of these traditions losing strength over time, ancestral knowledge linked to traditional medicine has been integrated into the communities’ cultural activities and thus maintained.

During the process of identifying medicinal plants, elders and youth who participated identified around 40 medicinal plants, their applications, forms of collection and use. Not only are the medicinal properties of plants (and some animals) known, but also the common diseases related to childbirth and children, following some family protocols.

Traditional medicine continues to be an alternative to Western medicine and facilitates greater access to healthcare, especially in places where hospitals, clinics and health centers are scarce. Its use is widespread in communities and is an important health alternative for the people. It also contributes to strengthening cultural identity and territorial management based on the use and conservation of natural resources. This practice contributes to the achievement of the 2030 Sustainable Development Goals, inasmuch as they are actions in response to climate change and sustainable development.

Public policy on community tourism

“Community tourism policy is a vision of the country to make Bolivia an international tourist destination” within the framework of the concept of sustainable tourism.³⁵ As a mechanism, this policy has leverage through the State’s Bolivian Tourism Agency (BOLTUR) through the “Bolivia is Waiting for You” program and through private and community initiatives on touristic ventures in the country.³⁶ It also extends to management of tourism at the regional level.

“The promotion of alternative forms of tourism consistent with the principles of sustainable development... as well as the promotion of the diversification of touristic offerings, constitute a guarantee of stability in both the medium and long term. To pursue this end, it is necessary to ensure and actively reinforce regional cooperation, particularly in the case of small islands and areas of greater ecological fragility.”

This perspective is considered to be part of the Government’s Program (2020-2025) through its strategy oriented towards promoting the use of community practices and ventures.³⁷

Traditional health and medicine

The Government’s Program (2020-2025) likewise promotes the strengthening and universalization of the Intercultural Community Family Health National Policy (SAFCI) which “prioritizes the promotion of health and prevention of illnesses at three levels of attention and to recover traditional ancestral medicine.” Institutionalized through the Bolivian Ancestral Traditional Medicine Law No. 459, this guarantees rights and duties of traditional doctors, spiritual guides, midwives, naturists and the populations they care for (General Directorate of Traditional and Intercultural Medicine of the Ministry of Health, 2021).

Joint efforts with university research institutes

The Ministry of Health and Sports and various universities in the country are currently undertaking joint efforts, through the General Directorate of Traditional Medicine and Interculturality, to strengthen the mechanisms of traditional medicine services, given the measures and procedures carried out by Indigenous peoples independently in the face of the emergency caused by the COVID-19 pandemic.

Indigenous territorial management and water source conservation

The Tacana indigenous territory is directly linked to 20 different water basins, which are part of the Beni river basin. Fifteen of them are born in the Tigre, Cuñaca, Hurehuapo, Mamuque and El Bala mountains whose headwaters mark the border of Madidi National Park. Important rivers arise from these basins, such as the Emero, Tequeje, Enapurera and Tarene. The study on indigenous territorial management and the protection of water sources in the Tacana TCO identified 83 rivers and streams, 75% of which originate in the aforementioned mountains. The Tacana territory protects an extensive continuous and intact forest that collects the water that descends from the mountain ranges and on which downstream water supplies depend. The basins sourced

from the Emero, Tequeje and Undumo rivers are born directly in the plains where aquifers supply them with water.

The indigenous territory protects the springs of a large number of bodies of water that each contribute, on average, 0.83m³ of water per second to the Beni River. This river discharges in turn up to 2,050 m³ of water per second at the height of the del Bala narrow to its eponymous basin. The Beni River deposits the greatest amount of water and sediment with nutrients in the Madera River, the largest basin in the Amazon.

Different natural pressures and human activities threaten the preservation of these basins. The vulnerability analysis within the basins to climate change shows the level of exposure, sensitivity and adaptation capacity of the different ecosystems. The results reveal an average vulnerability in 63% of the basins' areas, especially the Emero, Undumo and Enapurera, which are within the Tacana COL and on the border with the Madidi National Park. Basins with high vulnerability (18%) and extreme vulnerability (19%), such as the Turiapo River, occupy smaller areas, are crossed by the San Buenaventura-Ixiamas highway, and are close to the town of San Buenaventura, which puts the community and original lands at risk.

INDIGENOUS PEOPLES IN LOCAL AND NATIONAL ADVOCACY PROCESSES

We have to admit that social movements, especially those of the Indigenous Rural Nations and Peoples and Intercultural and Afro-Bolivian Communities, have become the driving force behind the Plurinational State of Bolivia's construction project with their approaches and proposals for transformative and constitutive change, participation in different levels of public power and their responsibility to exercise social participation and control. In accordance with the Political Constitution (TITLE VI: Participation and Social Control [Art. 241]):

"I. The sovereign people, through organized civil society, will participate in the design of public policies. II. Organized civil society will exercise social control over public management at all levels of the State, and over companies and public, mixed, and private institutions that administer fiscal resources. III. Civil Society will exercise social control over the quality of public services. IV. The Law will establish the general framework for the exercise of social control. V. Civil society will organize itself to define the structure and composition of social participation and control. SAW. State entities will generate spaces for participation and social control by society."

It is from this framework that these social structures participate in local, municipal, departmental, regional, national and international governments as organized peoples with their own linkages through the Captaincies, Ayllus, Sub-centrals, Centrals, Federations and others. Additionally, there are delegations in official international, bilateral or multilateral missions through coordination with the Ministry of the Presidency through the Vice Ministry of Coordination with Social Movements. This has the objective to:

“Enable and facilitate coordination between the Executive body and society through effective and efficient management of social needs, strengthening social organizations, and systematically monitoring the agreements and conventions established between the national government and civil society organizations, as well as the analysis of socio-political conflicts, promoting intercultural public management, based on dialogue and mutual agreement.”³⁸

Another avenue of engagement for civil society is the Indigenous Peoples Unit of the Ministry of Foreign Affairs. For this process, through 2002-2004 the Unity Pact was created by the following national organizations: Confederación Sindical Unica de Trabajadores Campesinos de Bolivia (CSUTCB), National Council of Ayllus and Markas del Qullasuyu (QONAMAQ), Confederation of Indigenous Peoples of Bolivia (CIDOB), Trade Union Confederation of Intercultural Communities (CSCIB), “Bartolinas Sisa” National Confederation of Native Indigenous Rural Women (CNMCIO-“BS”).

In the past decade, through the civil society coordination mechanism, the Coordinadora de Organizaciones Indígenas y Campesinas de Bolivia (COICABOL/Indigenous and Rural Organizations’ Coordinator), civil society formulated the Strategic Plan (2008-2018) aimed at influencing the area of public and private territorial orders through five strategies, namely:

“i) Advocating for public policies, ii) Strengthening Indigenous and Rural Peoples’ and Intercultural and Afro-Bolivian Communities and their organizations, iii) Management of an identity-based development proposal, iv) Development of a training program, and v) implementation of a communication and dissemination strategy.”

CONCLUSION

This study allows us to verify that community life systems and their socio-cultural traditions for socio-environmental resilience with nature from their spirituality and traditional knowledge are fundamental for nature-based solutions. Also fundamental and necessary for NBS are governance systems in territorial jurisdictions managed by their own authorities.

Indigenous cultures and their deep relationships with nature through their lands and territories, community life system and spirituality, which are present in all these dimensions, are manifest, as in the case of Bolivia. The protected areas and indigenous territories of the Amazon basin cover 43.6% of its surface (WSC, 2016) and thus host much of the country's biodiversity. This natural wealth contributes to maintaining the integrity of the landscape through the zoning of areas for different communal uses, the maintenance of wildlife corridors and the protection of hydrographic basin headwaters. Along with this, the preservation of cultural values and generation of opportunities for the sustainable management of natural resources is also essential.³⁹ San Miguel del Bala finds itself located in this geographical context.

Recognizing the Indigenous peoples' historical contributions in preserving the country's biodiversity and in the face of the effects of climate change, Bolivia has obtained a financial commitment of \$250 million from the United Nations Fund for Food and Agriculture "Green Fund" for water projects to respond to the drought and water shortage that has been a great national and local concern. The part donation-part loan agreement was signed in 2017 by former President Evo Morales in Rome.⁴⁰

Bolivia integrates the Green Climate Fund into its State program policy as a mechanism for nature-based solutions to implement adaptation measures aimed at reducing vulnerability to the consequences of climate change as well as of mitigation measures to help prevent an increase in pollutant emissions.

The Tacana communities' Community Original Lands, one of them being around San Miguel del Bala, are key forested areas for global, regional and local climate stability and resilience. They contain almost 30% of the carbon stored in the forests of Latin America and 14% of the carbon in tropical forests worldwide (Saatchi et al 2011; Walker et al 2014; Frechette et al 2018). They sink more carbon than all the forests in the Republic of Indonesia or the Democratic Republic of the Congo combined, the two countries with the largest tropical forests after Brazil (Walker et al 2014). This contribution constitutes an invaluable contribution by Indigenous Nations and Peoples in mitigating the effects of climate change and achieving the 2030 Sustainable Development Goals.

RECOMMENDATIONS

Given the great importance of Indigenous peoples' historical contributions to preserving the biosphere at the global level, it is necessary to incorporate these Peoples and their knowledge and wisdoms in Nature-based Solutions through more adequate strategies to strengthen policies, plans, and programs meant to enable the exercise of their collective rights, their traditional practices and innovations, and their general contributions to the sustenance and maintenance of the environment, including adaptations and mitigations as a response to climate change.

It likewise is necessary to reinforce their health systems and back up the use of native languages based on their traditional knowledge and spirituality, above all in times such as the COVID-19 pandemic.

It is necessary to further investigate through an in-depth study the realization of indigenous assertions and proposals in public management and institutionality of the State now more than ever in current conditions as defined by the COVID-19 pandemic and the climate change crisis.

In this sense, if there are important achievements and the Plurinational State of Bolivia presents favorable conditions (at least with regard to formal legal and institutional frameworks), measures should be used to strengthen the exercise of the aforementioned rights.

To go forward more effectively and take advantage of the potential of nature-based solutions, it is recommended at both the national and international level to incorporate the following elements into tools and mechanisms for nature-based solutions:

1. Have a common language/terminology and understanding regarding the utility, adequacy, functionality, applicability, and pertinence of nature-based solutions.
2. Effectively involve the upper parties of the 193 member states of the United Nations System, social movements - namely those of Indigenous Peoples and Nations - through their sub-regional, regional, continental, and global modes of participation; Peoples' Diplomacy; Pro-Green Development and pro Mother Earth's rights movements, as well as artists, filmmakers, musicians, and NGOs, bilateral and multilateral organisms committed to nature-based solutions.
3. Protect nature from overexploitation.
4. Protect Indigenous peoples' traditional and/or ancestral knowledge.
5. Increase the demand and supply of protective interventions for the biosphere.
6. Define strategies, plans, and programs for the achievement and exercise of Indigenous peoples' rights, especially their collective rights.
7. Incentivize positive sustainable change. The required tasks to do so are awareness-raising (in green science, technology, and innovation), regulation, governance and responsible financing.⁴¹
8. Strengthen indigenous mechanisms for governance, which are oriented towards the Indigenous peoples' survival as peoples with distinct identities, cultures, spiritualities, territorial management systems. Strengthen their community-based life systems, indigenous

jurisdiction, systems of authority, child-rearing patterns and in general their rights as peoples who have contributed and continue to contribute to the material and immaterial wealth of nations and of the world.

9. Cooperate towards strengthening Indigenous community-based organizations (e.g. the Tacana Peoples Indigenous Council - CIPTA, Apollo Leco Indigenous People's Center -CIP-LA), given the enormous environmental, economic, and socio-cultural value that their territorial management contributes to the Bolivian Amazon, particularly in the Great Madidi Landscape.

[Felipe Teran Gezn was the researcher for this study.]

Endnotes

- 1 AFD-UICN-CEM (2019). Global Standard for Nature Based Solutions. Available at: https://www.iucn.org/sites/dev/files/content/documents/2019/global_standard_for_nature-based_solutions_spanish_2.pdf.
- 2 For this reason, the comprehensive, systematic and holistic research methodology is used, taking into account the guidelines that have been given to the consultant, as well as in the preparation of forms, surveys and study tools, and conducting interviews with regional and national indigenous leaders.
- 3 CELADE & FILAC (2020). The indigenous peoples of Latin America - Abya Yala and the 2030 Agenda for Sustainable Development - Tensions and challenges from a territorial perspective. Available at: http://repositorio.cepal.org/bitstream/handle/11362/45664/17/S2000125_es.pdf. The Indigenous peoples referred to in the cited text are largely the repositories of the cultural diversity of this country and in this diversity that characterizes them we find very different peoples, with differentiated social and kinship structures, with more or less open identities depending on their geographical location, their relationship with other cultural identities and their demographic weight in the region or even the country they inhabit. Each town has its own traditions with its own worldview and a particular history. However, they have common elements of survival, their relationship with the land and territory; they generally enjoy community authorities and their own jurisdictions as well as health systems based on their knowledge and traditional knowledge UC 3 (2017). Regional Study: Challenges and Proposals for the Economic Development of Indigenous Peoples. Dr. J. Daniel Oliva Martínez (dir.). Mateo Martínez and Adriana Sánchez (coord.) Research team: Juan Collque (Bolivia) / Mirna Cunningham (Nicaragua and Mexico) / Luis Maldonado (Ecuador) / Mateo Martínez (Peru) / Andrés Marroquín (Guatemala) / Andrés Matta (Chile) / Carlos Perafán (Chile and Colombia case studies).
- 4 Annex I: Map of Community and Original Lands.
- 5 CELADE & FILAC (2020). The indigenous peoples of Latin America - Abya Yala and the 2030 Agenda for Sustainable Development - Tensions and challenges from a territorial perspective. p. 170.
- 6 The concept of NBS in this area could be associated with the way of life based on Indigenous peoples' socio-environmental resilience with the biosphere, which can be expressed as living in balance with nature.
- 7 CADPI, (2021). TDR for conducting case studies on Nature-based Solutions in Nicaragua and Bolivia.
- 8 UC 3 (2018) Regional Study: Challenges and proposals for the economic development of Indigenous Peoples. Op. Cit. In this environment, according to IWGIA (2021), the situation of indigenous territories in Bolivia once again reissued the heat sources, just like last year's voracious forest fires in the eastern region of the country. 7,144 heat sources were registered in 48 indigenous territories. CEJIS. "Report on heat sources accumulated between November 1 and 30, 2020." December 14, 2020. <https://www.cejis.org/reporte-de-focos-de-calor-acuminados-entre-el-1-y-el-30-de-nov-Diciembre-de-2020/>. This new disaster situation added to the pandemic, which put several Indigenous peoples in crisis. Such is the case of the Ayoreo people who generated a significant migration from their titled territories. PRAY Bolivia. "Recovery of the habitat of the Ayoreo people after the fires in the Chiquitanía and Chaco región." 2020, WWF Bolivia, Santa Cruz de la Sierra. Similarly, the impact on families in a state of voluntary isolation in the Chaco region in the jurisdiction of Charagua Iyambae, where it is being proposed to rethink the areas identified for the protection of these peoples, given the almost total destruction of the forests that were occupied.
- 9 A review of 130 local studies in 14 countries, jointly produced by the Rights and Resources Initiative (RRI) and the World Resources Institute (WRI), found that forests managed by Indigenous and Tribal Peoples suffer less deforestation and accumulate more carbon. Another international study showed that state-protected areas are deforested four times faster than neighboring community forests.
- 10 Oxfam, the International Coalition for Access to Land, Rights and Resources Initiative. 2016. Common Territory. Guaranteeing rights to land and protecting the planet. Oxford: Oxfam.
- 11 FAO (2020). FAO Regional Strategy for the Social Inclusion of Indigenous and Tribal Peoples in Latin America and the Caribbean.
- 12 These reflections have also been taken into account by the Team of Bolivian researchers on Climate Change at the PSB's Vice-Presidency's Center for Social Research.
- 13 These reflections, Ibid.

- 14 For that purpose:
“(a) Holding the increase in the global average temperature to well below 2° C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 ° C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
(b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and
(c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”
- 15 CADPI, (2021). *Ibidem*.
- 16 Mechanism for dynamic financing solutions at a global level.
- 17 United Nations Framework Convention on Climate Change Conference of Parties.
- 18 CADPI, (2021). TDR to carry out case studies on Nature-based Solutions in Nicaragua and Bolivia. Extracted from the global discussion document from global-level caucuses, as a result of the contribution of various authors.
- 19 CADPI, (2021). *Ibidem*.
- 20 CEPAL (2014).
- 21 FILAC-FIAY (2020). Indigenous Peoples in the face of the COVID 19 pandemic. Third Regional Report. Indigenous communities show the way.
- 22 AFD - IUCN - CEM (s. F.) Global Standards on Nature-based Solutions.
- 23 CIPCA (2020). Contribution of Production Systems to Mitigation and Adaptation to Climate Change in Six Regions of Bolivia. “Socio-environmental benefits achieved through the CIPCA Productive Economic Proposal; Criteria analysis of the Green Climate Fund ”(Main source used for this section).
- 24 Since 2008, since the publication of the Bolivian position in the Conference of Parties... The Bolivian proposal has focused on the fact that the negotiations “(...) should be based on a mechanism for direct compensation from developed to developing countries, through a sovereign implementation that ensures a broad participation of local communities and indigenous peoples” (Morales, 2008, p. 7., in Pacheco 2013).
- 25 Bolivia approves and promotes the "Joint Mitigation and Adaptation Mechanism within the framework of Comprehensive Forest Management" as an alternative to the official UN instruments based on the carbon market such as REDD +. The best strategy to avoid deforestation and degradation of native forests was to guarantee collective rights to lands and territories. (CMPCC, 2010).
- 26 MDRyT, (2010).
- 27 San Miguel is a community inhabited by indigenous Tacana; it is 208 meters above sea level in the municipality of San Buenaventura, Iturralde province in the north of La Paz.
- 28 Buffer Zone: Its objective is to minimize impacts on the PA's natural environment. This zone is made up of peripheral areas to the intangible zone where, through the regulation of uses and activities, possible negative impacts, risks or environmental damage are mitigated. Consumptive or extractive activities are excluded, and extensive controlled ecotourism and scientific research may be developed, including scientific collections (D.S. 24781 General Regulation of Protected Areas, Chapter IV On Zoning, Art. 31).
- 29 In 1997, CIPTA filed with the Agrarian Reform Institute (INRA) a claim for Community Original Land (Tacana I Community Original Land) on behalf of 20 communities (621 families, 2,849 inhabitants), located on the southeastern edge of the Madidi protected area.
- 30 TACANA INDIGENOUS PEOPLE. <https://bolivia.wcs.org/es-es/iniciativas/gesti%C3%B3n-territorial-ind%C3%ADgena/pueblo-ind%C3%ADgena-tacana.aspx>.
- 31 *Ibid*.
- 32 As explained by Hernán Nay, manager of Sales and Reserves of the venture in which training was key for the entry of the Tacanas into experiential tourism. <https://www.la-razon.com/financiero/2015/09/06/tacanas-trazan-estrategia-para-potenciar-el-ecoturismo/>.
- 33 San Miguel del Bala received an international award from the ToGo Foundation during the ITB World Tourism Fair in Germany. The “San Miguel del Bala” community tourism venture, located in the Madidi National Park, was awarded as one of the most relevant initiatives of 2011. According to the Vice Minister of Tourism, San Miguel del Bala stood out "as a model undertaking which is worthy of being awarded." He also recalled that it was the first time that Bolivia has received such an award. <https://www.boliviaviajes.org/2012/03/turismo-comunitario-premian-en-alemania.html>.

34 Pawanka Fund and FILAC, (2021).

35 The theoretical conception of sustainable tourism was adopted at the UN World Conference held in Lanzarote, Canary Islands, Spain, in April 1995, because tourism as a worldwide phenomenon implies the highest and deepest aspirations of the peoples for their social, economic and political progress. The United Nations Conference (1995) recognizes the need to develop tourism that satisfies economic expectations and environmental requirements, which is not only respectful of the socio-economic and physical structure of each destination, but also of the host populations that have the need to establish effective alliances between the main actors involved in tourism activity in order to forge the hope of a more responsible tourism with the common heritage. Degree thesis 2017. Political Strategy of the Plurinational State of Bolivia to Strengthen Tourism Development. Find at: <https://repositorio.umsa.bo/bitstream/handle/123456789/15268/647.pdf?sequence=1&isAllowed=y>.

36 In other words, leverage is the conjunction of efforts in one direction to achieve much more effective results for the benefit of entrepreneurs. Leverage and synergy are inherent components that are developed through an adequate and intelligent mediation of messages built into the signaling of tourist destinations and the creation of information regarding tourist attractions.

37 In the current Government Program it is proposed that you cannot experience Good Living if others live poorly, advancing actions that promote progress without leaving any family behind. In order to achieve economic and social practices guided by community practices, it is proposed to promote an economy that respects life and nature, based on the principles of solidarity, reciprocity and complementarity. In the context of Pillar 12 of the Patriotic Agenda (2020-2025).

38 <https://www.presidencia.gob.bo/index.php/viceministerios/vcmssc>.

39 GTI, (2017). The Environmental Economic and Sociocultural Value of Indigenous Territorial Management in the Great Madidi Landscape. Executive Summary. Editors: Consejo Indígena del Pueblo Tacana (CIPTA), Central Indígena del Pueblo Leco de Apolo (CIPLA) and Wildlife Conservation Society (WCS). The environmental, economic and sociocultural value of indigenous territorial management in the Great Madidi Landscape Executive summary. 2017: 15-16.

40 https://www.eldiario.net/noticias/2017/2017_02/nt170217/politica.php?n=58&-bolivia-logra-recursos-del-fondo-verde-para-proyectos-de-agua.

41 AFD – UICN – CEM (s. f.) Global Standards on Nature-based Solutions. The emphasis is personal.

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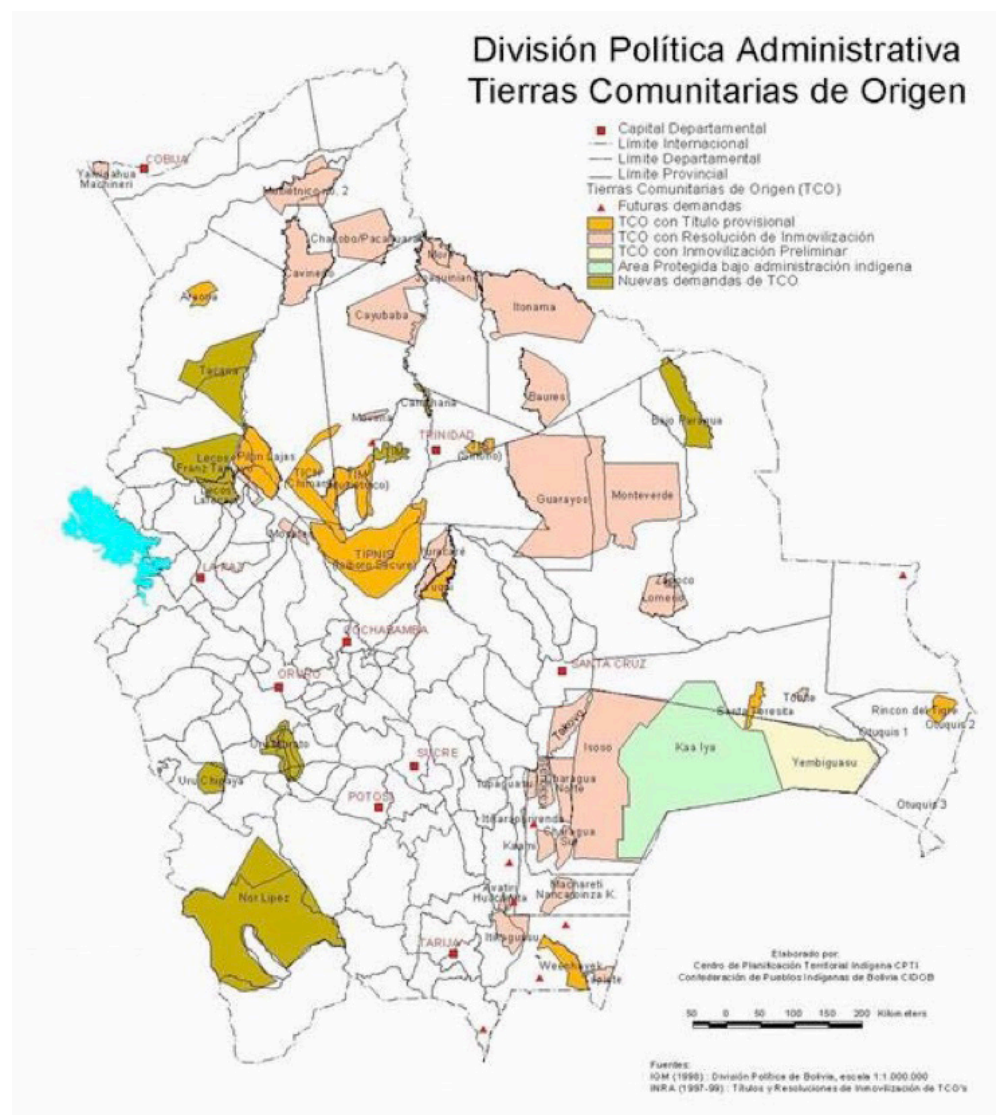
- AFD-UICN-CEM (2019). Norma Mundial sobre las Soluciones basadas en la Naturaleza. Disponible en: https://www.iucn.org/sites/dev/files/content/documents/2019/global_standard_for_nature-based_solutions_spanish_2.pdf.
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Annex

STATUTE ON INDIGENOUS LANDS IN THE PLURINATIONAL STATE OF BOLIVIA



Map 1: Administrative Political Division a. Native Community Lands. Source: CPTI-CIDOB. https://www.google.com/search?q=TIERRAS+COMUNITARIAS+DE+origen+EN+BOLIVIA&tbm=isch&source=iu&ictx=1&fir=6qFJVSIShdIOX-M%252CqC9y4twpvve48M%252C_&vet=1&usg=AI4_-kRhEhtHxf0rD_UpLbWYmY-5kTH-NYQ&sa=X&ved=2ahUKEwic66uI7_wAhVfqpuCHZZ-ABEQ9QF6BAGOEAE&biw=1360&bih=667#imgsrc=9Pd9dOEplaj8AM.

Nicaragua: Karata Indigenous Territory in the Autonomous Region of North Caribbean Coast

By Center for the Autonomy and Development of Indigenous Peoples

INTRODUCTION

Climate change represents a multiplying and magnifying factor of social, economic and environmental problems. Natural events, magnified by climate change, multiply their negative effects on the goods and assets of people, communities and societies as a whole, affecting life, health, production, infrastructure and quality of life while increasing the vulnerability and poverty that are ever present in indigenous communities.

For this crisis, it has been argued that Nature-based Solutions (NBS) hold enormous potential to contribute in addressing the environmental problems caused by climate change. In this regard, different voices have affirmed that among global actors Indigenous peoples have contributed the most to the preservation of ecosystems in the face of climate change but also suffer the most from its consequences due to their particular vulnerability. Their economic systems, some based around subsistence, provide for the well-being and sustenance of their balanced collective lives. However, the consequences of climate change are threatening their exercise of their rights because they limit their ways of life, which depend on nature. Thus, climate change impacts their sociocultural practices. Nature-based solutions are becoming an opportunity if actors, such as environmental organizations, private entities, international financial agencies and States themselves, take up the experiences of indigenous communities or include the indigenous communities themselves in their strategies to adapt to climate change from local to global level.

For Indigenous peoples, this potential can only become a reality if States correctly frame and apply NBS in public policy. This would entail NBS based on the rights of Indigenous peoples— their human rights and their rights as Indigenous peoples— recognizing their access to their lands, forests, waters, and territories as well as their knowledge, traditional practices and innovations, and their general contributions to protect and maintain the environment, including adaptation to and mitigation of climatic conditions.

Nature-based solutions, as they are defined, refer to “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively simultaneously providing human well-being and biodiversity benefits.” (IUCN, 2016)

Increasingly, many international mechanisms refer to NBS as “new” climate change solutions, which give primacy to carbon as a commodity.

Indigenous peoples maintain that nature-based solutions are not new climate actions and that they should not be centered around carbon. They have practiced nature-based solutions as a concept in their territories for centuries, and these actions have led to the conservation of the planet’s biodiversity as a whole. This is the position which holds the interest of Indigenous peoples on NBS; thus the paradigm must shift and demonstrate that Indigenous peoples as subject to their rights are the center of these debates (Cunningham *et al.* 2020).

The main objective of this study is to demonstrate how Indigenous peoples contribute through their lifestyles and ancestral knowledge to nature-based solutions in their lands, territories, and resources, as well as define the elements and components of what constitute NBS from their perspective. The study also presents recommendations on how Indigenous peoples can incorporate nature-based solutions in global and national discussions.

This case study from Nicaragua, using as reference the Karata territory in the Northern Caribbean Coast Autonomous Region, was carried out in a collaborative, cross-sectional manner based on the Indigenous perspective and worldview of the Miskitu people. It was reinforced with secondary information drawn from sources such as publications about the territory on topics related to the study subject and information gathered through field visits and communication with territorial and community leaders.

SOCIODEMOGRAPHIC CONTEXT OF STUDY AREA

Nicaragua is a multiethnic and multicultural country. Article 5 of the Political Constitution establishes multiethnicity as a principle of the nation. It recognizes the collective identity of Indigenous peoples, thus establishing their right to maintain and develop their identity and culture, have their own forms of social organization, manage their local affairs, and maintain their communal forms of ownership of their lands and the enjoyment and use of their lands and resources. It also establishes autonomy, regional and multiethnic in scope, for the Indigenous peoples and ethnic communities living in the former Moskitia. Thus, the Constitution recognizes the individual and collective human rights of Indigenous peoples, especially the right to freedom and self-determination.¹

The country is organized into fifteen departments and two autonomous regions. Its geography can be divided into three regions. The first is the Pacific, which has high ecological risk and high population density, with the Managua department having 152 inhabitants/km². The Northern Central Region is predominantly rural and has an agricultural economy and a population density of 48 inhabitants/km². The Caribbean region covers 46% of the country’s territory, is mostly rural and sylvan, has a low population density (10 inhabitants/km²), has the greatest indigenous population, lowest rate of education, limited road access, and is disconnected from the rest of the country. (Ortega S. 2009)

There are seven Indigenous peoples in the country, with the Chorotega and Miskitu being the most numerous, and two known Afro-descendant peoples, the Kriol and Garifuna. They are distributed in the Pacific-Center-North, the Autonomous Regions² and the Alto Coco-Bocay special zone. According to the 2005 Census data, most of the traditionally indigenous municipalities now have multiethnic composition.

The normative framework of reference for Indigenous peoples is established in three instruments: the Political Constitution, the International Labor Organization Convention 169, and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP).³ The specific reference frameworks for Indigenous peoples and Afro-descendant communities in the Autonomous Regions are the Statute of Autonomy of the Communities of the Atlantic Coast, Law No. 28⁴ and its Regulations,⁵ which contain, among other norms, the attributes of their bodies of government, their relation-



Territories in the Caribbean and along the Alto Wangki and Bocaj Rivers

ship with the executive and legislative branches and with the municipalities, and the exercise of their rights.

Law 445⁶ approved in 2003 regulates the communal property system of Indigenous peoples and ethnic communities of the Autonomous Regions of the Atlantic Coast of Nicaragua and the Bocay, Coco and Indio Maíz Rivers. This law strengthens the autonomy regime, since it incorporates aspects related to the relations between the communities and the different levels of government and reaffirms the historical competence of the communal and territorial authorities. As a result of the application of Law 445, there are 23 titled indigenous territories totaling 371,841 km², which correspond to approximately 31% of the national territory.

The Karata territory is located in the North Caribbean Coast Autonomous Region (RACCN) in the northeast of Nicaragua.

STATE OF NATURE-BASED SOLUTIONS

Nature-based Solutions is a new concept that encompasses actions that rely on ecosystems and the services they provide to respond to various societal challenges such as climate change, food security or disaster risk. Among the concerns expressed by Indigenous peoples in debates regarding the subject is that indeed until now the exemplification and conceptualization of Nature-based Solutions have come mainly from the large conservation organizations.

NBS approaches can be used in combination with other types of interventions. For example, food security challenges can be better solved by combining NBS (such as agroforestry systems or wetland restoration) with more conventional solutions (such as improving distribution and access to food or trade policies that support local producers).

These approaches can also generate manifold benefits for local populations and for biodiversity while simultaneously being a trustworthy measure to strengthen resilience in the face of climate change. While the traditional approach to infrastructure development is “gray” involving built and artificial structures, nature-based solutions encompass natural, green and integrated infrastructure, which combines many elements. Nature-based solutions are decoupled from the construction of dikes, reservoirs, dams and drainage systems; they would opt for a gray infrastructure approach for certain climate risks.

On the other hand, nature-based solutions could, for example, include, restore and conserve coral reefs and mangrove belts to improve resilience to coastal flooding and sea level rise, improve vegetation to reduce risks of landslides, and create permeable green areas to help replenish groundwater in regions facing water shortages.

Nature-based solutions directly address a potentially unsustainable over-reliance on gray infrastructure, which presents a two-pronged problem: gray infrastructure relies on the use of often non-recyclable and finite resources and is often temporary. Nature-based solutions have a greater resilience to climate change than gray approaches and additionally have lower initial capital, operating and maintenance costs. As climate risks increase and intensify, gray solutions will need to be improved or replaced.

Nature-based solutions also require maintenance and sometimes need to be restored but not to the same extent, so they can be more versatile than their gray counterparts. By maintaining and restoring natural elements, NBS projects help conserve the environment, create habitats for endangered species, reduce carbon emissions, and restore natural aesthetic beauty in communities.

Despite the above, natural capital has not been systematically incorporated into decision making and planning, and it has been argued that governments do not always recognize the dependencies or economic contribution of natural capital. This means that countries are losing a key benefit of nature-based solutions: their economic value.

Although nature-based solutions were featured as one of the six priority action portfolios by the United Nations Secretary General at the 2019 UN Climate Action Summit, gray infrastructure remains the traditional standard.

Debates regarding nature-based solutions are taking place, but not all interest groups are at the table, as raised by some institutions such as the Inter-American Development Bank (IDB). It has been argued that in business, nature is often viewed as an issue for Sustainability or Corporate Social Responsibility teams rather than an issue for Executive Management groups, and as relevant to conservation organizations instead of project developers and professional associations.

The financial community also plays a crucial role. Leveraging private sector investment requires project developers to identify the revenue streams generated by the nature-based solutions component and incorporate them into the financial structure of future projects. Having a clear business case will unleash the untapped potential that nature-based solutions bring to our region. In the interest of demonstrating that there are ways to monetize benefits, the IDB is also investigating successful case financing models and structures in Latin America and the Caribbean to shed light on this important dimension.

Referring specifically to Latin America and the Caribbean, the IDB report also found that nature-based solutions are often not integrated into policies, legislation and regulations. In other parts of the world this is not the case. In the European Union, for example, there are legal requirements for project developers to consider “reasonable alternatives” as part of their environmental assessments.

This means that it is necessary to further sensitize the whole world about nature-based solutions but especially the regions most affected by climate change. This requires having a solid business case, providing project members with improved tools and methodologies, and developing and implementing adequate financing and insurance mechanisms, according to IDB.

The topic of nature-based solutions thus must be transversal and interrelated in Indigenous peoples’ strategic negotiations regarding Sustainable Development Goals, climate change and biodiversity. And what has become evident is that NBS are actions that have always been carried out by Indigenous peoples due to their intrinsic relationship with nature, an approach that is reaffirmed by the fact that 80% of the planet’s biodiversity is protected by Indigenous peoples despite only 11% of their forests and resources being legally recognized.

As such, Indigenous peoples have recommended in discussions on NBS that recognition, respect, promotion and support of Indigenous peoples’ perspectives, priorities and rights be guaranteed.

They have also underscored that in the conservation of ecosystems their traditional knowledge has played a fundamental role, either to “adapt” to climate change or to maintain biodiversity in their territories. This knowledge is framed in a cosmogonic and holistic vision of respect for life, which considers nature as sacred and recognizes humanity as an integral part of it. Under this approach, the balance of the environment in which people live is guaranteed while continuing to ensure access to necessities such as water, air, fertile land, food, housing and medicines.

Indigenous peoples, taking a Nature-based Solutions approach, have faced not only climate change but also food insecurity and disaster risks, therefore their experiences can be an important frame of reference to be integrated into the policies and actions of different entities and States.

It is important to highlight some concerns that Indigenous peoples have raised throughout the debates on the subject of Nature-based Solutions:

- Land tenure rights and the contributions of traditional knowledge must be central to the debate. Past experiences have shown that applying narrow conservation approaches that isolate people from nature can reproduce painful and unjust displacements from communities.
- The relationship between disparate nature-based solutions needs to be considered, particularly as they relate to land or soil degradation and chemical farming methods or monocultures. Thus, coherence between national policies is required. Governments, the business sector, Indigenous peoples, and society as a whole need to reconcile interests, seek to avoid or resolve conflicts, and find respectful forms of collaboration, including aspects related to cross-border Indigenous peoples, which require regional measures.
- There is great interest in the topic of NBS for sustainable development and climate change but little discussion about the importance of ecosystem diversity. Much emphasis has been placed on forests, leaving aside other ecosystems.

NATIONAL POLICY AND NATURE-BASED SOLUTIONS

In this regard, Nicaragua has signed a series of International Environmental Agreements for the conservation and sustainable use of resources drawn from Mother Earth’s biodiversity, among which the following stand out:

- Universal Declaration of the Common Good of the Earth and Humanity, Nicaragua being the first country in the world to join
- Convention on Biological Diversity signed in 1992, ratified on June 13, 1992 through Decree No. 56-95
- Convention against Drought and Desertification signed on October 14, 1994, ratified on October 29, 1997 by Decree No. 1795
- Convention on Wetlands of International Importance, especially as Waterfowl Habitat (RAMSAR), signed on February 2, 1971

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) approved through Resolution No. 47 of June 11, 1977 and ratified by Decree No. 7 of June 22, 1977
- United Nations Framework Convention on Climate Change signed on June 13, 1992, ratified by Decree No. 50-95 on September 29, 1995
- Cartagena Convention for the Protection and Development of the Marine Environment in the Greater Caribbean Region approved by Executive Decree No. 06-2005
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal ratified by Executive Decree No. 20-96 on September 24, 1996, with accession by Legislative Decree No. 1601 on February 6, 1997
- Vienna Convention and the Montreal Protocol for the Protection of the Ozone Layer approved on August 24, 1999, ratified by Decree No. 104-99
- Stockholm Convention on Persistent Organic Pollutants approved on September 23, 2005 by Decree No. 64-2005
- Rotterdam Convention on Prior Informed Consent Procedure Applied to Certain Hazardous Chemicals and Pesticides in International Trade approved on August 14, 2008 by Decree of the National Assembly, Number 5430

In 2007, the Presidents of El Salvador, Honduras and Nicaragua signed the Declaration of Managua established the Gulf of Fonseca as a zone of Peace, Sustainable Development and Security where a great wealth of marine and terrestrial biodiversity can be found.

The Political Constitution of Nicaragua recognizes in its 59th Article that Nicaraguans have the right to live in a healthy environment, as well as commits to its preservation and conservation. The third paragraph of this Article reads as follows: “We must protect and restore the integrity of ecosystems, with special concern for biological diversity and for all natural processes that sustain life.”

As a result of this regulatory framework, the Government of Nicaragua has developed a work strategy that harmonizes the conservation of ecosystems, species and genetic resources with food security and sovereignty, the development of communities and the rescue of the values of care and love for our Mother Earth. The vision is to achieve “Sustainable Development” to improve the living conditions of all Nicaraguans, restoring their rights and strengthening alliances for prosperity, reaffirming the commitment to guarantee tranquility and stability, in addition to the permanent search in the construction of Good Living for each Nicaraguan in harmony with the biodiversity resources of Mother Earth, promoting complementarity, unity and trust, bringing new hope to the population to strengthen the brotherhood and advance along paths of Common Good.⁷

Through the National Human Development Plan, the Nicaraguan Government promotes the use and management of biodiversity, such as contained in guideline 10: “The Productive Sector prioritizing the Family, Community and Cooperative Economy and Food Sovereignty and Security in a context of Change Climate,” which has the following strategies and policies:

- Strategy - Live Clean, Live Healthy, Live Beautiful to Live Better
- Food Strategy and Food and Nutrition Sovereignty and Security Policy
- Agricultural and Forestry Strategy for the growth of production with increased productivity
- Development of the Family, Community, Cooperative, Associative and the MIPYME (Micro, Small or Medium Business) Economy
- Industrial Policy and Promotion of Small and Medium Agroindustry
- Policy for the Promotion of Aquaculture and Artisanal Fishing
- Tourism Promotion Policy
- Mining Promotion Policy
- Policy for Organization and Prevention of Natural Phenomena and Climate Change

The National Strategy for the Protection of Biodiversity, in its Policies and Action Plans, defines the responsibility of Nicaraguans for the care and rescue of fauna, flora, and microorganisms to protect all biodiversity because of its significance to life, health and work. The National Strategy also calls for joint actions and efforts, mainly to take care of species at risk of extinction and to conserve and restore all the richness of the country's natural heritage.

The state institutions that have the constitutional mandate for the care and administration of natural resources are: the Ministry of the Environment and Natural Resources, Secretariats of Natural Resources of the Autonomous Governments of the Northern and Southern Caribbean Coasts, and Municipal Mayors.

Law 290 and its regulation "Law of Organization, Competence and Procedures of the Executive Power" establishes the functions of each state institution, which must comply with and enforce the provisions established by the national legal framework, propose sectoral policies, and complement sectoral legal frameworks. Under this law (Article 28), the Ministry of the Environment and Natural Resources (MARENA) has the following functions and responsibilities:

- Formulate, propose and direct the national environmental policies and, in coordination with the respective Sectorial Ministries, the sustainable use of natural resources
- Manage the Environmental Impact Assessment System
- Manage the Protected Area System
- Formulate, propose, direct the regulation of the sustainable use of natural resources and their monitoring, quality control and proper use
- Coordinate with the Ministry of Agriculture and Forestry on sector planning and policies for the sustainable use of agricultural, livestock and forestry land
- Coordinate with the The Ministry of Development, Industry and Commerce (MIFIC) sectoral planning of the sustainable use of natural resources
- Supervise compliance with international agreements and commitments in the environmental area
- Formulate and propose environmental education content

To act according to this mandate, MARENA has 17 territorial Delegations and four General Directorates. The latter are the Directorate of Environmental Quality, Directorate of Climate Change, Directorate for Coordination of Territorial Delegations, and Directorate of Natural Heritage. Through alliances with other local and national institutions, they implement actions and strategies to develop effective environmental management for the conservation and sustainable use of biodiversity in the face of variability and climate change.

Law 28, which defines the autonomy of the two Autonomous Regions in Article 9, recognizes the rights of the communities which live in their ecological systems for the rational exploitation of their resources through mining, forestry, fishing within the Autonomous Regions and established recognition of property rights over communal lands. Based on this legal framework, all the territories and their indigenous communities establish their own norms, statutes and strategies to use, manage and live in their own ecosystems in a rational and sustainable way, in accordance with their systems of customs and traditions and livelihoods.

Likewise, Law 445 “Regime of communal property of the indigenous peoples and ethnic communities of the Autonomous Region of the Atlantic Coast of Nicaragua and the Bocay, Coco, Indio and Maíz Rivers” makes operative Article 89 of the Political Constitution that establishes State recognition of the communal forms of property of the lands of the Indigenous peoples and Ethnic Communities of the Atlantic Coast. Article 31 determines that the Nicaragua Government, the Autonomous Regions and the municipalities must respect the real rights to the communal lands that these Indigenous peoples and ethnic communities have traditionally occupied as well as over the natural resources they have traditionally used.

The Autonomous Region in the face of climate change has created the Regional Plan for Mitigation and Adaptation to Climate Change, which seeks to strengthen traditional systems and communities’ livelihoods. Through the Plan, the Regional Government adopts traditional knowledge systems and some lines of work that highlight ways to strengthen practices and production systems traditionally applied by indigenous communities. Through this safeguard policy, the Region has embodied in the development plan of the Caribbean Coast an environmental management framework (AMS), which emphasizes environmental assessment for any exploitation activity, be it forestry, fishing, livestock to determine the impact on the environment and possible mitigation proposals for effects that would directly cause climate changes.

KARATA: STRENGTHENING COMMUNITY/TERRITORIAL GOVERNANCE TO ENSURE BIOCULTURAL LINK, PRESERVING TRADITIONAL KNOWLEDGE, PRACTICES AND LIVELIHOODS

The Indigenous and Afro-descendant territory of Karata has a territorial extension of 37,471 square hectares. It is made up of five indigenous communities: Karata, Lamlaya, Dakban, Wiwas and the city of Bilwi, which is of indigenous and Afro-descendant composition, although in recent decades the presence of a mestizo population has grown there. The territory is identified as indigenous and Afro-descendant as a result of the historical relationship between the two peoples.

The titling commission of 1905, created by the Government of Nicaragua when it annexed the Moskitia to Nicaragua, recognized the territory of Karata, which since the Harrison-Altamirano Treaty has accumulated experience in the administration of its communal property. Law 445, which recognizes its land title, guarantees communal property rights of domain and possession, usufruct and territorial administration.

Karata, as a community and territory, has had an industrial development link for more than 100 years. In its territory Puerto Cabezas was established one of Nicaragua's main maritime ports for mining and forestry exports in the last century and it was also the headquarters of transnational companies such as Bragman Bluff Company, Standard Food Company, among others. Today it is the municipal seat of the Autonomous Region and as such is the main center of goods and services.

Despite more than a century of a strong urban-rural relationship, the Karata community has maintained traditional knowledge systems and ways of life. It has continued to practice fishing and agriculture as a subsistence economy, relying heavily on wetlands, floods and its gallery forests. It has maintained its production system for both food and medicine, maintaining the community standard of living based on a biological-cultural relationship due to a broad link with the ecosystem.

Coastal-Marine Characteristics

The territory of Karata is located in the Cayos Miskitu Biological Reserve that extends between the municipalities of Waspam, Puerto Cabezas and Prinzapolka. It has an approximate area of 8,500 km² comprised of a land strip 20 km wide from Cabo Gracias a Dios to the northeast to the southern part of the community of Wouhta and a marine portion delimited by a circle with a radius of 40 km from the center of Cayo Grande of the Cayos Miskitus at coordinates 82° 46' west longitude and 14° 23' north latitude.

The vegetation cover of the Cayos Miskitus Biological Reserve includes 15 ecosystems in 384,496 hectares, which include 98 hectares of populated centers. The reserve presents a great diversity of coastal-marine environments, which are home to one of the largest extensions of seagrass in the Caribbean and intermixed with coral reefs.

The presence of coral, mangrove and seagrass ecosystems makes it a center of rich biological diversity, which facilitates very effective conversion of sunlight into plant tissues and subsequently into animal tissues. The high diversity of habitats has allowed for the establishment of feeding, reproduction, breeding, and spawning of a large number of species. It has a continental shelf more than 100 miles out to sea. The reserve's mangroves, with a mangrove forest area estimated at 24,200 hectares, are essential to maintain the biological cycles of the associated biodiversity, which includes numerous species of commercially valuable fish such as snook, king shad, grunts and snappers, as well as lobster and shrimp. Furthermore, the mangroves serve as a refuge for the waterfowl food base.

From a standpoint of conserving biodiversity and maintaining local economies, coastal lagoons are extremely important habitats. Their role in maintaining the life cycle of coastal-marine organisms including species for commercial fishing is invaluable.

The hydrographic basins of the Caribbean coast drain 90% of the national territory's water flow. The habitats and lagoons of the region are the recipients of many of the impacts derived from the actions carried out in the interior of the country, in such a way that the region suffers the consequences of mismanagement and deforestation carried out in agricultural activities that contribute significantly to habitat destruction.

These lagoons are of strategic importance because they are a source of food for species essential to the economic sustenance of the constituent communities, such as shrimp, lobster and fish of different species that are caught there. There are also other species with less economic potential, which serve to preserve the ecosystem and those in danger of extinction, such as manatees. These areas are also a sanctuary for native and migratory birds such as ducks, pelicans, pigeons, among others, and nurseries for various species of freshwater turtles, snails, crabs, among others.

The soils of the Karata territory are clayey, sandy and swampy, since the area has a humid tropical climate. The lands located in the Kruwarban sector, covered by broadleaf forests and open coniferous savannas, are suitable for agriculture; they are deep, well-drained soils with a pH of between 4.5 to -5. In broadleaf areas and in pine forest and micro forest savannas, the soils are acidic with a pH range of 3.5 to 4 and shallow with a high concentration of iron, aluminum, magnesium. The territory's topography is generally undulating to semi-undulating with slopes ranging from 0 to 269 meters above sea level, with rainfall ranging between 2000-2500 mm/year although this can sometimes go up to 3500 to 4000 mm or decrease depending on the extensions of winter or summer. Its average temperature is 23° C in the early morning and 32° C during the day.

Nature-based Solution experience

The NBS experience in Karata consists of the measures taken by the community to strengthen its governance, ensure its biocultural link, and preserve its traditional knowledge, practices and livelihoods. The characteristic aspects of this experience are the following:

- Strengthening territorial and community governance
- The indigenous and Afro-descendant territorial government of Karata has the following territorial organization:
- Territorial Assembly (Board of directors and assembly members previously well defined)
- Territorial Authority or Indigenous Territorial Government (Administrative Executive of the Territory)
- Communal Authorities (Wihta and Board of directors)

Each community in the territory, with the exception of Bilwi,⁹ has its traditional communal leaders and other internal authorities. Other organizations that arise according to the circumstances to respond to certain conditions also exist; however, the structures that always remain in the territory's communities are the Wihta and the Council of Elders. In the case of teachers, priests, nurses and knowledge-bearers of traditional medicine, they are considered communal authorities and enjoy a distinctive status among the other members of the community.

The Wihta is elected annually by the communal assembly and is certified by the North Caribbean Coast Autonomous Region (RAAN). They are the highest authority in their respective communities. To occupy this position, a series of criteria established by the community, which are not necessarily written rules, must be met such as: having a stable family, having moral values, demonstrating good behavior and commitment to their community, and having the approval of the communal assembly. Knowing how to read and write is not an essential requirement.

This community authority counts on a body of community police, which it relies on to carry out its functions and management within and outside the community. The main role of the community police is the application of customary justice.

Although the governance system is complex, conflicts between territorial and communal authorities are reduced, because there is only one Territorial Trustee who acts as Territorial President and within the community the role of Wihta is assumed by the Council of Elders. This allows the Territorial President to disassociate himself from the administration of justice and to focus on the administration of natural resources and conservation of ecosystems.

In the communities, the respective authorities and their institutions are respected. Despite economic, social, political and other pressures, communities retain respect for their authorities. They maintain a systematic practice of a community that discusses, generates consensus and coordination, and once there are agreements, the authorities enjoy the support and respect of the members of the community for the exercise of governance.

For territorial administration, the following institutions and mechanisms exist:

- Territorial statute that guarantees institutional functions and territorial governance

- Institutional capacity installed, strengthened; implementing territorial management¹⁰ through financial administrative units that have been installed and are functioning, as well as technical personnel trained in management and planning and have demonstrated capacity in formulating, managing and implementing social, productive, infrastructure projects
- Territorial and community governance office infrastructure in good condition, with their own land transportation means
- Women's office linked to the territorial government promoting and managing women's rights in favor of the women of the territory¹¹
- Technical unit for the administration and control of communal property in operation; experience in collecting income, especially in the concept of land/land leasing, generating a significant budget for territorial and community governance
- Ministry of Finance and Public Credit (MHCP) income for institutional strengthening and public investment within the territory
- Strengthened institutional governance, guaranteeing implementation of plans, programs and projects
- Capacity building in managing territorial governance and efficient administration of communal property.

Ensuring biocultural link through policy establishment

The communities of the Karata indigenous territory, through their Indigenous Territorial Government (GTI) authorities, have established control standards in accordance with regional regulations for community artisanal fishing. For this, they act according to the following elements: protect the fishing resources as populations (snook, croaker, crab) for their food sovereignty, both those for commercialization in the local markets as well as all those species for self-consumption within the community.

To protect these resources, they have created a closed and open season system. This system was established in 1999 and was approved by the Autonomous Regional Council that same year as part of the lagoon management measures within the Biological Reserve of the Miskitus Keys. They have included two new additional elements. One is the protection of sensitive ecosystems to conserve the quality of fishing production, which entails regulations on the management of mangroves and wetlands. The other is to regulate the arts and methods of fishing. For example, fishing with light nets or small openings is prohibited as is the use of chemicals. What these norms also consider are the conditions of access to control and regulate fishing. The norms are created by the community members themselves and have a communal, intercommunal and territorial structure regarding the power to monitor and ensure compliance. This includes penalties and fines for non-compliance. In the same way, they have established norms for the use and management of the mangroves, prohibiting any cutting of mangrove within 100 meters from the shore of the lagoon and its center.

Conserving traditional knowledge, practices, and ways of life

The Karata community maintains a series of practices and customs derived from their traditional knowledge. Traditional medicine being a pillar of their ecosystem management, the community maintains a high degree of defense and use of its traditional medicine system.

For community members, the term, nature-based solutions, is conceptualized as every form of existence that the ecosystem has and how these are managed for the benefit of each family in the community. In economic terms, for example, it is recurrent to find certain practices among the inhabitants that satisfy needs such as housing, hunting, fishing, in addition to the use of traditional medicine. In a complementary relationship, everything lives and everything is important. Mother Earth has cycles, sowing seasons, harvest seasons, rest seasons, tilling seasons, and periods of natural fertilization.

The main source of income for families of the communities in the territory comes from fishing. According to the survey by Foundation for the Autonomy and Development of the Atlantic Coast of Nicaragua (FADCANIC) (2020), 90.26% of fishing production is dedicated to sale, the remaining 12.20% to self-consumption. Of the marketed product, 60.8%¹² of the families obtain incomes that fluctuate between US\$ 3.00 and US\$ 5.00 a day, and 33.0% more than US\$5.00 dollars a day. That is, 93.8% of families enjoy daily incomes that exceed US \$3.00. (FADCANIC, 2000)

Fishing activity is carried out by families almost all year round, except in the months of June, July and August, depending on the weather. Winter is considered the high season for fishing and lasts from June to December. The low season is between the months of January and May, coinciding with the summer season.

Given the geographic location of the communities, families fish in the sea, lagoon or river. Fishing varies throughout the year according to conditions such as the weather, species or closed season. In the sea, fishing is carried out throughout the whole year (69.1%), with a prevalence in the summer season.

Health and environmental impacts, response to climate change and sustainable development

Despite Karata being located in a coastal zone of flooded forests, the community has products from the community agroforestry system that allows them to have a good source of protein. The people have not resorted to chemical fertilizers or pesticides but instead conserve the natural ways of organic food production.

The system of regulations that defines the rules of land use practiced by the community contributes to reducing environmental degradation, consolidating their food security and sovereignty, strengthening their livelihoods, and aids the communities in becoming more resilient to the impacts of climate change. The community maintains sustainability of natural, food and economic activities, such as fishing, aided by the adoption of related measures. While their main source of fuel for food is firewood, for instance, the communities have put in place measures to reduce de-

forestation of the mangroves. Another measure they took was to maintain backyard agriculture in which each family grows vegetables, root crops and fruit trees. This has evidently had a positive impact, since the prevalence of horticulture and vegetation within the community allowed for a source of food and prevented total destruction during the two category 5 hurricanes the region suffered in November 2020. The community also tried to diversify to reduce the pressure from climate change through promotion of community ecotourism, but it has not been very successful because the capacity and infrastructure for it do not yet exist in the territory.

In relation to health care, in particular childbirth, a combination of traditional and Western medicine has traditionally been used, according to a community midwife. In case of complications, arrangements are made for the transfer of the patient from the community to the city of Bilwi, with the transfer being coordinated by the community midwives after being assessed by the traditional doctors. A series of practices and rituals that include herbs, baths, potions and invocations to spirits are used by traditional doctors, knowledgeable elders, midwives, healers, shepherds in the exercise of the Faith, all this in order to clinically and psychologically stabilize patients. According to Carlos, a young man from the Karata community, each family head has some knowledge of traditional medicine that has been acquired and transmitted from generation to generation from their ancestors.

National Policy Support

The State of Nicaragua, through Ministry of Environment and Natural Resources (MARENA) and Nicaraguan Institute of Fisheries and Aquaculture (INPESCA), has developed a series of regulations on the use of different types of fishing gear in the lagoon, which the community through a solid institution of governance follows. The community's regulation effort is coordinated with MARENA, Department of Natural Resources (SERENA) and the Karata Indigenous Territorial Government.

INDIGENOUS PEOPLES' PARTICIPATION IN LOCAL AND NATIONAL POLICY MAKING

Local/territorial Level

The communities of the Caribbean Coast Autonomous Regions of Nicaragua are connected and active through various initiatives and inter-institutional mechanisms for development and participation in public policies. Broadly speaking, the contributions to NBS that emerge from the communities, in the case of Karata, occur in at least three spaces for participation:

Local space: Karata has had a structure of participation for 20 years - the Lagoon Management Committee. Although the Karata lagoon is constituted mainly by the communities of Karata, Lam-laya, Dakban as users of the waters for fishing and of the wetland and mangroves, it shares a key area in that lagoon - the bar that belongs to the Wawa Bar community, which is part of another territory, Prinzu Auhya Un. The Lagoon Committee, created in 1999, has legal status, being recognized and approved by the Autonomous Regional Council through a Resolution. It is the space for inter-communal representation in the territory through participation via voice and vote, which the Wawa Bar community joins.

Regional level: The other platform where the various territories are represented is the Environmental Forestry Advisory Committee (CCF-A) created by the Autonomous Regional Government. This is the official regional platform for participation in such processes as the design, consultation and approval of management plans for the Miskitu Keys Reserve. As Karata is one of the Territories in the Reserve, it has representation in this committee with two other territories, Tawira and Prinzu Auhya Un, with which they share the management of the reserve. The territories reach agreements in the committee, sign and coordinate with various technical entities, but their governing platform is the Tawira and Prinzu Auhya Un regional government through SERENA and CCF-A.

Within governance framework of REDD+ program, which aims to reduce emissions from deforestation and forest degradation, the President of the GTI-A represents the Miskito communities. The president of the Karata territory is the representative delegated by the rest of the territories to bring the voice of the Miskitu people to the structure of REDD +.

National Level

In addition to the CCF-A platform, the Autonomous Regional Government has established a space for dialogue and consensus where all indigenous territories meet regularly and can discuss the implementation of policies and communication among the various stakeholders, ranging from interested internal actors, communal governments, some ministries, among others. At that regional table they address various issues, including cross-cutting issues such as; a) territorial se-

curity, b) protection mechanisms for traditional knowledge, c) safeguards for the right to natural resources and livelihoods of communities, d) improvement of the participation and representation of women in governance, among other issues that form the basis for national advocacy.

CONCLUSION

For Mendoza Lewis (2021), nature-based solutions are in the territorial roots; the community has ties and has appropriated the defense of its territory, especially in the face of urban pressure. Despite being the indigenous territory with the greatest urban pressure, the Karata community has strengthened its governance to ensure the people's biocultural link and protect their coastal landscape and wetlands as well as preserved their traditional knowledge, practices, and livelihoods.

This indicates that the community members are familiar with the term nature-based solutions. They use NBS according to their knowledge and daily practices; however, the indigenous worldview defines it—through spirituality—as coexistence, harmony, unity and good use of resources, all of which are elements of good living.

For Indigenous peoples, their territories and nature are seen as spaces for life where there are a series of social, cultural, productive and spiritual relationships, which together constitute the basis for survival and cultural identity and, above all, a vision of harmonious and respectful interactions between people and nature. For community members, the concept of nature-based solutions is based on the relationship between biodiversity and human necessities and well-being, which are fundamentally based on culture. This perspective has traditionally been the way of life of these ethnic communities. Traditional knowledge has been the basis for the relationships between Indigenous peoples with their lands and territories.

The concept, however, is not tied to money, says Stanford Thompson, deputy Wihita of the Karata community. For him, it is a daily practice that is not based on economic growth but on harmony between nature and human beings. It can thus be observed that for indigenous communities, nature has value which is not simply financial or economic. Seeing nature as an asset leaves aside the cultural and spiritual values of the Miskitu and Creole peoples who live there. For them, nature and the territory constitute the roots of the culture where their lives and identities develop and evolve day by day. The territory and its sacred spaces are elements that the Indigenous peoples claim, and the disappearance of these collective territories will have a direct impact on their existence as Peoples and on humanity.

The Territory's experience, in terms of governance, is valuable and can be taken as "positive experiences" related to nature-based solutions from an indigenous perspective, especially in the particular case of the marine-coastal areas in which the Indigenous peoples exercise their collective rights. It is important because the generation of income from the territory contributes to improving the living conditions of the people in its constituent communities. Likewise, the communal and/or territorial government is a key actor since, within indigenous governance, it defends their rights, guarantees collective property and ensures the exercise of their rights.

In terms of national norms and policies related to nature-based solutions, it is beneficial to take indigenous experiences as a reference; in that sense the country's legislation and norms protect collective rights, giving space for the use and exploitation of ways of life according to the communities' ancestral practices.

Although indigenous practices of taking advantage of nature based on culture and spirituality are well regarded by communities and residents and do not cause irreversible damage to nature, currently climate change (such as hurricanes) and its link to the national and international markets (mainly fishing) threaten the sustainability of resources, as well as the present and future of the lives of Indigenous peoples.

RECOMMENDATIONS

At the Regional Level

Recognize that community government structures are sustained and the challenge is achieving self-determination, thus it is necessary to pay respect to these good characteristics and preserve the local ecosystems and traditions, as in the case of Karata, which still maintains and exercises the values of self-determination.

Develop periodic coordination and planning mechanisms with the agencies that work in their territories to maintain good work coordination and transparency of appeals and to generate trust between communities and territories and agencies.

To reduce pressures and threats, promote sustainable production and marketing projects as an alternative to environmentally harmful enterprises, as well as environmental education campaigns and formulation and implementation of the Municipal Development Plan to ensure conservation of the protected area.

At the local level

To complement the indigenous community structures, continue strengthening visions regarding the ecosystem, the biocultural link and the complex system of relationships that constitute the community and its constituents' ways of life.

Recognize, respect and protect the traditional knowledge and regulatory practices regarding the exploitation of natural resources. The ecosystems and ways of life cannot be threatened by market demands; if market demands overlap there is a risk of breaking the balance that the community maintains with the biological corridor system and its traditional systems.

Recommend actions to the Karata Indigenous Territorial Government and the Indigenous Communal Government so that part of the sustainability of the resources and reinvestment in the territory (in terms of finances or money that comes from the State) can be used in a transparent way to support practices which care for nature, supporting the most vulnerable people in communities to sustain such sociocultural and natural practices, such as widowed women, the elderly (men and women), adolescent population, and single mothers.

Rescue of culture as an extremely important factor for conserving natural resources and the cultural traditions of ancestors for the conservation of biodiversity in their natural ecosystem.

Promote, in coordination with Ministry of Cooperative and Associative Community Family Economy (MEFCCA), Nicaraguan Institute of Agricultural Technology (INTA), the cultivation of citrus and other plants such as lemon, orange, ginger, soursop, avocado, among others that are used for consumption but also serve as medicinal plants, given that they run the risk of extinction after the passage of Hurricanes Eta and Iota.

Protect natural resources against sedimentation and pollution that can cause serious disruptions in the medium term if preventive and corrective measures are not taken to protect the hydric basins. Plan proper management for the use of forests in places that may impact water sources.

[The researchers for this study were MSc. Juan Rosman Hernández and MSc. Jadder Mendoza Lewis]

Endnotes

- 1 In the context of international law, autonomy is conceived as a way of exercising the right to self-determination, as stated in the UN Declaration on the Rights of Indigenous Peoples in the Resolution approved by the General Assembly 61/295 adopting the United Nations Declaration on the Rights of Indigenous Peoples. A / RES / 61/295 establishes in Article 3 that Indigenous peoples have the right to self-determination. By virtue of this right, they freely determine their political status and freely pursue their economic, social and cultural development; Article 4 recognizes that Indigenous peoples, in exercise of their right to self-determination, have the right to autonomy or self-government in matters related to their internal and local affairs, as well as to have the means to finance their autonomous functions.
- 2 In addition to Indigenous peoples, Law 445 considers an Ethnic Community to be the set of families of Afro-Caribbean descent who share an ethnic conscience because of their shared culture, values, and traditions linked to their cultural roots and land-holding and resource use practices.
- 3 In 2008, the Nicaraguan National Assembly issued a Declaration assuming the commitment to promote actions that take up the legal premises of the UN Declaration on the Rights of Indigenous Peoples, adopted by the General Assembly (of the UN) in 2007, to adapt national regulatory frameworks. It also urges the Executive Power to promote the pertinent actions, so that the commitments acquired by the country with the adoption of the Declaration become effective and are part of the public policy of the State for the benefit of the Indigenous peoples of the country.
- 4 They were approved by the National Assembly of the Republic in 1986 and 1987 respectively.
- 5 Regulation of Law 28. <https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/92444/107676/F-622526820/NIC92444.pdf>.
- 6 In the case of the Autonomous Regions, it has been understood that under the term indigenous peoples are the Miskitus, Sumu-Mayangna and Rama and, under the concept of ethnic communities are the Afro-Caribbean (Kreoles and Garifunas) and mestizo communities. In the case of Law 445, it only refers to Afro-Caribbean communities, when mentioning ethnic communities. Law 445 is the Law of the Communal Property Regime of the Indigenous peoples and ethnic communities of the Autonomous Regions of the Atlantic Coast of Nicaragua and the Coco, Bocay, Indio and Maíz Rivers, approved in December 2002 by the National Assembly.
- 7 www.marena.gob.ni. Estrategia Nacional de Biodiversidad y su Plan de Acción Nicaragua 2015-2020
- 8 Gobierno Territorial Karata, Diagnostico Territorial y Comunal Karata, Agosto 2010, p13.
- 9 Karata Territorial Government, Karata Territorial and Communal Diagnosis, August 2010, p15.
- 10 Thompson, Ofelia. Memory Workshop on the State of Governance in Indigenous and Afro-descendant Territories of the Northern Caribbean Coast Autonomous Region (RACCN), FADCANIC, April, 2019.
- 11 Budier, Teresa. Memory Workshop on the State of Governance of Indigenous and Afro-descendant Territories, Ibid.
- 12 Socioeconomic, Environmental and Nutritional Diagnosis for the Innovative Development Plan (PDI) of the Karata Indigenous Territory, Puerto Cabezas, RACCN_2017.

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Synthesis: Community-led Nature-based Solutions to Biodiversity Conservation and Forest Protection in Nepal and Indonesia

Indigenous communities around the world reiterated in the 2019 Climate Summit that indigenous knowledge systems are nature-based and respectful of all forms of life. Indigenous peoples represent 6.2% of the world's population and safeguard 80% of the world's remaining biodiversity and, at least, a quarter of the global land areas (ILO, 2019; IUCN, 2019; IPBES 2019, IPMG & WB, 2020). Indigenous peoples are already stewarding about one-fifth of the total carbon sequestered by tropical and subtropical forests (218 gigatons) and indigenous territories encompass 40% of protected areas globally.¹

Indigenous peoples' cultural values and belief systems have contributed to Nature-based Solutions (NBS) to address the impacts of climate change and environment degradation. However, their role and contributions in climate change adaptation and mitigation, biodiversity conservation, management of ecosystems and sustainable environment and development are hardly reflected in the discourse on climate change and ignored by relevant policies and programs at national and local levels. Despite basic principles of NBS already embedded in indigenous knowledge systems and cultural practices for ages, the definition of NBS to climate change is yet to espouse the fact. Nature-based Solutions is becoming a more controversial action while offering offset emissions or actions that allow to continue destroying nature (FPP, 2020).

In Asia alone, there are two-thirds of approximately 370 million Indigenous peoples enriching the region's enormous cultural and linguistic diversity. The region shares mega-biodiversity hotspots from which unique collective historical connections are built. The region is home to Indigenous peoples who depend on their natural resources, including waters, rivers, oceans, peatlands, forests, deserts, prairies and savannas. Apart from day-to-day interaction and management of their resources, Indigenous peoples in Asia are developing effective solutions and practices for biodiversity conservation and climate change adaptation and mitigation.² The region hosts around 20% of all plant and animal species and four of the world's biodiversity hotspots. It is also home to the biggest blue carbon stock in the world, with the largest areas of mangrove swamps and seagrass meadows found in Indonesia and the Philippines. This, along with the 500 million hectares of tropical forests, presents a significant potential for absorbing excess carbon dioxide from the environment.³

Being home to diverse Indigenous peoples and rich biodiversity, Asia holds a strong potential for abating further environmental damage, climate change, displacement of people and even health crises. The impact of COVID-19 aggravated the situation of communities due to already depleted natural resources. The pandemic challenged institutions, systems, policies and social relations. While claims linking climate change to the spread of COVID-19 are yet to be proven, many of the root causes of climate change also increase the risks of pandemics.

In the Global Biodiversity Outlook 2020 report produced by the Convention on Biological Diversity, habitat loss and degradation are major sources of global pressure on biodiversity. Due to rapidly shrinking forests and reduced access to resources, Indigenous peoples and local communities (IPLCs) have suffered severely as many of them source their daily sustenance from their forests and territories. Under the Sustainable Development Goals 14 and 15 on biodiversity and ecosystems, their decline would undermine up to 80% of SDG targets on key issues such as poverty, public health, and climate change. This has already been exemplified by several global crises being experienced today.

Despite these challenges, the contributions of Indigenous peoples and local communities to responsible management and conservation of forests are seen as more effective in reducing deforestation than in conventional protected areas. Sustained activism is also necessary to strengthen promotion and advocacies on the strong relationship of Indigenous peoples and local communities to their lands and territories.

All sectors, including Indigenous peoples, are developing solutions to address the climate emergency and enhance the resiliency of biodiversity, ecosystems and communities. For many Indigenous peoples, their relationship to their lands through their traditional laws, customs and practices is a major determinant of their identity and survival. Thus, any damage to nature would mean damage to Indigenous peoples. To prevent further damage, there is a need to recognize and secure indigenous land rights and urge governments to consult with Indigenous peoples in the management of their land and resources.

The experiences from Nepal and Indonesia show that the Indigenous peoples' respect for nature and interaction with nature maintain ecological processes leading to effective ecological services. The protected and managed ecosystems of the indigenous communities have been critical in meeting local sustenance such as food, water, furniture, fuel, wood, and medicine. The rich forests thriving in their territories provide them environmental services, such as clean air and protection from floods, erosion and related hazards, and help in mitigating climate change. Importantly, the natural environment where they practice their socio-cultural values of performance of rituals, observance of customary laws, respect for community leaders, and role of indigenous women and youth, also reinforces the identity of Indigenous peoples, thus ensuring unity in the community.

INDIGENOUS LEADERSHIP AND CUSTOMARY INSTITUTIONS ARE NATURE-BASED SOLUTIONS TO FOREST AND BIODIVERSITY CONSERVATION AMONG NGISYANWAS AND TSUM NUBRI IN NEPAL

The Ngisyang valley in Nepal's Manang District is home to the Ngisyanwa who have been living in the mountain ranges of upper Manang. The Ngisyanwa have their own customary institution called Mithewa, which effectively governs the conservation and management of their forests and agricultural and pasture lands. The Mithewa is composed of Dhawa Shyarpa (head or leader of the village), four Dhawas (Kh-hamwas), four Shyarpas (Lhen-nji) and one Katuwal (Choun or messenger). These respected community leaders are committed to observe and implement the community's way of life that is deeply connected to their land, forests and wildlife.

The Dhawa Shyarpa carries out social, cultural, political, legal, and even development work. They play a prominent role in carrying forward the customs, customary laws and village practices, and maintain law, order, peace and harmony in their community. Moreover, they amend, modify and reform the customary laws and practices and implement them as suitable to contemporary society. They settle disputes and quarrels between villagers and play vital roles in the continuation of religious and cultural activities including conservation and stewardship of their forests, prohibiting illegal hunting, and managing pasture and farm lands. They observe the seasonal cycle of managing the community's livestock and set a specific schedule to move their cattle to pasture lands during winter or summer. Activities like firewood collection from the forests are regulated. Punishment awaits those who violate the customary laws. For the Ngisyanwa, the general rule is to observe the customary laws and principles relevant to their daily life rather than commit violations.

The Tsum Nubri community in the Gorkha District of Nepal have a similar system called Shagya, which subscribes to the non-violence principle of Buddhist philosophy. The Shagya has a 7-point declaration, namely, 1) no hunting and killing animals (both domestic and wild), 2) no trapping of any wild animals, 3) no honey hunting, 4) no forest fire, 5) no trading (selling) of domestic animals for slaughtering, and 6) no entry for the meat trade. The Shagya bears rules and regulations that govern conservation, protection and management of the Tsum Nubri's resources, especially protecting wildlife, most of which are considered endangered. Poaching and trading of endangered animals are serious problems in Nepal and these issues intensely matter to the Shagya team, which has been working on an anti-poaching campaign. Endangered wildlife being protected today by the Shagya include the snow leopard, Himalayan brown bear and musk deer.

The forest ecosystems of the Tsum Nubri Indigenous peoples are also protected and conserved because of the observance of the Shagya system. The high incidence of forest fires is mitigated, resulting in thriving biodiversity in the area including medicinal plants and wildlife.

Both communities are conserving biodiversity by protecting their forests and wildlife. They depend largely on their customary institutions and have a high respect for their community leaders whose wisdom, nurtured and developed over time through their strong connection with nature, is very significant. Considered as indigenous knowledge, their forest management practices are

informed by their generations of relationship with nature that have been transmitted to the present generation. Their system of community forestry activities protects the natural environment, resulting in the re-establishment of natural habitats for the survival of wildlife as well as a substantial increase in forest cover and carbon sequestration. Their customary institutions and laws help them manage their forests by observing prohibitions against over-hunting, regulation of the use and access of their forest resources (i.e. ban on natural honey bee extraction), and the conscious application of no-harm principles and strategies (i.e. non-violence principle) to secure a balance between nature and people.

Communities still face the challenge of the lack of legal recognition of their land rights as this may restrict their ability to protect their forests and biodiversity. This is a core concern of the Indigenous peoples in Nepal including communities whose life and livelihood depend on their access and use of the land and natural resources. The lack of appreciation and understanding of indigenous and local knowledge by the government poses a threat that these indigenous local knowledge (ILKs), if not mainstreamed, will not flourish. Issues of misunderstanding the cultural context and identity of Indigenous peoples are still evident as livelihood practices such as cash and non-cash incomes are tagged as illegal, and thus are “criminalized.”

INDIGENOUS AND LOCAL KNOWLEDGE AMONG THE DAYAK COMMUNITIES ARE NATURE-BASED SOLUTIONS IN MANAGING AND PROTECTING THEIR FOREST ECOSYSTEMS IN SANGGAU AND KETAPANG DISTRICTS OF WEST KALIMANTAN

The Dayak people from the Tiong Kandang and Tampun Juah and the Jalai and Kendawangan communities located in Sanggau and Ketapang Districts, respectively, of West Kalimantan demonstrate that indigenous and local knowledge are models for sustainable use and management of their lands and natural resources including forest ecosystems. Their ILKs are considered as nature-based solutions, which have been developed over a long time to provide guidance to live in harmony with nature and maintain a balanced relationship between people and nature. These are also relevant in addressing the environmental crisis brought about by climate change. The emergence of COVID 19 raised a new awareness of how local wisdom or ILKs can be utilized in resolving the current issues on climate change and the health crisis.

The knowledge of the Dayak indigenous communities has developed as they use everything available in their environment. This knowledge originated from the values and beliefs transmitted from their ancestors such as the observance and practice of the principles of natural resource management and self-determined development that are now known as the Seven Fortunes of the Dayak. These principles are diversity and sustainability, cooperation and togetherness, organic and naturalness, rituals and spirituality, process and effectiveness, domestic and subsistence, and customary law and locality. All these principles have been manifested by the communities in their interaction with nature and their management of natural resources, such as their forest ecosystem.

The Dayak communities located in various kampongs (hamlets/villages) observe sustainable farming and agricultural activities meeting economic, social, cultural and spiritual needs. Their rice cultivation involves the conduct of rituals and growing of two or more crops together. The spirit of cooperation is shown through respect for nature as habitat for other creatures. Learning the capacity of nature to sustain itself promotes mutual benefits and co-existence. However, the exploitation of nature will result in externalities such as pollution and health issues. The performance of various rituals by the Dayak people reinforces spirituality and this is important in forest management as they revere forests as “places of worship.” The traditional ritual of *Tolak Bala* to get rid of bad luck and expel evil influences, diseases, pestilence and viruses from their villages is an example of a living tradition that appeases nature to help stop a pandemic or great suffering in the community.

Sustainable farming activities like the practice of rotational farming contributes to food security of indigenous communities. These daily activities are often accompanied with rituals like the *ga-wai padi* - rice harvest rituals for rice farming.

Good results are achieved with good intentions and actions in forest management among the Dayak people. This means forest management is carried out with consistent adherence to balanced economic and ecological goals. Reliance on subsistence economy is a way to serve one’s needs without exploiting nature. Customary laws and local laws safeguard the harmonious relationship between nature and humans. Such practice of customary laws regulates the excessive and abusive use of resources.

The Tiong Kandang community in Sanggau District with legal recognition from the Sanggau District government in 2018 utilizes their forest as a vast center for cultural identity and livelihood. They gather numerous products from the forest like fruits, rattan, bamboo, honey, and sugar. They hunt for food, gather bark to make clothing and other materials to make mats, baskets and to build their houses. The forest also serves as a natural pharmacy that provides medicinal plants.

The Tampun Juah community of Sisang Ketemenggungan at Kampong Segumon in Lubuk Sabuk Village of Sekayam Sub-district in Sanggau District highlight three aspects of customary territory. For them, the history of their territory, sustainable management of their forests, and use of customary laws have helped to keep their customary territory intact and sustainable. The presence of customary laws and wisdom is a great indication of community identity and governance. The customary lands are basically governed by strict observance of respect for customary leaders or authorities who are the key implementers of customary laws and agreements. The classification or delineation of their land use serves as a guide in the system of ownership and control of resources in the community. Land classified as primary forest is protected, and an area classified as farm area is utilized to produce organic crops. Local farming such as vegetable cultivation is a major source of livelihood, and they maintain a local-based knowledge on farming.

Indigenous women play a very important role in overseeing the health and wellness of their family. They also perform rituals in the community like the customary ritual, *Tolak Bala*. Aside from being known as traditional healers, indigenous women in the community are the educators in the family. They are also knowledge holders of culture and tradition and gentle “teachers” to their children. The family’s economic need (e.g. educational support for their children) led women to seek employment as laborers in companies, which further put them in a vulnerable

situation during the COVID-19 pandemic as the companies would force them to work without compensation. This situation shows the discrimination and indifference of companies to these women. For indigenous women who do not work in a company, they continue to work in their fields or *dahas* (managed forest).

The Dayak Kendawangan communities in Jelai Hulu and Marau Sub-districts in Ketapang District share similar management strategies; they give emphasis to cultural values as the great influencer in relating to nature. They have already mapped and set the boundaries of their territories and indicated where their homes are and what their forest looks like.

The Iban Sebaruk community, which has secured land titles from the government, is still awaiting verification of their customary forest application, which is facing conflict with the government due to overlapping claims, including over their customary lands. The community's solidarity is also under threat because of opposing views on the operation of plantation companies.

Despite the presence of these local and indigenous knowledge that greatly contributed in preserving Indonesia's rainforests, the country is continually facing environmental degradation and threats from extractive industries and oil palm plantation businesses. Its high rate of deforestation for the period 2000-2005 made Indonesia the fastest forest destroyer and the world's number one emitter of greenhouse gases from deforestation in 2008. Up to the present, forest loss in the country continues, with West Kalimantan among the regions with high forest loss since 2015-2017 due to overlapping plantation and mining concessions throughout the districts of Landak, Ketapang, Bangkayang Sentang, Melawi, Kapuas Hulu, Sambas, Sanggau and Kubu Raya.

The indigenous communities are still threatened with the government's non-recognition of their indigenous livelihood such as the practice of shifting cultivation, causing the community to rally for recognition of their livelihood practices.

At present, the Dayak communities are pressured in addressing increased deforestation, land grabbing and discrimination, instability of livelihoods, insufficient government support and services that include culturally sensitive and appropriate healthcare and education. The COVID-19 pandemic, including the measures imposed to curb its spread, are aggravating their situation. On socio-economic concerns, Indigenous peoples continue to face discrimination in their workplaces, such as being assigned heavy workloads without consideration of health hazards or being laid off without due process.

The changing platform in formal education due to COVID-19 prompts the use of technology and the internet, which the Dayak indigenous communities consider as added burden in terms of connectivity.

CHALLENGES AND OPPORTUNITIES

There are threats and opportunities in looking at nature as an asset in addressing climate change and in the pursuit of development goals. The threats of climate change and COVID-19 such as food insecurity, displacement as a result of catastrophic flooding, drought, and fires, violation of rights, discrimination and poverty are expected to be considered in the development of nature-based solutions, policies and actions. Transformative change should seek to address pre-existing issues and advocacies of Indigenous peoples such as recognition and promotion of their rights including territorial right, incorporation of indigenous knowledge in resource management, and participation in planning and implementation in any development agenda.

With the emergence of COVID-19, the situation has become more challenging for Indigenous peoples who are at the frontline of protecting their forests and natural ecosystems. The stories of indigenous communities continue as they defend and secure land tenure over their customary forests and resources while faced with external threats of industrial interests and impacts of climate change and COVID-19.

The 2030 Sustainable Development Agenda and the ongoing discussions on nature-based solutions provide an opportunity to reiterate a transformative agenda for development through the use of whole of society approach. It is urgent that the capacities, practices and governance systems of Indigenous peoples are respected and integrated in the pursuit of nature-based solutions and achievement of every SDG. The experiences reflected in this study show that Indigenous peoples are contributing significantly to maintain and restore nature and that they are partners for addressing biodiversity loss and the climate crisis. Indigenous peoples' contributions to a healthy planet are rooted in their cultures and strong collective relationship with their lands and territories. This means that Indigenous peoples' identities, governance systems and spirituality are realized when they co-exist with nature.

CONCLUSION AND RECOMMENDATIONS

The search for nature-based solutions should entail the recognition of rights to Indigenous peoples' lands and knowledge associated with land and resources. It should also take into account indicators that will include their secure land tenure and continuous practice of indigenous knowledge such as appreciation and promotion of customary institutions/laws or principles of collective well-being and the practice of self-determined development.

In meeting the climate and development goals, the outcome of any NBS should deliver effective, resilient, legitimate and equitable outcomes to all. Indigenous peoples must take part in every aspect of designing, implementation, management, monitoring and evaluation of NBS. Crucial to creating profound NBS plans for addressing climate and development goals is having the framework of fostering ownership, empowerment and well-being of Indigenous peoples and local communities.

Solutions such as NBS to combat climate change and biodiversity degradation require clear and consistent adherence to self-determined development of Indigenous peoples and human rights principles. Equally important is the observation of the free and prior informed consent of Indigenous peoples alongside their full and effective participation. Safeguards that will promote protection of their rights and use of indigenous and local knowledge should be developed.

The economic importance of nature or “assets” to generate future benefits in the name of the ‘green economy’ should be thoroughly discussed, along with how the private sector and government are investing in such programs. There have been recorded unintended impacts of some projects and solutions on Indigenous peoples in Nepal and Indonesia and other countries in Asia where collective rights over their lands, territories and natural resources are not recognized.

For Indigenous peoples, nature has more than financial and economical values. They see nature as connected to their culture and spiritual values. Therefore, recognizing the legal rights of Indigenous peoples and local communities over their lands and territories is crucial to the success of implementing NBS solutions in combating climate change. Leveraging on the leadership, collective wisdom and indigenous knowledge of indigenous communities will further result in meaningful impacts of NBS. This can help address the issue of persistent poverty, climate change and discrimination of marginalized communities.

Specifically, the following recommendations should be considered:

- Governments should institute mechanisms and policies that will account and respect diverse indigenous and local norms, values, livelihood and resource management practices and food security systems.
- Governments should include respect for culture and land rights as indicators in developing and implementing nature-based solutions.
- Coordinated actions among government, the private sector and Indigenous peoples should be ensured prior to any NBS intervention. Full and effective participation of Indigenous Peoples in the planning, implementation and monitoring processes should also be considered.
- Strengthen capacities of Indigenous peoples to achieve the agenda of any development intervention and address impacts of climate change including implementation of any nature-based solutions. Capacities should be built through awareness and sensitization programs on the importance of indigenous and local knowledge in nature conservation and climate actions among relevant stakeholders including local representatives, government officials and Indigenous peoples.
- Government should facilitate accessibility issues being faced by indigenous leaders and communities on the use of technology and infrastructure to support and enable the effective and efficient implementation of nature-based solutions in addressing climate change and development agenda.

Endnotes

- 1 <https://www.sciencemag.org/news/2015/12/indigenous-people-could-be-key-storing-carbon-tropical-forests-new-report-concludes>.
- 2 <https://www.tebtebba.org/index.php/news-and-updates/nature-based-solutions-NbS-for-climate-change-a-vision-from-indigenous-peoples>.
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Nepal: The Ngisyanwas and Tsum Nubri in Manang and Gorkha Districts

By Pasang Dolma Sherpa, CIPRED

INTRODUCTION

Indigenous Peoples represent 6.2% of the world's population and safeguard 80% of its remaining biodiversity and at least a quarter of its land area (ILO, 2019; IUCN, 2019; IPBES 2019, IPMG & WB, 2020). Their cultural values and belief systems have contributed to nature-based solutions (NBS) to address the impacts of climate change and environment degradation. However, the role and contributions of Indigenous peoples (IP) in climate change adaptation and mitigation, biodiversity conservation, management of ecosystems and sustainable environment and development are hardly reflected in the discourse on climate change and addressed by relevant policies and programs at national and local levels. Despite basic principles of NBS already embedded in indigenous knowledge systems and cultural practices for ages, the definition of NBS in relation to climate change is yet to espouse this fact. Nature-based solutions is becoming a more controversial action while offering offset emissions or actions that allow to continue destroying nature (FPP, 2020).

NBS is emerging as a prominent discourse at United Nations Framework Convention on Climate Change (UNFCCC) and Convention on Biodiversity (CBD) conferences. It is also becoming a focus of the International Union for the Conservation of Nature (IUCN)'s works for protecting nature, biodiversity and addressing climate change impacts. This has been intensified by the current draft of the CBD Post-2020 Global Biodiversity Framework (GBF) with the goal of safeguarding at least 30% of the planet through protected areas and other effective measures. However, NBS does not guarantee the rights of Indigenous peoples, local communities and Afro descendants (RRI, 2020) for the continuation of their traditional livelihoods, cultural practices and governance systems. There is a possible threat of undermining the crucial role and contributions of Indigenous peoples in the discourse of NBS and support for the promotion of their rights.

The IUCN Global Standard for Nature-based Solutions along with its eight criteria and indicators specify multiple benefits from addressing several challenges. The criteria 5 and 8 indicators underscore the importance of the Free Prior Informed Consent (FPIC) process and the respect for human rights guaranteed by different international legal instruments, including the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). However, the indicators do not push for the recognition of the rights of IPs in the architecture of NBS.

Nearly two billion IPs and local communities (LCs) claim around 50% of the earth's terrestrial areas, primarily held collectively or for common use, and of it, barely 10% is recognized legally (RRI, 2020). Much of the NBS will require these lands/resources to be owned or used by IPs and LCs, which legally belong to governments. Any NBS which does not take into account the IPs' and LCs' rights and claims will lead to further land grabbing, dispossession and conflicts at community, national and global levels.

Indigenous peoples in Nepal have been living in the natural environment for generations. They have developed indigenous knowledge systems, cultural values and traditional practices, along with a strong customary and spiritual core, that prove useful in their self-governance systems of the natural resources. For Nepalese IPs, a sustainable governance system of natural resources translates to sustainable livelihoods, food security, maintained biodiversity and ecosystem, and climate change resilience.

The Nepal government listed 59 Indigenous peoples' groups that comprise 35.6% of the national population (CBS, 2011). Indigenous peoples are already finding it hard to continue their traditional livelihoods and cultural practices due to government policies that declare areas as national parks and conservation areas. The relevant laws and policies in Nepal have failed to see the interconnection between Indigenous peoples and nature, and therefore their rights to traditional livelihoods and governance systems continue to be violated, despite the fact that Nepal has voted for UNDRIP and International Labor Organization (ILO) Convention 169. In the present discourse of NBS both at the national and global levels, there has been a threat of the continuation of the business-as-usual model of nature conservation.

The Ministry of Forests and Environment in Nepal has been integrating and mainstreaming NBS through different policies and programs, such as the National Climate Change Policy 2019, the National Environmental Policy 2019, the National Forest Policy 2019, the National Biodiversity Strategy and Action Plan (2014-2020), the National Ramsar Strategy and Action Plan (2018-2024), and the Forest Sector Strategy (2016-2025). These are all in line with the outcome of the decision of UNFCCC and CBD. However, the emphasis of these policies is on protecting forests and biodiversity alone, without recognizing the symbiotic relationship between Indigenous peoples and nature. Thus, the voice and concerns of IPs for their right to continue their traditional livelihoods in their ancestral domains remain unheard to the state. Therefore, in the discourses on NBS within UNFCCC and CBD dealing with the issues of climate change and protection of biodiversity, it is crucial that state parties and concerned agencies listen to Indigenous peoples' stories and experiences -- how their livelihoods and cultural practices are themselves a demonstration of nature-based solutions and how these contributed to sustaining the environment, ecosystems, biodiversity and climate resilience for generations.

This case study aims to bring to the fore the evidence-based nature-based solutions being practiced by Indigenous peoples in Nepal and their contribution to the global discourse on NBS that respect the human rights of Indigenous peoples to continue their livelihoods, indigenous knowledge systems and cultural practices. The study utilized literature regarding nature-based solutions, virtual key informant interviews and focus group discussions as well as telephone conversations and discussion with the Indigenous peoples. It involved two indigenous communities - the Tsum Nubri and Ngisyang communities of Gorkha and Manang districts, respectively.

INDIGENOUS PEOPLES' LEGAL STATUS IN RELATION TO THEIR LAND AND RESOURCES

This section covers the provisions of laws and policies in relation to Indigenous peoples and how the NBS approach presents their issues and concerns.

The total population of Indigenous peoples in Nepal is 9,267,870, which make up 35.6% of its total population (Dahal, 2014). The Nepal Federation of Indigenous Nationalities (NEFIN) claims that 40% of the population still remains unaccounted for as the 2011 census left out 11 indigenous groups. The High-Level Task Force Recommendation Committee for the revision of the list of indigenous nationalities in Nepal formed by the government in 2009 has recommended the recognition of 81 different Indigenous peoples' groups. The government has legally recognized 59 IPs' groups (NEFDIN Act, 2002) and one more indigenous group (Rana Tharu) has recently been listed, but still many others who were recommended are not recognized.

The government of Nepal has signed/ratified different international human rights instruments such as ILO Convention 169, UNDRIP, CBD and UNFCCC. Article 26 (1, 2 & 3) of UNDRIP presents that Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired. It further states that the state shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the IPs concerned. Moreover, Article 31 (1 & 2) declares that IPs have the right to maintain, control, protect and promote their cultural heritage, traditional knowledge and cultural expressions. Similarly, ILO Convention 169, Article 5 (a) also provides for the recognition and protection of their social, cultural, religious and spiritual values and practices.

Article 8 (j) of the CBD also emphasizes the importance of respecting, preserving and maintaining traditional knowledge and cultural practices of Indigenous peoples and local communities for conservation and biodiversity. Similarly, the Cancun Safeguards and the Paris Agreement under UNFCCC support the rights-based approach and respect for human rights and rights of Indigenous peoples and local communities while taking action to address climate change. Despite the Nepal government endorsing/ratifying these international human rights instruments, it is yet to fully develop or harmonize its national policies with these commitments.

The Constitution of Nepal (2015) calls for special acts related to forest and biodiversity at the local level. According to Article 56, the basic governance structure of Nepal consists of three levels -- federal, provincial and local—and these three levels can exercise state powers in accordance with the Constitution and prevailing laws. It states that the use of state powers should be in such a way that the federal, provincial and local governments protect the egalitarian society and uphold inclusive representation and equality. The local level must respect and protect inclusive representation and identity of Indigenous peoples and local communities. However, the Federal, Provincial and Local Level (Inter-Relations Management) Act, 2077 (2020) presents that the local level should follow the procedures mentioned in the law-making process of the Village Assembly and Municipal Assembly formulated by the concerned provincial government in accordance with Article 226(2) of the Constitution. Therefore, the Local Government Operation Act, 2074

(2017), Article 11 provides the rights to rural municipalities and municipalities¹ to formulate local laws, policies, standards and plans related to environmental protection, forest and biodiversity. Although there has been provision for developing local laws to ensure the rights of Indigenous peoples and local communities to protection and legal recognition of their customary institutions, knowledge systems, skills and self-governance system, this has been underutilized because of the low awareness and capacity on legal provisions among the local elected bodies and indigenous leaders.

Government policies and programs related to climate change, environmental laws and policies

The Ministry of Forests and Environment (MoFE) has been integrating and mainstreaming NBS into different policies and programs related to climate change and environment, such as the National Climate Change Policy 2019, Environment Protection Act 2019, National Environmental Policy 2019, National Biodiversity Strategy and Action Plan (2014-2020), National Ramsar Strategy and Action Plan (2018-2024), Forest Act (2019), National Forest Policy 2019 and Forest Sector Strategy (2016-2025), among others. However, there is an absence of legal provisions to ensure the rights of Indigenous peoples, especially recognition of indigenous traditional knowledge and cultural practices and the urgency to protect, promote and recognize sustainable management of the forest, biodiversity and climate change resilience.

The Climate Change Policy of 2019 aims to mitigate the impacts of climate change by adopting more environment-friendly approaches to economic development in building a climate-resilient society. The policy has included actions for the protection of the environment, sustainable management of natural resources leading to their restoration, and environment-friendly approaches to address societal challenges and bring about economic growth. Although it does not include the protection and assurance of IPs' rights to continue traditional livelihoods directly as basis for dealing with climate change impacts, an integral part of NBS emphasizes the integration between traditional knowledge, skills and practices and innovative technologies to promote climate-friendly agricultural systems, and to document and promote other adaptive measures (MoFE, 2019). The policy has further prioritized and emphasized addressing the concerns of women and incapacitated and disadvantaged persons or groups in matters related to climate change. As a document, the policy seems to be very ambitious compared to its real implementation.

The Environment Protection Act, 2019 aims for protection of the fundamental right of each citizen to live in a clean and healthy environment by limiting the negative impacts on the environment with its environment management plan which requires development projects to cause no harm to nature. Although the Act does not mention anything on the rights of IPs and the importance of continuing indigenous traditional livelihoods and knowledge systems for protection of the environment, it mentions the importance of the local traditional practices on protection, conservation and sustainable use of the environment and equitable distribution of benefits received from the use of environmental resources.

Likewise, while making adaptation plans to avoid adverse impacts and risks of climate change, the Act states that it would accord special priority to women, persons with disabilities, children, senior citizens and economically indigent communities who are more vulnerable to effects of climate change (Section 24). No explicit mention is made of Indigenous peoples when the government refers to its priority groups in its adaptation planning. However, the Act provides for developing a Local Environment Act in line with the corresponding Federal and Provincial Environment Acts. Indigenous peoples may have some space for ensuring their rights in the local level laws.

The local level² also has an important role to play in the environmental conservation areas to be declared based on Chapter 5 of this Act. Based on Section 30, such areas may be ‘any place containing a natural heritage or aesthetic place which is considered extremely significant from the point of view of environmental protection or any place of historical or cultural importance.’ The Section further states that in the management of such areas, participation of the local community may be forged. However, it defines the local community as ‘the community residing within or in neighborhood of such an area.’ Thus, the Act has clearly failed to identify Indigenous peoples as a distinct category, separate from the mainstream community.

At the national level, an environmental protection and climate change management national council chaired by the Prime Minister carries out acts relating to environmental protection and climate change. The council mainly comprises government officials and some thematic experts, and the Indigenous peoples’ consideration is again lacking in this composition.

Chapter 6 of the Act provides for the compensation to be provided for environmental damage. Section 38 has given an important role to the local level for the formulation and implementation of the Environmental Protection Plan considering the forest area as well.

There are certain reserved seats for Indigenous peoples as local representatives to the local government. But those positions alone are minimal and nominal for decision making. For the implementation of these provisions, additional provisions including those ensuring the effective participation of Indigenous peoples in the planning and implementation processes through the recognition of their knowledge systems and cultural values need to be ensured in the local forest and biodiversity laws in line with the provisions of the new Local Government Operational Act 2017.

Nepal Environment Policy, 2019 serves as a guidance to minimize the adverse impacts of developmental activities and to maintain a balance between environment and developmental activities through environmental impact studies.

Section 8.2 of the policy clearly emphasizes the management of development activities at all stages, minimizing their negative impacts both on nature and people. It states that development activities should focus on increasing positive impacts and requires an environmental impact study report. Likewise, Section 8.3 provides that communities who are impacted by development activities in forest areas will be compensated for their losses, giving priority to the poor, marginalized, landless, Indigenous peoples, vulnerable households, women and persons with disabilities. However, the policy does not mention that Indigenous peoples have a choice to decide whether to welcome or not development activities that negatively impact on the continuation of their traditional livelihoods and cultural values.

Section 8.4 highlights the importance of the promotion of energy-efficient technology and co-operation and coordination among the federal, provincial and local governments for the conservation of environment. Section 8.5 aims “to protect and sustainably conserve an environmentally sensitive area.” However, it does not mention the use of indigenous knowledge and technology that contributed to the conservation of these areas for generations. The policy is built on the same traditional conservationist approach, focusing more on nature with little regard for human well-being. Though it aims to protect the environment from all harmful impacts, it clearly lacks considerations about the rights of Indigenous peoples and traditional knowledge and cultural values as basis for sustainable management of the natural resources and biodiversity.

National Ramsar Strategy and Action Plan (2018-2024) acknowledges wetlands as an important factor in maintaining a healthy biodiversity and the socio-economic well-being of human beings. According to Section (2.5), the wetland ecosystem serves as a source of food and income for many indigenous communities. The ecosystem also holds a divine space in IPs’ spiritual and cultural values and traditional knowledge that ensures biodiversity restoration, conservation and sustainable use.

Understanding this correlation between ecosystem restoration and sustainable use, the strategy of Integrated Water Management System (coordination between agriculture and water resources) and ecosystem approaches like ‘wise use of wetlands and ecotourism’ have been mentioned in the integrated management of natural resources that promotes conservation and sustainable use in an equitable way. One section also describes a level of ensuring equity in Strategy (6), Key Action (6.1) on “documentation of indigenous knowledge, skills, innovation, and practices of wetlands conservation and management.”

Although the Strategy has provisions to recognize the promotion of traditional knowledge, skills and wetlands practices inclusive to wetland-dependent communities, the issues of Indigenous peoples for recognitions of their fundamental human rights have largely been ignored in the wetland management.

National Biodiversity Strategy and Action Plan (2014-2020) presents the mountain regions of Nepal as having a high biodiversity (80% of biodiversity of Nepal) and cultural diversity of many ethnic communities who are living in poverty and are highly dependent on natural resources for their survival and for the continuation of their traditional cultural and livelihood practices. Although 18 different Indigenous peoples live in Nepal’s mountain region and have contributed to the richness of the area’s intact biodiversity, ecosystems and conservation, the Plan does not focus and prioritize the protection of indigenous knowledge and cultural values.

As NBS aims to build a climate resilient community and restore the ecosystem, the National Biodiversity Strategy and Action Plan (NBSAP) has considered the following strategies: 1) conservation of mountain biodiversity (Section 5.4.6) by promoting environment-friendly economic development through ecosystem-based adaptation programs and ecotourism, 2) securing the rights of Indigenous peoples to free prior and informed consent in accessing gain over genetic resources associated with traditional authorities and 3) integrating traditional knowledge, innovations and practices in the management of biodiversity and ecosystem. However, its implementation has been the major problem for the enjoyment of these provisions in the Action Plan by Indigenous peoples in the mountain region.

The Forest Act 2019, which repealed the Forest Act 1993, is aimed at protecting the forest and its natural resources and bring national prosperity by its sustainable utilization. Its preamble states that the national forest should be managed by the government as government-managed forest, forest conservation area, community forest, collaborative forest, leasehold forest, and religious forest. It does not mention customarily managed forest by Indigenous peoples despite still being practiced by them. It is clear that this Act was issued for the purpose of managing the national forest and conserving and utilizing the forest, wildlife, environment, watershed and biodiversity.

Section 31 of the Act provides for the formation of user groups and Article 32 for their rights and roles. Section 2(b) defines a user group formed in accordance with Article 31 for the purpose of conservation, management and utilization of forests by the user group. Section 18(1), (2) and (3) provide for the handover of community forests to the user groups. According to Article 18(5), the user groups should consult with the local level in formulating and amending the community forest action work plan. They can partner with the local level while carrying out forest enterprise and eco-tourism activities with main emphasis on income generation rather than protection of indigenous knowledge and skills based on the forest resources [Section 34(1)].

This Act does not directly address the traditional customary forest management system that is being protected locally on the basis of traditional practices. However, Section 18(1), (2) and (3) provide for forest handover procedures for a community forest, and in the process it is necessary to recognize the traditional practices, if the local community has been managing the forest in a traditional way. This provision would support the recognition by the local forest act of indigenous customary laws and practices. Therefore, under these provisions of the Forest Act, 2019, the continuity of the traditional way of forest management system is possible.

In addition, the Forest Act, 2019 has provided adequate roles for the local level in the context of forests. Based on Sections 35 and 36, the local level plays an important part in mobilizing the forest produce of private forests and religious forests (Section 29) as well as in managing public and urban forests (Sections 37, 38). The local level is also represented in the inter-level coordination committee on forest (Section 73). According to Section 6 and 7, the local level has a role to play even if the record of private registration of national forest has to be cancelled within the boundaries of the national forest. Thus, since the Forest Act, 2019 has provided functions to the local level in relation to forests, clear provisions should be made in the local level forest and biodiversity laws to fulfil these roles effectively.

Section 23 of the Act sets an objective of supplying the traditional users living nearby or far from the forest area with forest resources in partnership forest management (a national forest³ managed in partnership between the Division Forest Office, local government and forest users).⁴ However, Section 5 states that the government has power over the land to demarcate the boundaries of any national forest by incorporating any public or private property that is within or adjoining the forest. This provision impacts Indigenous peoples residing near national parks as this may result in their being forcibly moved from their ancestral lands. As per Section 9, a Division Forest Officer appointed by the forest ministry can release a notice to prohibit entry in whole or any part of the forest if seen necessary for the protection of the forest. Indigenous peoples' lifeways are nature-based and such restrictions can bar them from accessing forest products that are vital for their livelihood and cultural practices.

Section 24 provides for the formation of partnership forest users groups by the traditional users to make necessary provisions for the protection, development and sustainable use of the forest resources. And such users' groups have a right to sell the forest products to outside groups and invest 25% of the gains to the partnership forest development and management of the forest and at least 25% of the remaining amount in poverty alleviation, women empowerment and economic development activities (Section 24). Moreover, Section 28 states that for the protection of any religious site and forest in its surrounding, religious forests will be handed over to a religious body, group or community established under the prevailing law. However, this does not mean that the rights in such forests are transferred to such a religious body, group or community. The government authority may take back such forests (Section 30).

Overall, the Act has the potential to contribute in the protection of the forest and its resources; however, it means little for Indigenous peoples in terms of their right to access resources near the national parks and other protected areas. This tends to limit the basic human rights of Indigenous peoples living near national parks and other protected areas.

National Forest Policy, 2018 mentions that so far the government has been successful in raising the standard of living of the poor community people with the *Kabuliyati Ban* program.⁵ However, it has not specified who the actual program beneficiaries are. Instead, it uses "poor people" as a blanket term for its beneficiaries, which means the beneficiary may or may not include Indigenous peoples, depending on the local population.

Section 8.4 of the policy acknowledges the customarily conserved area other than the national parks and other conservation areas declared as "Community Conserved Area." Section 8.3 ensures increasing the employment opportunities within the forest area through making all the traditional, spiritual, cultural and environmental areas tourism-friendly and promoting traditional medicines in the international markets while also creating a suitable environment for knowledge generation by studying and combining traditional medicines in the local community with modern scientific knowledge.

The Policy further ensures the documentation, registration and security of traditional knowledge, skills, practices, intellectual property associated with biodiversity in the indigenous and local community (Section 8.8). It ensures the inclusion and securing of the rights of Indigenous peoples, Dalit, Madhesi, Tharu and other marginalized communities in the management plans, including taking the free prior and informed consent of the communities who will be most impacted by any management or development activity (Section 8.8.1). While the forest policy is progressive in recognizing the role and contributions of Indigenous peoples, it is not in line with the National Park Act and regulations that prohibit their continuing traditional livelihoods.

The Policy very well addresses the actions for nature-based solutions as it focuses on forest protection by acknowledging the importance of indigenous knowledge in managing and planning forest areas and the need for FPIC of people before starting any intervention in their area, but the implementation of these provisions has been weak at the community level.

The Forest Sector Strategy, 2016-2025 also aims to implement NBS through the adoption of ecosystem-based adaptation to mitigate climate change impacts and acknowledges the importance of representatives from women, poor, and socially discriminated groups in the annual planning and budgeting processes at all levels. The strategy has also prioritized actions to recognize

community-based forest management for the sustainable management of the forest based on the

integrated land use approach, contributing to biodiversity conservation, eco-tourism, climate resilience and community development. Although it emphasizes promotion of gender equity, and socially and economically uplifting poor, women, Indigenous peoples and other marginalized groups within the community forest users' groups, the voice of Indigenous representatives is often not heard and recognition of IPs' traditional customary institutions and governance systems has not been part of the community forest management systems.

Although the strategy has come up with priority actions for a healthy and climate-resilient society, including the conservation of specific sites like spiritual forests, it still lacks clear mention of the integration of customarily managed forest with the traditional knowledge and cultural practices of Indigenous peoples as in the Forest Act.

INDIGENOUS PEOPLES' INITIATIVES AND ACTIONS

The Indigenous peoples have been playing crucial roles and contributing to the sustainable management of the natural resources, ecosystems and biodiversity. Different studies and experiences have already proved that the indigenous way of life is based on the principle of nature-based solutions that have been the basis for dealing with global crises, especially climate change resilience. However, different laws and policies focused on promotion of NBS including the climate change policy, forest act policy and strategy do not mention the protection and promotion of indigenous knowledge systems and cultural values.

This section presents two cases to show how the indigenous knowledge and cultural values of Indigenous peoples from Manang and Gorkha districts are based on nature-based solutions.

Ngisyang valley of Manang

The Ngisyang valley of upper Manang is popularly known as the district beyond the Himalaya. Its residents are called Ngisyanwas in the local dialect (Rosers, 2004). The Manang district, which occupies an area of 2,246 sq. km., is located at an average altitude of 3,600 meters above mean sea level. Also called Manang valley, the district borders Gorkha to the east, Mustang and Myagdi to the west, Tibet (China) to the north, and Kaski and Lamjung to the south. Manang is one of the largest districts of Nepal in geographic extent and smallest in population.

Rich in cultural, geographical, ecological, and social diversity, Manang is divided into three parts according to geographical variation and distinct ways of life: Upper Manang, Lower Manang, and Nar-Phu. It has four rural municipalities, namely, Chame, Nason, Narpa Bhumi and Manang Ngisyang, which replaced the then 13 village development committees (VDCs) after the government implemented a new local administrative structure on 12 March 2017. The Ngisyang valley

is in the Manang Ngisyang Rural Municipality, which is further divided into nine wards. The municipality has a total area of 694.63 square kilometers and a population of 2,222. On the local level, it is bordered by the eastern part of Narpa Bhumi Rural Municipality and the western parts of Myagdi and Mustang districts, northern parts of Narpa Bhumi Rural Municipality and Mustang districts, and the western parts of Kaski district.

The average annual temperature in Manang valley ranges between 10° C and 15° C, with the highest at 21° C in summer. Winters can be cold with temperatures falling below -5° C along with heavy snowfall (Chapagain, 2008).

The 2011 national census placed the population of Manang district at 5,827, comprising 3,015 males and 2,812 females, with the majority being Indigenous peoples. Unlike in other districts, Manang's population appears to experience remarkable oscillations from one census to the next. And a major factor for this is the frequent movement of the Manangi people towards Kathmandu, Pokhara, and other cities, mainly in search of jobs, better education for their children, and in pursuit of their business.

The Ngisyang valley since ancient times has been an abode for two indigenous communities, the Gurungs and Ghailes. Stemming from the Gurung and Ghale communities are clans, such as Tonde, Samwe, Ngarchong, Bhrakalama, Ghurchyakchyak, Kandedu, Kale, Ngimchhiring, Bagting, Kamisatar, Khen, Jimalthoki, Pantilama, and Prop (Gurung & Neupane, 1969). The people in the valley belong to the Mongoloid race, are Buddhists and speak the Ngisyangte language. Despite a law that restricts people from outer communities to purchase land, the valley in recent years has become home to Tamang, Rai, Magar, Kshetri, and Kami as well. Most of the new and non-Indigenous people are involved in taking care of locals' homes, running small-scale businesses and doing wage-based jobs.

Traditionally, Ngisyanwas have been involved in agriculture, animal husbandry, and trans-border trade. They grow potatoes, wheat, buckwheat and barley (*karu*) as chief crops while mustard, cabbage, cauliflower, broccoli, carrot, and beans represent the majority of their vegetable production. People rear animals like yak, nak (female yak), cow, horse, sheep and goat. They keep yaks as major beasts of burden and their main source of meat while sheep are grown for the dual purpose of meat and wool. The horse is the main means of transportation. Other animals are kept either for obtaining manure for farmlands or fulfilling the need for transport. Animal husbandry and animal sales, likewise, have been a reliable source of family income. As animal husbandry is the major source of earnings and subsistence in the valley, every village in the district has maintained its own pasture lands. At present, however, the occupation of animal husbandry is threatened by the lack of human resource as most of the people are shifting to trade.

All the villages in the Upper Manang have their own forests for the collection of firewood, timber, and medicinal herbs. However, as per their customary laws, people are only allowed to collect forest products within a specific time and in a limited quantity. Pisang has the deepest and largest forest of the entire area, which is full of chir-pine (Thangsing), cedar (Kelsing), and juniper (Sangsing). Firewood, grass, fallen leaves, and even timber are collected for household use. For the last five to seven years, the locals have also started collecting cordyceps (Yarchagumba) from this forest, which has been a significant source of cash earnings for them.

Another important and traditional occupation of the Ngisyangwas is trade. Their trade history, with a long record of trans-Himalayan trading, is entirely different from that of other Indigenous peoples and ethnic communities in the country. The government of Nepal has started issuing passports to Ngisyangwasi since 1962 with special rights to travel and trade with various countries, including those in South and Southeast Asia. This resulted in business activities extending all over South Asia, even as far as Korea (Gurung, 1976). However, with the cancellation of their special rights to trade and travel in 1976, the people of Ngisyang valley opened their doors to tourism.

Tsum Nubri of Gorkha District

The Gorkha district is situated in the Gandaki Province, connected historically with the creation of modern Nepal and the name of the legendary Gorkha soldiers. It is located at 228 to 8,163-meters above sea level and has an area of 3,610 sq. km. According to the new provincial structure, the Gorkha district has 2 municipalities and 9 rural municipalities, which are divided into 94 wards.

The literacy rate of Tsum Nubri Rural Municipality is 38.6 %, with 50.1% for males and 28% for females (District Profile of Gorkha, 2074).

The study area, Tsum valley, lies in Manaslu Conservation Area under 6 and 7 wards of Tsumnubri Rural Municipality. The eastern part of the conservation area covering the two wards Chumchet and Chhekampar is termed Tsum valley or Syar. Although the conservation area has its own rules and regulations, the Indigenous peoples have been following their customary institutions and governance systems in the management of their natural resources and biodiversity with little influence from the conservation regulations. Tsum valley was a restricted area until it was opened for trekking in 2008. A serene Himalayan valley, the Tsum valley is a sacred Himalayan pilgrimage site and is rich in ancient art, culture and religion. It has a long history of Buddhism, with the Buddhist saint Milarepa believed to have meditated in the caves of its mountains. Traditionally, the valley was a culturally distinct geographical region called “Tsum Tso chuksum,” which means thirteen settlements ruled as a single territory. The ancient remains of the Tsum are still visible today. The valley also boasts some unique and historic monasteries, including Rachen Gumba and Mu Gumba, which lie on a pretty plateau nestled in the lap of the valley, and Gumba Lungdang, situated at the base of a conical hill against the main slope of Ganesh Himal.

Due to its remoteness and inaccessibility, this sacred valley and its people have been bypassed by mainstream development for centuries. As a result, the unique culture of the valley has remained intact, including the celebration of many festivals throughout the year. Several mask dances and rituals are held in local monasteries as well as numerous festivals, preserving the valley’s century-old practices, such as Losar, Dhachyang, Saka Dawa, Narag and Faning. Lhosar (New Year) is celebrated in the Nepali month of Falgun.

The people of Tsum valley are known as Tsumba, one of the mountain Indigenous peoples of Nepal. They speak their own language, Tsum Ke. The people have a strong belief in Buddhism.

They pray to Buddha, Gururimporche (Padmasambhava), and some bodhisattvas. They install prayer flags, kata, or mani walls, burn butter lamps in monasteries, and believe in the reincarnation of lamas. They still perform numerous rituals and festivals against devil entities for the protection of their communities, environment and land. However, the practices of slaughtering of animals on an altar to honor deities as in Nepali culture are strictly prohibited as they adhere to the principles of non-violence.

The Tsumbas' ways of life are determined by Buddhism's principle of non-violence. They live in harmony with nature, having a close relationship with nature, natural resources, wildlife and biodiversity. Hunting, slaughtering and honey bee collection have been completely banned in the Tsum valley for ages. The valley is uniquely rich in wildlife species, notably the Himalayan Thar and Blue sheep which congregate in herds of 50 to 200. This area is a good habitat for musk deer, blue sheep and snow leopard. The Tsum valley is quite rich in non-timber forest products (NTFPs) particularly *yarchgumba* (cordyceps), *panchaule* (*Dactylorhiza hatagirea*), *nirmashi* (*Aconitum Orochryseum*). Agricultural production and livestock management are the people's main source of income. The main crops grown are *karu* (naked barley), buckwheat, maize, potato and wheat. Farmers also produce mustard, beans and soybean.

ROLE OF INDIGENOUS PEOPLES AND THEIR CUSTOMARY INSTITUTIONS IN NBS

Indigenous peoples have their own identities, histories, traditional cultures and practices, which include traditional knowledge and customary institutions for conserving and managing natural resources since time immemorial. Their cultures and traditions are dynamic and responsive to the realities and needs of their times.

Some of the researches carried out by CIPRED (www.cipred.org.np) already show that Indigenous peoples' customary laws and practices have an important role in the conservation and sustainable management of land, forest, water, biodiversity and other natural resources. They have collective ownership and management of their natural resources. Their customary laws and practices on inheritance, dispute resolution, administration of justice, and governance system may or may not be formally recognized or may only be partly recognized in statutory law. Their customary laws, compared to the statutory laws, are more closely attached to their cultures. The case studies from Manang and Gorkha districts show how customary institutions have been contributing and performing an important function in the sustainable management of the natural resources and biodiversity.

Case 1: Mithewa of the Ngisyangwas

Manang valley is known as Ngisyang valley and its residents are called Ngisyangwas in the local dialect. The Ngisyangwas have customary institutions called Mithewa. The Mithewas have been playing a crucial role in the management of natural resources in the Ngishyangba communities. In recent years, the Mithewa have taken the responsibility of administering and managing various aspects of the communities in Ngishyang valley that for centuries had mainly been administered and maintained by the Dhawa Shyarpa. The Dhawa Shyarpa, also called Kha-mba Lhen-nji, means the head or leader of the village.⁶ Like the Dhawa Shyarpa, the Mithewas have effectively accomplished the responsibilities of conserving, promoting, and managing the forest and agricultural and pasture lands. The Ngisyangwas for instance have imposed a complete ban on the collection of green wood, and those breaching the ban are subject to monetary fines. They have also restricted the cutting down of trees from around the sites of religious importance, such as monasteries, sources of holy water and ponds believed to be dwelling places of L-hu, the snake god.

The Ngisyangwas still practice transhumance to protect their crops from livestock. For centuries, they have been conserving, managing and using forests and agricultural and pasture lands according to the guidance and instruction of the Dhawa Shyarpa who determines the time and quantity for harvesting forest resources, among other things. The protected forests of the Ngisyang valley are seasonally opened for collection of firewood, timber and fodder. All villagers involved in agricultural activities have their own protected forest locally called “Teising.” At present, there is a trend to protect trees on sloped land and around the monastery. The Ngisyangwas seem to be afforesting and protecting plants in order to mitigate the hazards posed by landslides, rock slides, and floods. In this way, these customs and traditions have been effective tools in protecting the biodiversity, forests, lands and in maintaining ecological balance. Their practice of transhumance of livestock to preserve pasturelands, planting of trees on the slopes, control of illegal hunting, caretaking of forests, ban on collecting green tree branches and foliage and the maintenance of Teising are all rooted in the NBS concept.

Dhawa Shyarpa

Apart from their tasks related to conservation and sustainable use of natural resources, the Dhawa Shyarpa carry out social, cultural, political, legal, and even development work. They also perform judicial functions such as hearing disputes in the village and slapping fines for violating the customary laws. They amend, modify and reform the customary laws and practices and implement them as suitable to contemporary society. Thus, they play a prominent role in carrying forward the customs, customary laws, village practices and maintain law, order, peace, and harmony in the community. They also play vital roles in the continuation of religious and cultural activities including conserving and caretaking of forests, controlling illegal hunting and managing pasture and farmlands. Scheduling the time for seasonal transhumance of livestock, they specify when to move the cattle to pasture lands and bring them back to the village.

Similarly, they specify the time and quantity of firewood collection from their forests. The decisions regarding these activities are taken collectively through a joint meeting of Dhawa Shyarpa. Community members, failing to abide by the decision, are fined a certain amount of money. Those

intentionally disobeying the decision are fined double the specified amount. However, community members who disobey the laws more than two times are fined through a joint meeting of all the clans in the village. Since the locals are generally honest and obedient, rather than appealing the decisions, they simply follow the prevailing customary law and practices.

Previously, the Dhawa Shyarpa from Manang were considered superior because they had special powers over all the other Dhawa Shyarpa throughout the district. For example, people dissatisfied with decisions taken by the Dhawa Shyarpa of Ngishyang community would go to the Dhawa Shyarpa of Manang and accept their decision as a final verdict. In the past, the Dhawa Shyarpa of Ngishyang Valley would look after the political and administrative activities and facilitate the people from Nar and Phu to settle disputes.

Dhawa Shyarpa is selected through a democratic process based on their age. According to the customary practice, the first four eldest persons of the village are selected for each of the Dhawas and Shyarpas. To be a Dhawa or Shyarpa, one must be between 18 and 70 years of age. If two or more persons are of the same age, the community uses a lottery system for the selection. As per the ancient practice, the Dhawa Shyarpas commit to a one-year term. Following the completion of their tenure, Shyarpas are routinely appointed as Dhawas for the next consecutive year due mainly to the seniority of their age. Those who have once become Dhawas can be reappointed to the post only when all the family heads in the village complete their tenure.

Dhawa Shyarpa in Ngishyang Valley are selected on the customary darting-day or an archery festival called Mitha that occurs in March and April. Dhawa Shyarpa are selected by a proportional representation system based on their clan and total households in the village. There are mainly three clans in Pisang village: Sakrong (Gurung), Puine, and Thate (Katuwal). Two each from the Sakrong and Puine clans are selected as Dhawa Shyarpa. Since the Thate clan permanently holds the post of Katuwal, no one from this clan is eligible for selection as Dhawa Shyarpa. During the process of selecting Dhawa Shyarpa, each clan holds its own meeting and makes a unanimous selection. Information about the selection is given through the Choun or messenger. Once the Choun circulates the information regarding the selection of the Dhawa Shyarpa, the village people, in order to recognize and congratulate their newly elected representatives, go to their homes and offer a locally made, home-brewed barley and millet beer, and a khada, a silk scarf used mainly by Buddhist communities on auspicious occasions.

Case 2: Shyagya, customary institution of Tsum Nubri communities in Gorkha district

Shyagya is the customary institution of Tsum Nubri Indigenous peoples in the Gorkha district. Shyagya is a culture of non-violence rooted in the Buddhist religion. This tradition in Tsum valley is coded into a 7-point rule: no hunting, no killing of animals (both domestic and wild), no trapping of any wild animals, no honey hunting, no forest fire, no trade (selling) of domestic animals for slaughtering, and no entry for meat trade. The 7 points were written in the Sambota script in 1939 (1996 BS [Bikram Sambat, official Nepali calendar]) at the initiative of the chief Lamas from Mu Gumba (Gumba: Buddhist monastery), Labrang from Niley, Ngakyu, Khangsar, Ghanjen of the respective settlements and Venerable Drukpa RimpochhevSerap Dhorje.

The collective commitments through signing the declaration note was formalized in 1939 (1996 BS) and was signed by all the people. The declaration note was translated into the Devanagari script in 1972 (2029 BS), with 221 local households taking oath in the presence of Venerable Drukpa Rimpochhe Ngawang Khenrap Lama.

The boundary of the non-violent area, referred to as Tsum valley or Shyagya territory, was self-declared by its inhabitants in 2008 (2065 BS). That same year, the District Development Committee (decision by DDC council) Gorkha district endorsed the declaration of the Shyagya territory, and in 2012 (2069 BS) the extension of “Shyagya territory” in lower Tsum was held. The Tsum Welfare Committee (TWC) established in 2006 has the objective of ensuring the conservation of biodiversity and cultural heritage of Tsum valley.

Gorkha has two Shyagya Conservation Area Management Committees. One is in the Upper Tsum valley covering Ward Number 7 of the Tsumnubri Rural Municipality, and the other is in Lower Tsum valley covering Ward Number 6 of the Chumchet region of Tsumnubri Rural Municipality. The executive Committee of the Shyagya Conservation Area Management Committee in Upper Tsum valley has 35 members while that of the Lower Tsum valley has 17 members. Each settlement in the Shyagya zone is represented by one female member and two male members. These Committees have been formed under the government-run Manaslu Conservation Area Project and are responsible for conservation and community development activities, for example, improving livelihood in Tsum valley.⁷

Ghenchen (village leader), Syara (clan leaders), and Ghyange, supporter to the Ghenchen nominated by the village assemblies, are responsible in settling community disputes in line with the Shyagya traditions.

The declaration of the Shyagya zone and regular updates of rules and regulations are done during the series of festival events. The 7 major rules are strictly followed in each settlement with the active mobilization of local leaders, monastic groups, and Laprangs. Furthermore, it is fully supported by representatives of wards under the Tsumnubri Rural Municipality and Conservation Area Management Committee (CAMC) representatives under MCAP. Since the last few years the Shyagya Conservation Area Management Committee has imposed heavy financial penalties from NPR 10,000.00 to 50,000.00, which also apply to locals who violate the 7 rules. Violation cases however are low, ranging from just 1-2 cases each year in both Tsum valley areas. The Shyagya Conservation Committee organizes regular forest patrolling and frequent meetings for monitor-



Public notice of 7-point rules for Shyagya region

ing and strict observance of Shyagya rules and regulations. The Shyagya team has been working very effectively on its anti-poaching campaign since the beginning, and during the insurgency period in Nepal in 2005 they were able to arrest 3 Tibetan poachers from the Upper Tsum who they handed over to the Tibetan local government. Thus the Shyagya has also been useful in patrolling the territories on the international border.

The Shyagya has further played a crucial role for conservation of endangered wildlife, particularly for the Snow leopard, Himalayan brown bear, and Musk deer in that region. The Shyagya committee imposes a strict ban on forest fires, which has remarkably contributed in sustaining wildlife habitat and wildlife itself. This resulted in increasing wildlife sighting in lower Tsum valley that had been rare till 2012 around the region from Lokpa to Chumling. However, in 2019 the MCAP wildlife survey team had seen over 11 bears around the same region, and people also frequently saw the Himalayan black bear. The increasing trend of wildlife sighting is due to the strict ban on wildlife poaching by the Shyagya Conservation Committee.

The complete ban on forest fires also greatly increased the availability and production of non-timber forest products and high value medicinal plants like Yarcha Gumba, Kutki, Panchaaule, among others, in the Shyagya region. The strict ban on natural honey bee extraction also contributed to the pollination of different plants species, thereby increasing the expansion and growth of natural vegetation. Encroachment and destruction of natural forest become less frequent as the natural forest area is considered a prime habitat for wildlife.

ISSUES AND CONCERNS OF INDIGENOUS PEOPLES ON CLIMATE POLICIES INCLUDING NBS

Nepal lacks a concrete national legal framework governing forestry, biodiversity and climate sectors that are supportive of Indigenous peoples. Of late, with the paradigm shifting towards nature-based solutions for the climate crisis, Indigenous peoples are faced with issues related to their rights and well-being.

Nepal's forestry and environmental laws do not recognize customary rights yet. There have been occasional mentions of the importance of customary rights and institutions in some policies and strategies, but without legal recognition, these could eventually be ineffective in advancing solutions to problems regarding the climate, biodiversity and forestry sectors in ways that do not undermine Indigenous peoples' rights, especially with their ability to continue their traditional governance systems of resource management. The lack of legal recognition will also compromise their ability to access equitable benefits from projects/interventions implemented by the government.

The concept of NBS is nothing new for Indigenous peoples; their lifeways have always remained nature-based. With the approach still controversial for reasons such as the lack of clarity in the definition itself, there is a risk for Indigenous peoples of nature-based solutions being taken from a bio-physical perspective only, oblivious to the human rights dimension. If this happens, the rights of Indigenous peoples will be in jeopardy. This will invite situations where they will be displaced from their own ancestral lands and territories, and their access to natural resources including forests and water can be curtailed by the government, criminalizing such acts. [Example can be the chepang boy incidence].

Besides, a plethora of issues and challenges are yet to be overcome from the perspective of Indigenous peoples, such as:

- Lack of awareness and capacity of Indigenous leaders to work towards securing legal recognition for their lands and forest tenure
- Lack of understanding on the role and contributions of Indigenous peoples' traditional knowledge and cultural practices to sustainable management of natural resources and their symbiotic relationship with nature
- Lack of knowledge/willingness on the part of local government authorities (such as rural municipality chairperson, vice chairperson, ward chairpersons) to formulate local laws that ensure the recognition of Indigenous peoples' customary institutions and governance systems such as Shagya, Mithewa, and Mukhiya systems. Also, the government's policies and programs are devoid of indicators that are useful in recognizing such institutions and systems.
- Centralized decision-making process and its influence on local laws
- Dependency mentality of local leaders
- Geographical remoteness (lack of transportation, road access, internet access, electricity and telephone services, which make it difficult to arrange frequent meetings to discuss

the legal issues and also government's views, attitude and role in policy making, management and implementation of NBS, among local leaders). This problem is compounded by the lack of adequate resources to organize such discussions regularly in the villages.

- Non-accountability of Chief administrative officer to the local leaders and non-sensitivity to IP issues (Chief administrative officer is more accountable to the central government, and gets appointed and transferred anytime without consultation with the local government)

CONCLUSION AND RECOMMENDATIONS

Customary rights and governance are the basis for the success of nature-based solutions for a just and sustainable environment and development. There are multiple global efforts already dealing with natural ecosystems that overlap with land and territories, the homeland of many Indigenous peoples and local communities. However, the experience and the forms of management of these areas do not take into consideration their issues and concerns for recognition of their collective land and forest tenure rights in order for them to continue their traditional knowledge and cultural practices for their sustainable livelihoods and well-being of their communities. Indigenous peoples have their wisdom and way of living that protect the environment and ecosystem that provide food and economy.

The global problems that sought to be resolved through NBS also affect Indigenous peoples and local communities, as they are also vulnerable to the climate change impacts despite having the lowest ecological footprint. With this in mind, developing a lens that focuses on Indigenous peoples, human rights, self-determination, FPIC, full and meaningful participation, benefit sharing, safeguards, among others, are of utmost importance.

The economic importance of nature or "assets" to generate future benefits in the name of the 'green economy' should be thoroughly discussed, along with how private sectors and the government are investing in such programs. There have been recorded unintended impacts of some projects and solutions to Indigenous peoples in Nepal and many countries in Asia where collective rights over their lands, territories and natural resources are not recognized.

For Indigenous peoples, nature has more than financial and economical values. Nature is their asset as it is interconnected with culture and spiritual values. Therefore, recognizing legal rights of Indigenous peoples and local communities over these lands and implementing NBS under their leadership, leveraging their traditional and lived knowledges through their customary institutions will ensure efficiency, effectiveness and success. This will also address the issue of persistent poverty and lack of development amongst the world's most marginalized communities, as the world supports them to restore "nature." This will also meet the goals of the government for a just and sustainable development.

For nature-based solutions to really work in the interests of Indigenous peoples at the national and global level, the following recommendations are made:

- Legally recognize customary governance systems. Apart from addressing the issues of tenure rights of Indigenous peoples, this will make the integration of traditional knowledge in national plans and policies on sustainable natural resources management and equitable benefit sharing practicable.
- To truly go nature-based, adopt Indigenous peoples' traditional knowledge/customary practices into national interventions. Also, incorporate indicators pertaining to Indigenous peoples' traditional knowledge and customary practices in natural resources management and their recognition by the government in government's plans and policies. Indigenous peoples have been practicing NBS for ages. It is through this that they have been able to sustainably manage natural resources.
- Set in place strong safeguard mechanisms, as NBS interventions pose the risk of forcible displacement of Indigenous peoples from their lands and territories. Consultation with Indigenous peoples and obtaining their free prior and informed consent is a must before making any interventions in their lands and territories.
- Ensure coordinated actions among government, the private sector and Indigenous peoples prior to any NBS intervention. Further, consider the full and effective participation of Indigenous peoples in the planning, implementation and monitoring processes.
- Build capacity, through awareness/sensitization programs, of relevant stakeholders including local representatives, government officials, Indigenous peoples' leaders and others on changing the paradigm on the climate discourse, including NBS, relevant international legal frameworks and the importance of TK in nature conservation and climate actions.
- Address technology and infrastructure accessibility issues faced by Indigenous peoples' leaders.

Endnotes

- 1 Rural municipality and municipality are two different administrative divisions in Nepal. Both are sub-units of a district. Rural municipality was previously called Village Development Committee (VDC) before 2017.
- 2 With Nepal adopting a federal republic governance setup, the country has three state structure levels—federal, provincial and local. Under local level are the metropolis, sub-metropolis, municipality and rural municipality.
- 3 As per the Forest Act, “national forest” means a forest, forest conservation area, community forest, partnership forest, religious forest, lease-hold forest, national forest within Province or inter-Provincial forest which is managed by the Government.
- 4 As per the Forest Act, forest users are those wishing to utilize forest products by protecting, developing and managing the forest for collective interest who may form a group called forest users’ group. This is not special category for IPs. The users/user groups may constitute IPs too. This is a blanke term and therefore this does not discriminate IPs either positively or negatively. However in community forestry management, there are certain reserved seats for IPs and women.
- 5 Called the ‘Pro-Poor Leasehold Forestry’ (PLF) program in English, the Kabuliyati Ban Program is a participatory forest management modality introduced in 1992 for 10 years by Nepal government. The government continued the program, later with formation of leasehold groups. The leasehold forestry for poor is leased for 40 years and its tenure could be extended for another 40 years if the leaseholders manage the leasehold properly. The royalty is exempted to leasehold forestry for poor.
- 6 In terms of numbers, there are four Dhawas (Kh-ha-mwas), four Shyarpas (Lhen-nji) and one Katuwal (Choun); the Choun is a messenger called Thopip in the local dialect.
- 7 <https://report.territoriesoflife.org/territories/tsum-valley-nepal/>.

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Indonesia: the Dayak Jalai, Kendawangan, Tae, Sisang and Iban Sebaruk in West Kalimantan

By Institut Dayakologi

INTRODUCTION

Indigenous peoples are among the most vulnerable to the impacts of the COVID-19 pandemic, given their marginalization even before the pandemic came. This has multiplied the burden they experience due to the effects of climate change. Nature-based Solutions (NBS) have a great potential to contribute in overcoming the many impacts of both these health and ecological crises. This includes not only supporting the ability of communities to cope with their immediate effects but more importantly in helping to create a more sustainable and resilient post-COVID world. For Indigenous peoples, the potential of NBS to achieve this can only truly be realized if properly framed and implemented by the state. This would mean NBS that are human rights-centered and recognize and support the rights of Indigenous peoples including to their lands, forests and territories; their indigenous knowledge, practices and innovations; and their overall contribution to conserving and maintaining the environment, including climate adaptation and mitigation.

At the global level, efforts are being made to operationalize nature-based solutions. The United Nations Framework Convention on Climate Change (UNFCCC) Permanent Forum on Finance was set to discuss financing Nature-Based Solutions in its Forum in 2021. The Standing Committee on Finance provides advice to the UNFCCC Conference of the Parties and ultimately to the Green Climate Fund (GCF) where NBS is gaining momentum as a key factor in its future portfolio. The GCF is currently developing various sectoral guidelines for Accredited Entities in preparing their portfolios, and one of these guidelines is on land and forests, which views nature-based solutions as a potential theme for GCF proposals.

Even before the pandemic, several Indigenous peoples' organizations had made various efforts to provide input into discussions and initiatives on NBS being carried out globally. This includes the 2019 Climate Action Summit, United Nations Convention on Biological Diversity, UN Environment Programme, International Union for Conservation of Nature, among others. Although Tebtebba Foundation believes that Indigenous peoples are already practicing nature-based solutions, a comprehensive understanding by Indigenous peoples' organizations about NBS as defined by external actors is still lacking. In the same way, synergistic actions and strategies on how to engage with agencies that promote NBS still need to be developed.

The GCF Indigenous Peoples Policy, in our view, captures the spirit and purpose of what NBS is for Indigenous peoples. The Policy aims, inter alia, to “support and promote the welfare, positive contribution, and leadership of Indigenous Peoples to climate change mitigation and adaptation, based on local knowledge systems, livelihoods, systems and practices for sustainable resource management, in a manner that is accessible, rights-based, gender responsive, culturally appropriate and inclusive.” This Policy’s full and effective implementation will support and strengthen recognition of the perspectives and priorities of Indigenous peoples on NBS. As such, it is imperative to see how the GCF has implemented its own Indigenous Peoples Policy in terms of assessing, approving and monitoring approved funding proposals.

Nature-based solutions use restoration, rehabilitation and protection of ecosystems to address social challenges and development goals, including preparedness for global climate change and mitigation of human-caused ecological disasters. They also enable a more holistic and innovative approach to recovery and mitigation of the impacts of COVID-19 as well as climate damage and disaster mitigation. With methods and concepts to optimize wisdom and natural resources to address the problems created by humans themselves, NBS can pave the way for an economy that is more resource efficient, participatory, has local wisdom, is climate resilient and promotes green development.

For the Dayak peoples in Kalimantan, climate damage (the term for climate change and ecological crisis caused by human greed and exploitation) is a very serious problem both in terms of mitigation and adaptation needs. The vast Kalimantan, the Indonesian portion of Borneo island, has been managed, safeguarded, cared for and maintained by the Dayaks for thousands of years with their local wisdom so that it remains intact, exotic and sustainable. Climate resilience and the conservation of Kalimantan forests occur because of the wisdom and culture of the Indigenous peoples who live in the forests.

As currently defined by many international conservation NGOs, Nature-based Solutions refers to actions to protect, sustainably manage and restore natural or modified ecosystems that address social challenges in an effective and adaptive manner, while providing benefits to human well-being and biodiversity (IUCN, 2016). More and more international mechanisms are now referring to NBS as a “new” climate solution, which prioritizes carbon as a commodity.

However, Indigenous peoples emphasize that NBS is not a new climate action and should not be focused on carbon. Nature-based solutions is a concept they have practiced in their territories for centuries, thus the world’s biodiversity remains intact. There is a need to change the paradigm and show that Indigenous peoples and their rights need to be central in NBS discussions.

Thus, the rationale for this study is to place local knowledge and wisdom of Indigenous Peoples as one of the alternative solutions based on nature to reduce the impacts of worsening climate damage and, in addition, of the COVID-19 pandemic that brought the world to a pause in 2020. The study was conducted in four communities of the Dayak peoples in Sanggau and Ketapang Districts in West Kalimantan. It shows how the Dayaks’ local knowledge and customary practices in managing their lands, forests and natural resources as well as in mitigating disease and outbreaks contribute to nature-based solutions in reducing and coping with the impacts of climate change and the COVID-19 pandemic.

STUDY AREA

Indonesia's rainforests are among the richest in the world in terms of biodiversity and cover most of the planet's tropical peat land. Although Indonesia lost 6 million hectares of tropical forest between 2000 and 2012, its land area is still 52% covered by forest, about half of which qualifies as primary forest. The total forest area is 128 million hectares.¹ The 2015 Directorate General of Forestry Planning and Environmental Management statistics showed that Conservation forest area covers 27.4 million hectares, Protected forest 29.7 million hectares, Limited production forest 26.8 million hectares, Production forest 29.3 million hectares, and the forest area that can be facilitated is 12.9 million hectares.

Indonesia includes Kalimantan, the southern portion of Borneo, the world's third largest island. Kalimantan's geographical position is right on the Equator, resulting in its having a tropical climate with high humidity. This climatological condition is the basis for the development of various tropical natural resources and biodiversity. The richness of Kalimantan's natural resources is in the form of vast lands, stretches of green tropical rain forest and billions of cubic mineral deposits. These resources, however, have been subjected to extensive exploitation largely by mining and palm oil concessions in the past decades. According to Ministry of Forestry data, the deforestation rate in Kalimantan from 2000 to 2005 reached around 1.23 million hectares. This means that around 673 hectares experienced deforestation every day during that period. Kalimantan had only 25.5 million hectares remaining forests in 2010, according to Greenpeace.²

Administratively, Kalimantan is divided into four provinces, namely Central Kalimantan, East Kalimantan, South Kalimantan and West Kalimantan. West Kalimantan occupies an area of 14.6 million hectares, representing 7.76% of the total area of Indonesia. Of this area, 3.7 million hectares are government conservation areas. Most of the remaining land is handed over by the government to the private sector for the development of large-scale investments, mainly oil palm plantations, mining, logging or pulp and paper. West Kalimantan has vast natural resources based on forests and land but these have been massively exploited since the 1960s. This has brought negative changes to the environmental conditions, especially for managing forest and customary areas, some of which have been converted into large-scale industrial development. An impact of this unwise forest area management are ecological disasters such as floods, smog and drought that have occurred in almost all areas in West Kalimantan.

The concession areas of oil palm and mining companies scattered throughout the districts of West Kalimantan are generally in the living areas or customary areas of the indigenous communities. Ironically, companies are flourishing in the province but have barely contributed to the general welfare and guarantee of human rights for the Indigenous peoples. The combined conservation zones, to which the Indigenous peoples have no access, and the concession areas have shrunk community access areas to some 0.7 million hectares.³ A resulting problem is poverty. West Kalimantan Province, which has 12 districts, has the highest poverty indicators among the four provinces of Kalimantan. Its population living below the poverty line is 7.37%.⁴

The indigenous communities in West Kalimantan depend on forest areas as a source of livelihood through the use of non-timber forest products such as rubber, resin, rattan, fruit and for cultivation areas. Of 2,109 villages, 718 villages/hamlets are managed by Indigenous peoples in

forest areas that need to be recognized through formal land titling by the government in order to access forest areas. PPSDAK Pancur Kasih geospatial data showed that at least 11.83% of customary areas in West Kalimantan need legal protection.⁵ Currently there are 8 Regional Regulations on the Recognition and Protection of Indigenous Peoples in West Kalimantan, including in Ketapang and Sanggau districts. At least 16 communities of Indigenous peoples, with an area of 528,152.82 hectares of customary lands, have received recognition through 18 District Decrees in 5 Districts (Sanggau, Landak, Bengkayang, Melawi and Kapuas Hulu). For customary forests, an area of 58,237.44 hectares have been legally recognized by 10 Decrees issued by the Indonesian Ministry of Environment and Forestry.

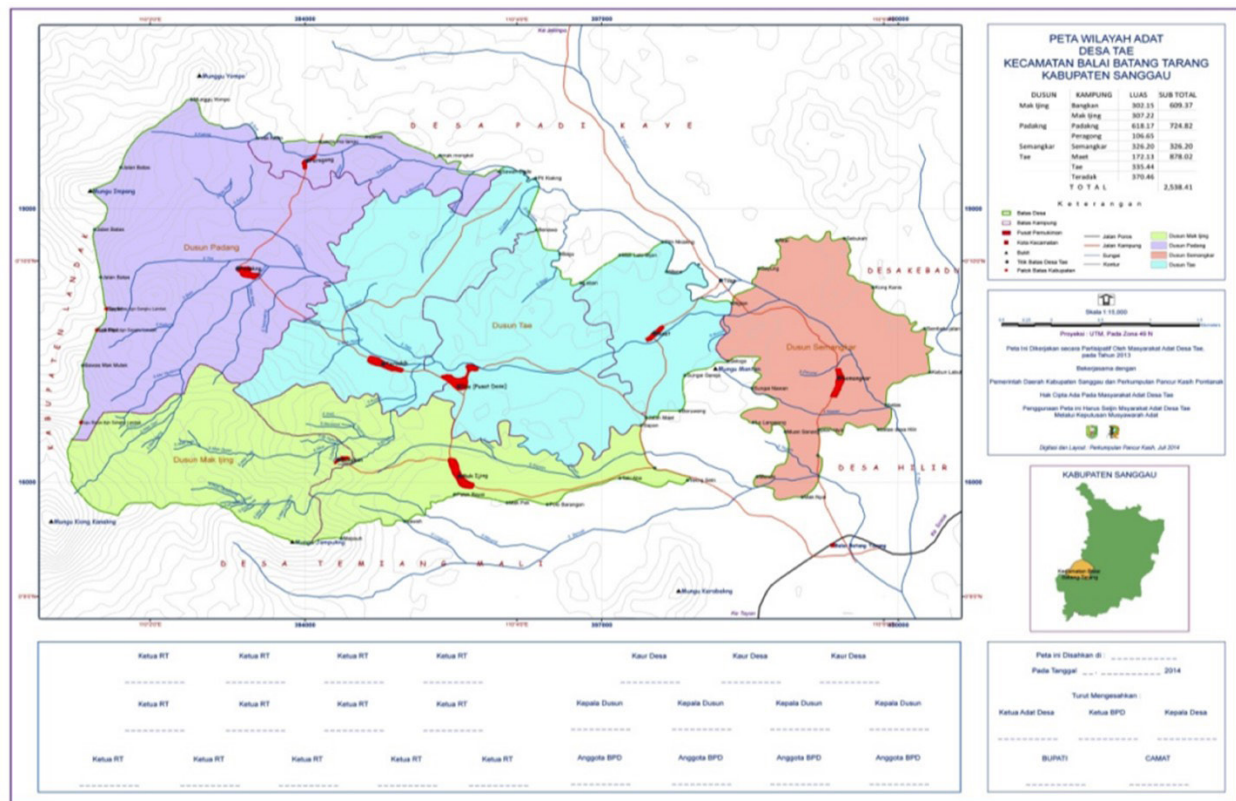
The study was conducted in the Dayak villages in Tiong Kandang and Tampun Juah Communities in Sanggau District and the Jalai and Kendawangan Communities in Ketapang District. In the former, the sampled areas were Ketemenggungan (Customary Administration of) Tae, Ketemenggungan Sisang, Kampong Segumon and Ketemenggungan Iban Sebaruk in Sungai Sepan Village. In the latter, these were Kampongs of Silat Hulu, Tanjung and Batu Menang. The indigenous communities in Sanggau District have been legally recognized; those in Ketapang District have not received formal recognition.

Tiong Kandang Community, Sanggau District

The Tiong Kandang Community are the Indigenous people who live around Tiong Kandang Hill, most of which is located in Balai Sub-district of Sanggau District. They have cultural, spiritual and historical ties with Tiong Kandang as one of the Spiritual Centers of the Dayak peoples in Sanggau District. The Ketemenggungan/Customary Administration of Tae Indigenous People is located in 8 Kampongs in Tae Village (Mak Ijing, Bangkan, Tae, Teradak, Padang, Peragong, Semangkar and Maet). Its population is 1,543 people, consisting of 740 women and 803 men (Statistics Center Bureau of Sanggau 2017).

Ketemenggungan Tae is one of the Tiong Kandang Communities that has received formal legal recognition through a decree issued by the Sanggau District Government in 2018. The Decree established the Ketemenggungan of Tae's Customary Law Community in Tae Village, Sanggau District with an area covering some 2,537 hectares. The customary forest in the Tae Ketemenggungan Customary Area with about 2,189 hectares has also been legally established through a Decree of the Minister of Environment and Forestry in 2018.

In the Tae customary area, 86% is customary forest, which is still generally managed by the people based on their local knowledge. The Tae customary forest surrounds the 8 kampongs. The Tae community utilizes the surrounding forest as a source of livelihood and a center for cultural identity and local knowledge. Community interactions with the surrounding forest area involve looking for fruits such as durian and rattan and natural honey, performing customary rituals, collecting bamboo for woven materials for household use, tapping palm sugar, tapping rubber, and hunting, among others. The people have customary laws relating to procedures for opening gardens and prohibitions in farming, skills in processing tree bark to make traditional clothing, processing woven rattan and bamboo to make mats and walls, houses, baskets for harvesting durian, and mixing traditional medicinal plants.



Map of the Tae Ketemenggungan customary area facilitated by the collaboration of the Tae Ketemenggungan Indigenous Community, the Regional Government of Sanggau District and the Pancur Kasih Kalimantan Natural Resources Management Empowerment Institution (PPSDAK-PK) and Institut Dayakologi (ID) since 2011

Tampun Juah Community, Sanggau District

The Tampun Juah Community lives around Tembawang Tampun Juah. In a broad sense, they comprise all groups of Indigenous peoples who originate from Tembawang Tampun Juah or who have cultural and historical ties to the Tampun Juah Ancestral Land. Specifically, the research involved the Ketemenggungan of Iban Sebaruk in Malenggang and Sungai Tekam villages with a population of 5,796 (2,762 women and 3,034 men) and Ketemenggungan Sisang, Lubuk Sabuk Village with a population of 2,901 (1,325 women and 1,576 males).⁶ The sampled villages in the Iban Sebaruk District were Guna Baner Village, Sungai Tekam Village and Iban Sebaruk Ketemenggungan in Kampong Segumon in Lubuk Sabuk Village, all in Sekayam Sub-District.

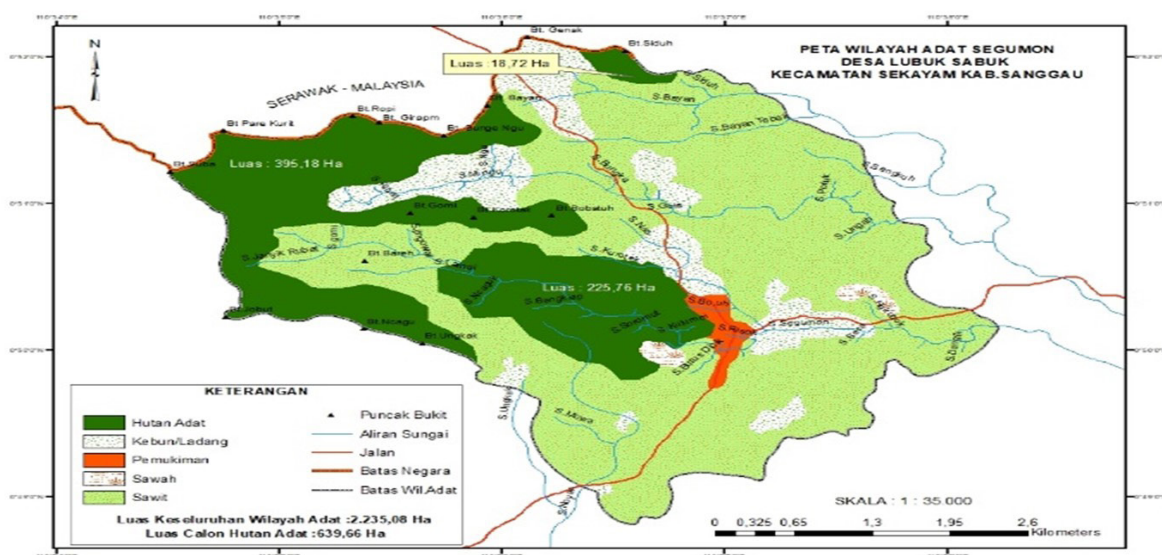
Kampung Segumon in Lubuk Sabuk Village

Kampung Segumon is one of the kampongs of the Sisang Dayak Indigenous Community and is located in the Sisang Ketemenggungan area. The kampung is directly adjacent to the customary territory of the Ketemenggungan of Iban Sebaruk, in particular Sungai Tekam Village. Kampung Segumon consists of three hamlets, namely, Segumon Hamlet, Segumon Jaya Hamlet and Segumon Mawa. It is accessible from Sarawak, Malaysia.

The Kampung Segumon's Indigenous people farm and have similar local knowledge in natural resource management as the Dayak Indigenous people in general. This knowledge is reflected in how they control their land and manage, regulate, maintain and protect their customary territory. They also face various obstacles relating to management of their natural resources. The flatland in the Segumon Customary Area has been used as oil palm plantations, either privately/individually owned or managed by a company. However, not all Segumon people give up their personal lands or customary lands; many still maintain their local knowledge-based crop farming, such as pepper, rubber and vegetable gardening as additional livelihoods. Before oil palm plantations entered Segumon, pepper and rubber had been the main priorities in meeting their basic needs.

The indigenous territories in Kampung Segumon have land titles. A Sanggau District Decree of 2018 established the Sisang Indigenous Peoples, Kampung Village, Lubuk Sabuk Village, Sekayam Sub-District, Sanggau District with an area of 2,235 hectares of customary territory. Their customary forest of around 651 hectares has also been legally established by a decree issued by the Minister of Environment and Forestry in September 2018.

The following is a map of the customary area of Segumon Village, done through the collaboration of the Indigenous People of Kampong Segumon Ketemanggungan Sisang, the Sanggau Regency Government and the Pancur Kasih Kalimantan Natural Resource Management Empowerment Institute (PPSDAK-PK) and Institut Dayakologi (ID) since 2011; participatory mapping was carried out in 2017.



Ketemenggungan Iban Sebaruk

The Dayak Iban Sebaruk or the Tanah Kedieh Iban Sebaruk Community is one of the Dayak groups from the Ibanic family in the eastern part of Sekayam Sub-District (border between Indonesia and Malaysia). The Ketemenggungan Iban Sebaruk Customary Area is located in Malenggang and Sungai Tekam Villages. The research was conducted in Kampong Guna Baner of Sungai Tekam Village.

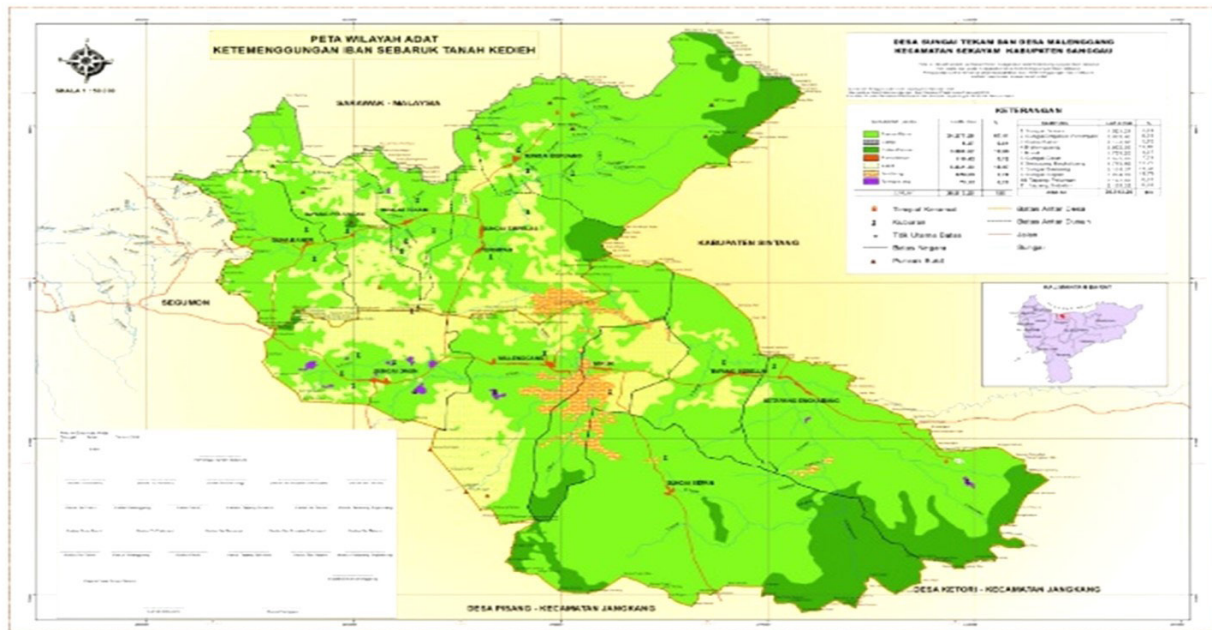
The Ketemanggungan Iban Sebaruk Indigenous people have secured a land title for their customary territories. A 2019 Decree of the Sanggau District established the Ketemenggungan Iban Sebaruk Indigenous Peoples in Malenggang and Sungai Tekam Villages, including Kampong Guna Baner. However, determination of their customary forest is still in the verification process by the Central Government and is encountering technical constraints from overlapping land allocations for oil palm and mining plantations over the Iban Sebaruk customary area.

Most of the inhabitants of Kampong Guna Baner are Dayak from the Iban Sebaruk Kedieh Dayak sub-ethnic group who speak the *Benadai* language. Territorially, Kampong Guna Baner is included in the Menoa Iban Sebaruk Tanah Kedieh, Ketemenggungan of Iban Sebaruk Tanah Kedieh. Its population in 2018 was 591, consisting of 304 men and 287 women.

The situation in Kampong Guna Baner has changed a lot, especially since the entry of oil palm companies. In the last 10 years, conflict over the management of natural resources arose when the palm oil companies PT. SISU, PT. BTL and PT. MKS operated in 2008. There were initially no problems because the residents agreed to the operation, but over time conflicts occurred with the companies. The object of the dispute was a 200-ha land that the residents refused to have the companies take over or to be evicted from. In addition, the companies' actions were deemed unfair, as payments given to the affected residents were not appropriate or too small. The residents held meetings that included the Indigenous leader, the hamlet head, and neighborhood head to resolve the conflict including through customary law. In the last 5 years one resident still sold his land (private) to a palm oil company. However, no resident during this same period has sold customary land owned communally/collectively to outsiders.

The average resident in Kampong Guna Baner owns 5 plots of land. But some residents own more than 10 plots of land, with an area of more than 10 hectares, which are owned by about 10 people each. The customary areas in the kampong are in areas classified as Protected Forest, Limited Production Forest, Ordinary Production Forest and Cultivation Rights (HGU) for Oil Palm and Mining Companies (gold and bauxite).

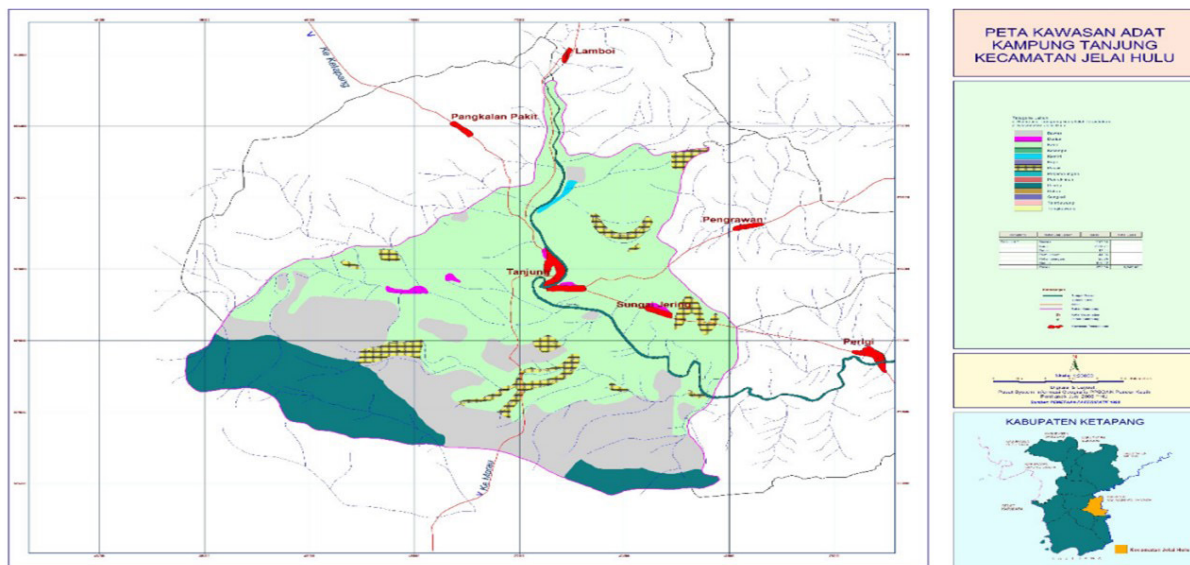
The following is a map of the customary area of Kampong Guna Baner, made through Participatory Mapping in 2018 of the Indigenous Peoples of Kampung Guna Baner Ketemenggungan Iban Sebaruk and the Regional Government of Sanggau District with the Pancur Kasih Kalimantan Natural Resource Management Empowerment Institute and Institut Dayakologi



Jalai Kendawangan Community, Ketapang District

Jalai Indigenous Peoples, Jelai Hulu

This is a community of the Dayak Jalai Indigenous people who live on both banks of the Jalai River stream. The sampled area taken in Tanggerang Village in Jelai Hulu Sub-District was Kampung Tanjung, with 889 families comprised of 2,818 people (1,419 men and 1,848 women). Administratively, the Tanjung customary territory is located in Tanggerang and Teluk Runjai Villages.

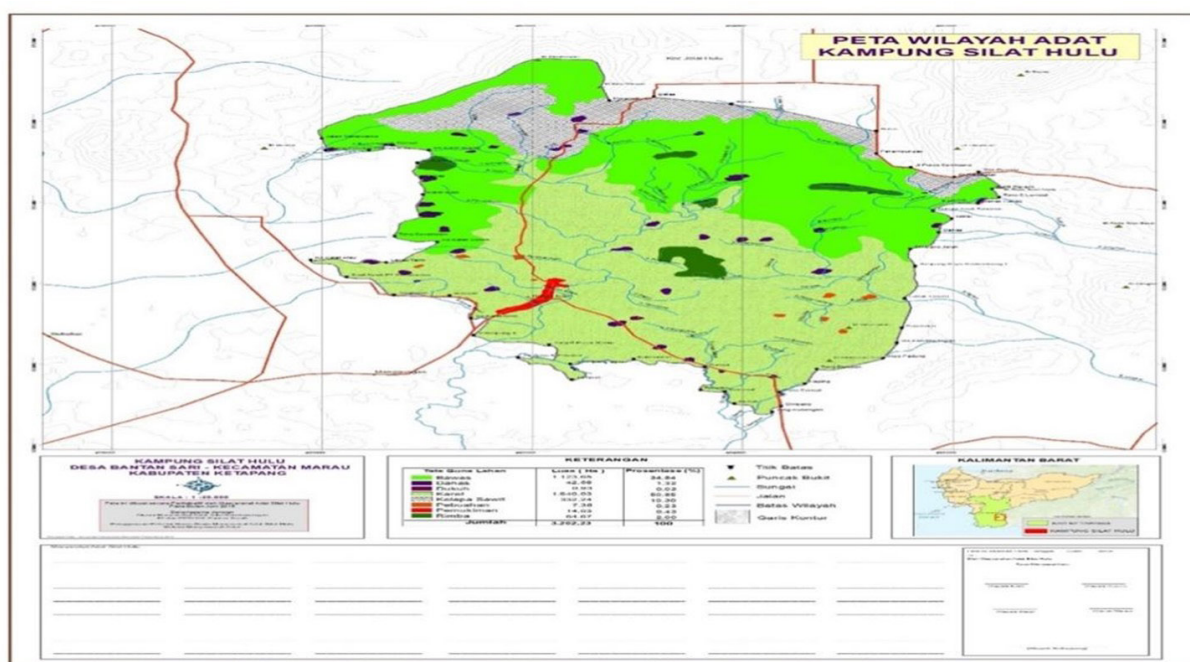


Map Source: Results of Participatory Mapping by the Kampung Tanjung Indigenous People facilitated by Institut Dayakologi in collaboration with PPSDAK Pancur Kasih (1998)

Kendawangan Community, Marau Sub-District

The Dayak Kendawangan Indigenous Community live around the Kendawangan River streams and tributaries. Sample areas were taken in Kampung Silat Hulu of Bantan Sari Village in Marau Sub-District. Administratively, the Hulu Silat Customary Area is located in the Silat Hulu Hamlet in Bantan Sari Village.

The following is the map of the Kampung Silat Hulu area.



Source: Results of Participatory Mapping by the Indigenous Peoples of Kampung Silat Hulu facilitated by Institut Dayakologi in collaboration with PPSDAK Pancur Kasih and AMA-JK (2015)

STATE ROLE AND POLICY ON NBS

The use of nature-based solutions in terrestrial ecosystems, freshwater systems, marine systems and sustainable food systems is highly relevant to the goals set out in the Paris Agreement on Climate Change and the goal of achieving net zero carbon by 2050. Indonesia is one of the countries committed to ratifying the Paris Agreement, which is supported by 195 countries. Each country's commitment is expressed through its National Determined Contribution (NDC) for the 2020-2030 period, in addition to actions before 2020. Indonesia⁷ has started implementing its NDC, carrying out the 3 stages simultaneously. The first stage was the preparation of preconditions that had to be completed before 2020. The second stage is implementation in the first commitment period from 2020-2030. The third stage is monitoring and reviewing NDCs during the commitment period, which includes achievement of targets both in terms of emission reductions and increasing adaptation capacity and increasing resilience including international reporting (coordinated by KLHK/Ministry for Environment and Forestry) and achievement of development targets (coordinated by BAPPENAS/National Development and Planning Agency).

Considering its holistic use to address global societal challenges, NBS has potential to also contribute substantially to the 2030 Agenda of the Sustainable Development Goals. In particular, NBS is directly relevant to SDGs number 2 (food security), 3 (health and well-being), 6 (clean water and sanitation), 11 (sustainable cities and communities), 13 (climate change), 14 (conservation and sustainable use of oceans, seas and marine resources), and 15 (protection, restoration, and promotion of the sustainable use of terrestrial ecosystems).

Indonesia has several laws and policies that support local wisdom and the protection of the rights of Indigenous peoples, especially in West Kalimantan, and Indonesia in general. These are contained in the following:

1. 1945 Constitution Chapter on Government Article 18B: "The state recognizes and respects customary law community units and their traditional rights as long as they are still alive and in accordance with community development and the principles of the Unitary State of the Republic of Indonesia as regulated by law;
2. Law no. 32 of 2009 concerning Environmental Protection and Management, Article 63: "Stipulates policies regarding procedures for recognizing the existence of indigenous peoples, local wisdom, and rights of indigenous peoples related to environmental protection and management," Article 69 paragraph (2) concerning burning land for farming with due regard to local wisdom and Article 70 (paragraph 3-e) "Developing and maintaining local culture and wisdom in the context of preserving environmental functions;"
3. Constitutional Court Decree No. 35 of 2012 that states Customary forest is an ancestral forest located within the territory of the Indigenous peoples.

Regional policies include Regional Regulation No. 1 of 2017 concerning the recognition and protection of Indigenous Law Communities in Sanggau District and Regional Regulation No. 8 of 2020 concerning the recognition and protection of Indigenous Law Communities in Ketapang District. Specifically, the Sanggau local government has issued at least 5 decrees for the recognition of Indigenous peoples in 5 indigenous communities. For West Kalimantan, 8 Districts already

have Regional Regulations on Recognition and Protection of Indigenous Peoples, namely Sanggau, Ketapang, Kapuas Hulu, Sintang, Melawi, Sekadau, Landak and Bengkayang.

Some of the government policies cited above are part of regulations that allow for strengthening and opportunities for NBS implementation. However, a number of these policies have not been maximal in supporting the protection of the rights of Indigenous peoples and in ensuring the implementation of NBS because certain corporate business permits have already been given on ancestral lands and many conflicting laws/regulations hinder this. For example, on the one hand the local wisdom-based cultivation system gets protection and therefore burning land is allowed, but on the other hand the same rules prohibit this. This legal conflict results in the frequent criminalization of Indigenous peoples who do farming, such as had happened to at least 6 farmers in the West Kalimantan Districts of Sintang, Kapuas Hulu, Sanggau and Bengkayang in 2019-2020.

NATURE-BASED LOCAL KNOWLEDGE AND PRACTICES IN OVERCOMING CLIMATE CHANGE AND COVID-19

Climate change

The increasingly severe damage to climate and natural resources and exacerbated by the COVID-19 pandemic is a situation of serious problems and challenges facing Indigenous peoples in Kalimantan, especially in West Kalimantan. The impacts of climate change in Kalimantan are predicted to be very severe because it is situated right on the equator. A World Wide Fund for Nature report projects that if the value of natural capital due to deforestation in Borneo continues to remain at the same point, the Heart of Borneo area will experience the effect of climate change with the risk of forest fires, floods, decline in the quality of human health, changes in agricultural yields and damage to infrastructure.⁸ Sea level rise is expected to cause widespread damage to residential centers. This situation will cause considerable economic damage, which may increase the financing component among local governments, communities and businesses. With a temperature increase of up to two degrees, Borneo's biodiversity, especially marine species, reptiles and amphibians will be severely disturbed and may potentially be destroyed by 2050 if it rises even further.

Global warming that contributes to climate change and damage that affects all aspects of life, including of Indigenous peoples, is also caused by an exploitative, destructive natural resource management system that only profits a handful of investors. For corporations and the state, forests and other natural resources are seen only as economic resources, so the only way to manage them is to seek and extract the results but not wanting to maintain them, let alone restore their original condition. Even after profits are obtained, the Indigenous Peoples and local Communities only get waste, garbage, lose their rights to life and the environment and increasingly are trapped in structural poverty. This, for example, is experienced in the Province of West Kalimantan, which

although rich in natural resources with very wide concessions is still the poorest province in Kalimantan.

For the Dayak Indigenous Peoples, the problem of climate change and damage also affects the sustainability of their socio-cultural, economic and environmental life. Several problems that arise in indigenous communities as a result of climate damage as identified by this study are:

1. The agricultural-cultivation cycle of indigenous/local communities is unstable due to the erratic weather every year, for example, unpredictable rainy and dry seasons. The year 2019-2020 was a very worrying period for Indigenous peoples who engage in farming. In 2020, for example, the rainy season lasted from June to September, which resulted in their being unable to burn (to open up) their fields. As a result, harvest yields were not optimal, and some even failed to harvest.
2. Increased ecological disasters, including floodings everywhere. Several research focus areas, such as Guna Baner, Segumon and Tanjung, were affected by last year's floods which resulted in material and immaterial losses, such as the death of livestock, people being unable to farm and water-logged garden plants. In addition, several roads connecting district and sub-district cities were submerged, cutting off transportation.
3. Species in forest/nature continue to decrease and some even begin to disappear for good. This condition is happening in all areas because the forests are continuously deforested by big companies; as a result many species are becoming increasingly endangered, for example, medicinal plants, fruits and hardwood, such as Belian wood.
4. Hunting and gathering especially for local medicinal herbs is getting more and more difficult. This condition also occurs in all areas as a result of the increasing loss of forests, which serve as the center of life and community livelihood source.
5. Fish in the river are decreasing because many *sepan* or local oases are drying up and changing their functions. This condition is also experienced by all villages because many rivers have dried up due to oil palm and mining companies' operations, as well as rivers whose water discharge is no longer regular.
6. Clean water crisis. Rivers easily turn turbid, easily flooded and dry up. In all areas it is increasingly difficult to find rivers with potable water for consumption due to palm oil waste, such as in Silat Hulu, Tanjung, Guna Baner and Segumon. Even in Kampong Guna Baner, residents are forced to bathe in river water that is like mud puddle.
7. All kinds of unusual diseases both chemical- and natural-related are emerging. Diseases that hit the villages are also of various kinds, for example a pest plague that attacked the wet and dry fields in Tae; every year the plague continues to grow.
8. Diseases of livestock and agriculture continue to threaten; every year in every village it is more difficult for villagers to raise livestock because they are often exposed to pestilence.

Seven Fortunes of the Dayak

The Dayak Indigenous peoples' ways in adapting to and mitigating climate change and damage rest in their local wisdom that reflects their deep relationship and interaction with nature. The Dayak's general view of nature (Forest Motherland) is inseparable from the various forms of culture and wisdom that have generally preserved and maintained the forests and natural resources of Kalimantan and Borneo sustainably and continuously for millennia. Dayak culture is the result of the interaction of Indigenous peoples (Dayak) with Nature and the Creator which then keeps Nature sustainable so that it continues to give life, revive and dignify in a sustainable manner. For this reason, nature is the center of livelihood and culture for the Dayak Indigenous peoples.

In simple terms, nature for the Dayak is (1) the Center of Life and Livelihood, which is shown by how nature has become a source of food needs, medical materials, household needs, economic needs or livelihoods and community sustainability. (2) Nature is the Center of Identity and Socio-Culture; this right is shown by all traditional rituals that always connect humans with nature and their Creator, various sacred customs and spiritual life (customary religion), which also depend on and source from nature. Through nature which is managed in a subsistent way, a culture of mutual cooperation/solidarity is born, as well as traditions and customs in the entire cycle of life, cultivation and treatment. Nature is also the center of inheritance of local knowledge, determining status, existence and the sovereignty and dignity of its people. 3) Nature as the center of Sustainability (future), where nature if maintained and sustainable will be able to ensure life, welfare and even become one of the main factors in self-determination, internal recognition and formal legality.

The harmonious interaction of Indigenous peoples with nature and the Creator produces wisdom and good values that become the guidelines and principles in managing and maintaining nature, which John Bamba⁹ calls the seven fortunes of the Dayak or the seven fortunes of life. These Seven Fortunes of the Dayak are:

1. Diversity and Sustainability

For the Dayak people, the management of economic resources, such as forests, is a social, economic and cultural activity that is equally important. Agricultural activities, for example, in addition to meeting human physical needs, should also meet social, cultural and spiritual needs. Therefore, farming involves various customary ceremonies (rituals). Rice is planted, to be processed and cooked into rice and eaten in order to stay alive. But planting rice is also done in order to celebrate the return of "rice" to the world. Thus, rice and "paddy" are equally important to be planted in the fields. Likewise, various kinds of vegetables, fruits and even flowers planted in the fields have spiritual meanings. It is for this reason why rice fields, for example, are less developed among the Dayak in Kalimantan. Because rice fields lose their "rice" element.

In the Dayak community, monocultural farming systems are not known. There are no fruit gardens that contain only durian or only rambutan. It is on the basis of this philosophy that natural rubber originating from Brazil can be accepted without the slightest rejection. Not because it is easy to plant, but because natural rubber can thrive together with other plants. The main victim of this multicultural spirituality is productivity, so it is not surprising that the community forest

system developed by the Dayak communities is considered unproductive. For the sake of sustainability and preservation, Indigenous peoples prefer to sacrifice short-term productivity.

2. Cooperation and togetherness

The universe for the Dayak is a common home for humans, animals, plants and invisible creatures. In terms of ownership, nature is managed together although individual rights are also given a place. Animals and plants help humans by providing natural clues while humans give places to animals and plants in accordance with prevailing customs. Invisible creatures are also given the right to live by maintaining sacred places and avoiding cultivating land that, based on instructions from nature, has been used as a habitat for other creatures. In the implementation of community forest system management, for example, this philosophy of togetherness is also manifested in the activities of cultivating fields, which are carried out by people together and by turns without applying a wage mechanism.

3. Organic and Natural

Dayak people believe that nature has its own power and mechanism to renew itself, if nature is managed according to its supporting capacity. Therefore, humans need to avoid excessive intervention in nature, which is carried out in destructive ways and means. In contrast to fatalism, this philosophy of the Dayak is rooted in the belief that nature has prerequisites for its sustainability. Therefore, the Dayaks are not familiar with the use of various chemicals as fertilizer or pest poison. The fertilizers used are natural (organic) such as ash from burned soil; plant pests are overcome by renewing relationships with other natural elements through various rituals. This method will indeed slow down humans in achieving and developing various intellectual achievements, technological engineering and economic benefits but guarantees the sustainable preservation of nature and a more humane life. The use of chemical fertilizers, for example, while able to increase productivity causes various pollutions detrimental to health.

4. Rituals and Spirituality

Sacred places are the most central places in the spiritual life of the Dayak people. They are generally located in the forest that become an integral part of a forest area, the *labenstraum* or the world of life of Indigenous peoples' communities. For this reason, forests often function as "places of worship" because in customary religion there are no special buildings (houses) for worship. Because of this, forest management is full of elements of spirituality which are manifested in the performance of various forms of customary ceremonies (rituals). The process, for example, in selecting the location for fields is made based on rational and spiritual considerations at the same time. The location is chosen based on strategic practical considerations (location, quality, season), social (according to custom), cultural (tradition) and spiritual (based on natural guidance).

5. Process and Effectiveness

For Dayak people, good results need to be achieved through good ways as well. In forest management activities, the goal to be achieved is not merely economic but is a life process that shows the unity between humans and nature. In other words, forests are not only for fulfilling human exploitative goals, nor are they solely for ecological purposes. Managing forests is an obligation that must be carried out by humans as a form of responsibility to the Creator. As the most intelligent creatures, humans must take up the leading role and at the same time are the most responsible for the preservation of nature. Therefore, humans need to manage forests fairly and sustainably, not to be greedy and manipulative. The forest management ethics is manifested in various customary rules and rituals that are carried out. In the perspective of global productivity, forest management activities carried out by the Dayak are seen as inefficient (wasting time, effort, cost) and unproductive; in this perspective, what matters is economic interest, while the ecological, social and cultural impacts are the price that must be paid in order to obtain economic benefits.

6. Domestic and subsistence

Unlike the capital economy which is run in order to serve the needs of the market, the economy of the Dayak peoples relies on subsistence to serve their own needs. In a capitalist economic system, product commercialism is a prerequisite for being able to compete in the market. This has the consequence of continuously improving product quality, attracting attention and in large numbers to dominate the market. This of course also has implications for the innovations made. In order to win the competition, an economy that serves the needs of the market maximizes the innovations carried out, including through the scientific engineering process which has implications for the use of engineering facilities and infrastructure, such as certain chemicals. For example, comparing on one hand broiler (breeds) chickens given food and chemical injections and sometimes whose legs and beaks are even cut to gain weight quickly, and on the other domestic chickens raised naturally, everyone admits that the quality of the latter is much more secure and its consumption healthier.

7. Customary Law and Locality

Customary laws are local rules: originating from local communities they respond to local needs and aim to regulate them locally. In relation to forest resource management, customary law is structured more to ensure the preservation of nature and all its contents for the benefit of the community itself. The customary law generally regulates ownership (individual, collective and group), allotment (forest use) as well as aspects related to how interactions between humans and forest areas are regulated. Therefore, customary law that regulates forest management is free from intervention by outside parties, including the interests of local and regional entrepreneurs.

These principles of natural resource management are commonly found in all the study areas of this NBS research. The principles, called the seven Dayak fortunes, are the main basis for the Dayak to manage nature and are also solutions to reduce the impacts of climate change and damage, especially those that occur as a result of deforestation and forest destruction. Born from

the culture of Indigenous peoples, these principles are sound and wise in maintaining the preservation and sustainability of nature and life, so that customary territories and forests have been preserved for thousands of years.

However, it is undeniable that this nature-based local wisdom and knowledge also continue to erode with the changing times and proliferation of exploitative and destructive land-based industrialization, which is counter-productive to the Dayaks' principles in managing their natural resources. For example, the principle of diversity is contrary to the principle of industry, which is monoculture/monocrop and wide-scale. The principle of subsistence is contrary to the principle of industry, which wants to dominate as much as possible, being capital-oriented. The principle of cooperation is contrary to the principle of industry, which is comparative, individual and competitive.

Referring to these principles, the research team found several practices of the study communities in preventing natural damage, and these principles can be found as a whole process which shows that the Dayaks have contributed to overcoming natural destruction by managing, caring for and preserving nature in a sustainable manner. The Dayak Jalai and Kendawangan in Ketapang District practice natural ways of dealing with various climate damage through *Belakau Behumaq* (shifting cultivation) and *Berdahas Bedakar* (creating *pedukuhan*, alternative business management centers that are integrated with farming processes, because around *dahas*/fields there are always farms and rubber plantations). These two traditional forms of natural resource management include sustaining the availability of forests, local medicines, carrying out rituals, providing rice and side dishes and vegetables (food), including having a kind of natural and customary "certificate" that certifies the area is inhabited, managed and very productive. Farming and cultivation can address economic issues because the products of vegetable gardens, forest and rubber-tapping can be sold to the market. In addition to meeting life's necessities, this practice also addresses food problems and prevents the destruction of forests and the surrounding nature.

Likewise, in Dayak Tae similar local practices are *Beumek* (cultivating dry-rice fields and wet-rice fields), *Bekebun Janah* (gardening in areas near *tembawang* and former fields) and managing and making *Mawakng* (*tembawang*, i.e. maintaining and planting areas that are starting to lose their forest plants with fruits and medicinal plants). *Tembawang* are generally old forests that were former settlements or at least once lived that have many fruit and medicinal plants. The Dayak Sisang in Kampong Segumon and its surroundings have similar wisdom called *Bumeh* (cultivating hills), *Tawang* (wet-rice field farming), *Mawa* or *Mawang* (cultivating *tembawang*) and *Bekebotn* (local gardening), raising livestock, and maintaining *tembawang* in a place called *Pelaman* (it resembles *dahas* but is not always close to forests). This practice is also found in the Dayak Iban Sebaruk where the people conduct *Buma Betaun* (cultivating/farming), gardening, *pelaman*, and *Temawai* (*tembawang*).

COVID-19 PANDEMIC

COVID-19, a global outbreak and pandemic, is one of the biggest problems for the world today. The worldwide confirmed COVID-19 cases as of 5 June 2021 numbered 173,333,748, with a recovery rate of 156,328,791 and 3,727,824 deaths. For Indonesia, as reported by *mediaindonesia.com*, positive cases reached 1,843,612 people, 1,697,543 people recovered and 51,296 died.¹⁰ The deadly coronavirus forced the world to pause, with the Government issuing various unusual policies because the death toll continued to rise, such as Large-Scale Social Restrictions (PSSB), self-quarantine, and complying with the World Health Organization's call for physical distancing, wearing masks, washing of hands, and conducting vaccinations since the end of 2020. Social restrictions only apply to regions that need and meet the requirements and are approved by the central government. West Kalimantan in particular had been designated starting early April 2020 as a health emergency area, so schools were closed, entry and exit of people were tightened, some offices were on work from home arrangements, and airports closed. The government's efforts are quite effective in suppressing the rate of COVID-19 in West Kalimantan.

For Indigenous peoples, the problem of COVID-19 is a new challenge that exacerbates their situation of oppression and marginalization. Before COVID, they were already experiencing economic problems, deprivation of rights, deforestation, criminalization and food insecurity. One of the causes is the prohibition against farming by burning, resulting in the criminalization of farmers who are accused of causing haze, but no alternative solution is offered. Another economic problem is the continuing decline of local commodity prices for almost 10 years, such as rubber prices which have remained at Rp. 7,000/kg and during the pandemic even decreased to Rp. 4,000/kg. At the same time, prices of basic commodities have continued to rise, such as sugar which jumped from IDR 10,000/kg to IDR 25,000 per kg and rice from IDR 10,000/kg to IDR 20,000/kg. As a result, in difficult situations, many people choose to sell their land and become casual laborers at companies in order to make a living. COVID-19 has worsened the situation of Indigenous peoples.

Even though facing difficulties due to COVID-19 is a big challenge, Indigenous peoples do not make it worse, and on the contrary show how local wisdom and community culture can save humans and their civilization. From March to April 2020, according to data compiled by Institut Dayakologi, more than 100 customary rituals of '*Tolak Bala*'¹¹ were carried out by indigenous communities separately in their respective customary areas. This wisdom has been implemented long before the government issued a lockdown or self-quarantine policy. The Indigenous people of Kampong Segumon, for example, performed the *Malis* customary ritual on March 21, 2020, and the Iban Sebaruk, the *Bepentik* custom in the middle of March.¹² Then the Jalai community carried out the *Meengaria Benuaq* or *Besiang Benuaq* ritual to protect the village.

The traditional ritual of *Tolak Bala* is local wisdom that has been revived after many indigenous communities abandoned it as it was considered irrational, ancient and backward. But now it is a solution to COVID-19. This customary ritual requires the community to close their settlements and villages and is reinforced with customary law. Community residents generally do self-quarantine for 3-7 days in each village, thus also lessening the number of people around the community. Residents further abstain from certain foods, which are actually closely related to maintaining

immunity. In addition, they mix and blend medicines from nature for immunity, such as medicinal leaves and wood roots from the forest, honey, turmeric and ginger. The indigenous communities facilitated by Institut Dayakologi in Sanggau and Ketapang generally follow various government advice, including not gathering and working together in big groups for a while. They spend their time managing gardens and fields and maintaining forests and tree trunks as well as productive businesses. Communities remain in the forest and dahas or fields after the village self-quarantine period; they believe that the Spirit of Nature protects them.

The pandemic also places great importance on solidarity and helping each other, especially for people who are sick or underprivileged. For Indigenous peoples, solidarity and cooperation are the main characteristics and values of daily life and are a lesson for other groups who are starting to abandon togetherness. The following are some of the Dayaks' specific responses, including the women and children, to COVID-19.

1. Socio-Culture and Local Knowledge

In terms of local knowledge and socio-culture, the Dayak community's response to COVID-19 using the traditional ritual of '*Tolak Bala*' had been in practice long before the government-style lockdown or quarantine imposed to stem the pandemic. The communities had guarded their customary territory and community with the ritual of '*Tolak Bala*'/getting rid of bad luck to expel evil influences, diseases, pestilence and viruses that entered their villages. The term *Tolak Bala* is different for each community. In Jalai and Kendawangan it is better known as '*Besiang Continentq*' or *Meengaria Benuaq*; in the Sisang and Bi Somu communities, *Malis* custom; and in Iban Sebaruk, '*Tolak Bala* and *Bepentik*'.

An accompanying response was strengthening the body's immune system. The local communities prepared special ingredients from their respective customary forests to consume to increase the body's immunity, with the village healers determining the needed leaves and tree roots. They also carried out self-quarantine for an average of 3-7 days in each village, especially areas facilitated by Institut Dayakologi. Socio-culturally, the Dayaks also followed the government's call for preventing the spread of the COVID-19 outbreak by not carrying out social activities or community activities that involve the public. However, some conditions have started to affect the routine rituals that should be carried out every year. Among these is the ritual of the new rice customary harvest festival which is always carried out before farming the following year. This situation was circumvented by conducting independent rituals for each house without involving many people, but there were many communities that delayed or did not conduct these traditional rituals.

2. Food Security

Community residents who farm generally have fairly good food security because they have fields to cultivate and harvest from. For example, in Kampung Silat Hulu, 47 out of 75 families

have rice stocks to eat for more than one year, except for residents who no longer farm because they work for companies or no longer own land (22 families). Community members who have no fields or whose crops have failed to meet their needs are starting to face difficulty because rice in stores costs Rp. 15,000-20,000/kg and people's sources of income have also started to decline. They also do minimum cultivation because of a government ban that considers community cultivation as the cause of haze. Those who do farming remain vulnerable to criminalization, which could lead to a serious food problem in the future. Most of the lands of Indigenous peoples have also been controlled by companies whose economic investments and profits are not distributed fairly among the community.

3. Health

Community members try to protect themselves from COVID-19 by self-quarantine and by increasing immunity with herbs/food from nature. Government assistance is still slow due to the lack of health facilities and medical personnel. Although there is so far no information on confirmed COVID-19 cases in the study areas, access to rapid tests for COVID-19 in the community, especially for vulnerable groups such as the sick and over 60 years of age, is also very limited, as such tests are dominantly for urban communities and those located close to health services. While the community obeys government's general measures for preventing COVID-19, most of them also have to work in the fields, become laborers and tap rubber trees because they have to survive.

COVID-19 vaccination services still do not reach the Indigenous peoples in these facilitated communities at all due to limited information and categorization group limits issued by the government. Even in urban areas, not all people have been fully covered by the vaccination services, with the achievement of stage 1 vaccination at only 9.2% or 17 million of the targeted 181 million. In addition, residents have to pay on their own antigen and PCR (Polymerase Chain Reaction) swabs, which cost from Rp 200,000-300,000 and Rp 1,000,000-2,000,000 respectively, with the results being known only after 1-2 weeks. This does not apply to those who are infected by COVID-19 who are assisted by the government for their medical treatment.

4. Economy

One of the problems that emerged as a result of COVID-19 is that people's incomes began to decline due to very low commodity prices such as those of rubber and pepper. Rubber prices for example dropped from Rp 8,000 to 5,000 and pepper price from Rp 20,000 to 15,000. Many of the Indigenous people who became laborers were also laid off by their companies. Natural resources are also starting to become less productive because of the increasingly narrowing area. As a result, some community members started selling lands to companies. Those who work or depend on the company for their livelihood are even more vulnerable to COVID-19 infection be-

cause the company continues to operate as usual and employees' work load does not decrease, which raises the risk of COVID-19 infection. This happened in Ketapang District in April 2021 when a new cluster of infections occurred, consisting of a number of employees of companies, including those in Manismata, Air Upas and Marau Sub-Districts.¹³

5. Politics and Law

Government assistance to address the impacts of COVID-19 is of a very charitable form, for example providing rice assistance and temporary and limited subsidies for electricity. This assistance is pragmatic but not systemic. The government continues to deregulate employment and investment (Omnibus Law) which give companies leeway to not comply with Environmental SOPs and increase their investment period over customary areas. Assistance for food security, protection of customary rights and lands and maintaining local commodity prices are far more urgent than this assistance.

Indigenous peoples' areas that have received government recognition, for example in Segumon, Tae, Lubuk Sabuk and Iban Sebaruk, all in Sanggau District, have also received no special attention from the government. In March, a resident of Tapang Peluntan Village, Iban Sebaruk was found guilty by a court for having farmed and he was also accused of causing land fires in the company's concession area. In addition, during the COVID-19 period, the recognition process for Indigenous Territories in Ketapang District, especially in Silat Hulu and Batu Menang, as well as verification of customary forests in Sisang and Iban Sebaruk Customary Administrations remained stagnant on the ground these could not proceed due to the pandemic and budget refocusing.

6. Impacts on Indigenous Women

The Dayaks' problems and challenges due to the COVID-19 pandemic have exacerbated their main problems, including being vulnerable to losing their rights and customary lands due to lack of knowledge and helplessness to deal with their economic difficulties. During this period, several community members began to relinquish their rights to companies, including in the Iban Sebaruk area, such as Kampong Perimpah. Outsiders were also taking advantage of those who were self-quarantining, for example in Kampong Sungai Sepan (Iban Sebaruk area) by cutting and logging in their customary forests. The same thing happened in the Tae Customary Administration Area, and in Silat Hulu mining companies continue to displace and appropriate customary lands for exploitation.

While the Indigenous peoples in general are being exploited by palm oil and logging company investors, a similar situation is happening among the Indigenous women. Those in Sanggau and Ketapang are exploited by companies operating in customary areas that force them to work as laborers during the COVID-19 period. If they do not work, they are not paid their wages and thus have no income. This is the case of Indigenous women in Kampongs of Tanjung, Pangkalan Pakit,

Tembiruhan and Batu Menang in Ketapang who work as casual laborers at PT. Cargil, PT. Pangyono, Sampoerna and BGA (Bumitama Gunajaya Agro). It is the same case in Sanggau, particularly in Kampogn Segumon, Guna Baner, Sungai Tekam, Sungai Sepan, Malenggang, Lubuk Sabuk and Noyan, where PT. BGA, PT. SISU (along Inti Surya Utama), PT. MKS (Mitra Karya Sentosa) and Gudang Garam are also operating. Indigenous women continue to work based on the time set by the companies, which is 3 days a week, with no reduction in workload and working time.

Housewives also experienced their own challenges with the learning system from home and school during the COVID-19 pandemic, because oftentimes school assignments were beyond their abilities, with their generally low education, limited smartphones and poor signals. They were not used to taking care of the children who suddenly had to study at home, and the demands of school which varied were beyond their capacity. In terms of health, women especially those who work as laborers are very vulnerable because of direct contact with outside parties. They are also responsible for taking care of all family members including those who may be old and sensitive or suffer from certain diseases. In addition, mothers also work in the forest or in the garden to collect vegetables for their daily food and drink.

Meeting economic needs are also getting tougher. Women generally manage and control household affairs and daily needs, and given the decreasing income things get even worse because their children's school fees have to be paid, prices for basic commodities continue to soar and household needs remain the same and need to be met. In addition, for the non-laborers, women and children spend more of their time in the fields and dahas or their productive business gardens. Even though they do not have direct contact with other people, they are forced to go outside which they think is safer, such as experienced by women in Kampong Tanjung in Ketapang and Kampong Segumon in Sanggau. The pandemic situation that restricts outings and gatherings has also exacerbated the already limited space under normal conditions in which Indigenous women can move.

In the response to COVID-19, especially in the conducting of customary rituals and processing of immunity-boosting medicines from nature, Indigenous women are the main actors. In the villages, it was housewives who mostly played the role of preparing materials and facilities for customary rituals such as 'tolak bala'. In Kampong Segumon, the one who acted as the indigenous healer/elder as well as the local expert was one of the local women named (late) *Ibu Jangin*. Indigenous women also actively collect herbs or medicines from nature to boost their immune system, for example in Guna Baner, Segumon, Tae, Tanjung and Silat Hulu. In Silat Hulu, Indigenous women produce natural herbal drinks from ginger, eat *sengkubak* leaves (a type of spice and flavoring leaf), drink fresh water from small rivers in the customary forest.

7. Education and Children

To address the COVID-19 pandemic, the Government ordered schools to close until June (2021) and has been implementing a learning system from home, online and through television (TVRI/government television). The learning from home system is only possible for urban children or those with good access to electricity and internet. Children in indigenous communities experi-

ence difficulties or miss lessons online or via TV due to lack of electricity, internet access and cell-phones as well as assistance from their teachers. Some children in the villages also go with their parents to the forest, dahas and fields.

LOCAL KNOWLEDGE AND PRACTICES AS RESPONSE TO COVID-19 AND CLIMATE DESTRUCTION

Dayak Tae

The social, cultural and economic lives of the Dayak Tae (as well as of the Dayak Iban Sebaruk and Sisang) in Sanggau District have close links to the forests, lands, waters or nature in their customary territories. Hundreds of years of experience interacting with nature from generation to generation have shaped a lifestyle that places nature as part of the solution for their daily lives. The close relationship between natural elements and the life of the Tae people can be found strikingly in the religious system and traditions inherited from the Tae ancestors through religious-spiritual practices in customary rituals. Various materials from nature and the surrounding environment are also used in activities beyond customary rituals.

Customary rituals as mitigation against COVID-19

One of the customary rituals of the Tae community is the *Nguser Amot Sampar, Be Tamba Kampokng*. This ritual is led by two *Tukang Paca* (indigenous healer), namely *Pet Tanjal* (50) and *Pet Ate* (60). The aim is to ask for protection from *Jibata Pejaji Penampa* (God Who Makes and Creates) so that residential areas and all the residents as well as the world are free from *Amot Sampar* (Pestilence Ghost), from coronavirus outbreak (COVID-19) and all diseases. The ritual was carried out in April 2020 when the impact of the COVID-19 pandemic was increasingly experienced by the whole world.

The '*rimah adat*' or customary materials needed for this religious-spiritual ritual comes from nature in the Tae customary area. This includes: 1) tengkawang fruit oil, 2) *Layakng* leaves, 3) lime stone paste, 4) coconut leaves, 5) dry-field rice, 6) glutinous rice from dry-field, 7) clean water to make fresh water, and 8) 14 '*rancak*' made from bamboo blades, *Layakng* leaves, a special thread made from *bu'* bark.

This customary ritual is carried out at the sacred sites of *Pedagi Guna Keramat Puaka* and *Pedagi Ria Sinir* as well as *Tanjung Bunga* area.



The People of Tae, both men and women, work together to prepare a 'rimah adat'/customary materials for Nguser Amot Sampar, Be Tamba Kampokng customary ritual. (Photo credit: Siba/ID Documentation Team)

This ritual imposes taboos (*tabu/taboo*: anthropological term) or customary prohibitions for all residents in the Tae customary area, the period of abstinence lasting 7 days. Some of the taboos are 1) working outside the home (work in dry-rice and wet-rice fields); 2) *Ngelayu*, *Ngelala* or collecting and gathering forest products and killing animals that bleed; 3) eating the following foods: '*panca nayo*, *imukng*, *nails*, *vinegar*, *kuyat*, *unakng*, *ketep*, *kijakng*, *njagokng*, *ngkoyokng* and *dodok* or bamboo shoots, ferns, *melinjo* leaves / *Gnetum gnemon* Linn., mushrooms, shrimp, crabs, *kijang*/*Muntiacus muntjak*, deer, river fish and snake head fish; 4) visiting or entering the kampongs in the Tae customary territory.



Tengkawang oil is ready to be wrapped in *layakng* leaves for the customary materials for each customary ritual in the Tae Dayak community.



Young Tengkawang fruit with petals (Photo credit: Siba/ID's Documentation Team)

Significance of Tengkawang

Tengkawang oil is the main ingredient or '*rimah inti*' for Dayak Tae customary rituals. The religious-spiritual meanings of tengkawang oil in Dayak Tae customary rituals, according to *M. Yopos* (45, resource person for this research) are as follows: 1) the natural and pure fragrance of tengkawang oil (*panca nayo*) is a form of offering to *Jibata* (the God) and its natural aroma is also favored by ancestral spirits; 2) "*Lico licin*" - its shiny, slippery oil symbolizes smoothing, serving as a fast smoothing medium for *Jibata* and the good spirits mentioned earlier; 3) as a customary material, it also represents all the plants growing in the *Pengarakng mangokng*, *kompokng keloboh*, and *mawak kelako* throughout the Tae customary area.

This religious-spiritual significance of tengkawang oil in the Dayak Tae customary ritual is the main and essential reason for the Tae people in preserving the tengkawang trees in their customary territory.



Tengkawang tree estimated to be more than 100 years behind
Kampong Tae

The oil of tengkawang fruit, *Layakng* leaves, local rice, local glutinous rice, lime stone, bamboo, *rancak* are also customary ingredients or '*rimah adat*' for the *ganjor* customary ritual. These natural ingredients complement one another and have the same important role in the Dayak Tae customary rituals.



Layakng leaves can only be obtained from the Tae customary forest. Rice wrapping material in family events as well as for customary rituals. Helpful and practical, this leaf replaces the function of plates made of pottery or glass.



Rice wrapper made from *Layakng* leaves; after the *Layakng* leaves are cleaned, they are ready to be used to wrap rice with.

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Rice wrapper made from *Layakng* leaves; after the *Layakng* leaves are cleaned, they are ready to be used to wrap rice with

Customary rituals to heal the sick

The Tae people use materials from nature in their customary area for customary rituals to heal the sick. Those in Kampong Mak Ijing, for example, use bamboo for *tumpakng rancak*, *uwak Batak* consisting of 7 betel nuts, 7 pieces of betel leaf, *Layakng* leaves to wrap rice and salt, and

nipah leaf cigarettes. These ritual materials are accompanied by the sacrifice of a rooster and a dog, which completes the 'offering' of the executor of the customary ritual through the other materials that have been prepared.

For example, the healing ritual '*Be Bayei*' held at kampong Mak Ijing led by *Tukang Paca* (indigenous healer), namely *Pet Sawah* with *Pet Dedeng* as his assistant or '*sebayu*,' was to atone for a resident's guilt for having burned down a fig tree while he burned his field last year. It is believed the tree became angry and caused the person to become ill.

NBS in customary rituals to mark farming calendar

The Dayak Tae use a stick of *Mbali* or *Mbuat* wood for the customary ritual material of *matatn banih*. This ritual is a traditional way to symbolize the start of the rice planting period in the dry-rice fields and wet-rice fields. Based on their customs and traditions, it must be carried out before the rice planting activity begins.

The purpose of the *matatn banih* customary ritual is to accompany and/or deliver rice seeds as well as to provide rice supplies in a customary way in order that they grow well to produce a large harvest. Rice is personified as something that is alive, has a spirit, and is even life itself. That is why in rice culture, planting rice is a customary obligation for continuing life itself.

The implementation of the customary ritual of *matatn banih* must take into account the time of auspicious days and months. After it is carried out, rice planting activities can begin in the same month or time, usually done jointly or with a rolling or '*pengari*' work system. This culture of cooperation or reciprocity or cooperativeness is an important social asset in the Dayak Tae farming system.

The '*rimah adat*' or customary ritual materials obtained from nature in this ritual include a small stick of *Mbali* or *Mbuat* wood, '*bontokng puyut*' which is rice from glutinous rice wrapped in *Layakng* leaves, '*bontokng kalekng*' which is rice made of plain rice and salt wrapped in *Layakng* leaves, tobacco, raw chicken eggs, *sentek* containing lime stone, and a single *nipah* cigarette, rice wine, '*langga*' or *wijan*/sesame. A piece of '*Mbali* or *Mbuat*' wood is plugged into a plot of land, then chanted with mantras or prayed for.



In rice culture, the Dayak Tae consider aspects of customs that are full of religious/spiritual values. When farming, they pay attention not only to the harmony of relations with their fellow residents but also their relationship with nature and their creator/God (*Jibata Pejaji*). Therefore, Dayak Tae people are united both in the context of working and/or farming activities and of carrying out their customary rituals related to farming traditions.

Roles of ‘Naul’ (eagle) and ‘Buwak’ (owl) in food security

One of the embodiments of a strategy based on culture and nature (cultural and natural) is to share the risk of crop failure. Concretely dividing the risk of being attacked/plagued by pests, such as rats, sparrows, insects and leafhoppers, the Dayak Tae strongly believe in food webs that contribute to the safety and balance of the surrounding ecosystem.

For example, ‘*naul*’ or eagles and owls can reduce pests that damage rice in both the dry-rice and wet-rice fields. In addition to floods and long dry seasons, extreme weather changes often increase the threat of pest attacks on rice in the farms and in the wet-rice fields. ‘*Naul*’ and owls have the ability to adapt to these extreme weather changes. Eagles and owls eat mice, insects and leafhoppers, and in addition for eagles, sparrows. The Dayak Tae know and believe in this natural phenomenon.

Neither owls nor eagles are hunted by the Dayak Tae. This allows the process of the food web to continue. As long as dry-paddy fields or wet-paddy fields still grow upright or are not damaged by floods, then owls and eagles continue to contribute to reducing the risk of crop failure in the Dayak Tae community.

The relationship of influence between the natural role of the eagle and the owl and the religio-spiritual practices embodied in the customary ritual of ‘*nginong pade*,’ however, cannot be separated. This customary ritual also uses materials obtained from the forest in the Tae customary area. The following is a brief description.

Natural materials in ‘Nginong Pade’ customary ritual

The customary ritual of ‘*nginong pade*’ is literally interpreted as a ritual to treat sick rice or rice that is plagued by pests. This is a customary way to have the spirit of rice restored and/or returned and merged with the stems of rice. The rice spirit or the ‘core force’ of the rice life is considered to have left the trunk due to the disturbance of various pests.

This customary ritual is carried out in a location or field. The customary materials that must be prepared consist of: 1) a rooster, 2) a stick of bamboo processed into a fish trap that will function as a ‘*jangka*’ or container for ritual materials, 3) two small bamboo sticks, each filled with water and rice wine called ‘*sulekng*’, 4) *siakng*, *sentek*, *bontokng sosor*, *epekng nasi mawikng* (all wrapped in ‘*layakng*’ leaves, 5) glutinous rice, white rice, yellow glutinous rice, regular yellow rice, chicken eggs, nine sticks of sticky rice cooked in bamboo called ‘*lemang*’, basil flower, *tampukng tawar*, *rebanyu*’, sweet potato, banana, salt, two split bamboo blades called ‘*ngkubakng*’, *uwai batak*, ‘*ajoh paleh*’ (two small bamboo sticks), red *tumpik* (traditional cake made from sticky rice flour), white *tumpik*, one packet of *Lawang* rice.

The dense forest in the Tae customary area stores all the customary materials or '*rimah adat*'. If the materials are insufficient or incomplete, the customary ritual cannot be carried out.

After the '*nginong pade*' customary ritual, all residents living in the customary area of Kete-menggungan/customary administration of Tae are required to undergo a period of abstinence for 3 days, including going to the fields.

Dayak Sisang

Kampung Segumon was once known as a fruit kampung because it used to have a lot of fruit trees, most of which were durian trees. Its economy relied on two main commodities, pepper and rubber. Today Kampung Segumon is surrounded by oil palm trees.¹⁴ The monoculture plantation belongs to a private company and is located on the border between Indonesia and Sarawak, East Malaysia. Information from *Apai Dogim*, a *Prabu* or Indigenous Elder of Kampung Segumon, shows a significant spatial change at least in the last ten years.

Selling durian fruits from abundant harvests to increase their income and to buy kitchen necessities has become the story of the past. The situation in Segumon's customary territory has changed. Some of the forest has been cleared and replaced with monoculture plantations. This condition causes the air temperature throughout the customary area to be hotter compared to when the kampung still had extensive and dense forests. The remaining forest still seems to have to be added with various types of local trees. The Dayak Sisang who are the largest group in Kampung Segumon must be able to maintain the remaining forest. An area of 651 hectares of the Tembawang Tampun Juah customary forest in the kampung has been legally recognized by a Government decree.

It is in the customary forest that the Dayak Sisang carry out their fruit customary ritual. When the fruit season starts or when the fruit flowers have started to grow into ovules, the entire population hold a customary ritual of '*Metek Suat Bua'k* or *Enselan*.' The ritual materials that must be prepared include 1 chicken per household, 1 Leng/portion of local rice per household, rice wine made from fermented glutinous rice (1 bottle per household), 3 eggs, *Lemang* or glutinous rice cooked in reeds (1 stick per household). All these customary materials are prepared and placed in a '*tempara*', a kind of small table made of bamboo. The '*tempara*' filled with all the ingredients is placed under the durian tree to be 'pomanged' or prayed for.

The purpose of the '*enselan*' is for all the ovules to thrive and succeed to produce abundant fruits. This customary ritual has a special prohibition or abstinence obligation for all residents of the kampung where it is carried out. The duration of abstinence is 2 days. In addition to the prohibition from working in the fields or entering the forest and taking produce and hunting, the residents are also prohibited from leaving the kampung.

After the end of the fruit season, another customary ritual called '*Metat Kebag Bua*'/*Encelan*' is then carried out. The customary materials needed are the same as those in the ritual mentioned earlier. This ritual aims to drive away all kinds of diseases or all fruit ghosts so that they will not disturb humans. In this ritual, Sisang people feed the fruit ghosts until the latter return to where they are from and not disturb the safety and health of the residents of the kampung.

Nowadays, because the number of fruit trees has decreased significantly, the customary fruit rituals are rarely carried out anymore. However, during the COVID-19 pandemic, the Sisang Indigenous community in kampung Segumon carried out the '*Malis*' Customary Ritual.

In the '*malis*' customary ritual, the '*pomang*' elder conveyed her prayers for all residents of Kampung Segumon to be protected and saved from the COVID-19 outbreak. The '*malis*' customary ritual led by a female '*master pomang*,' namely *Jangin*, was carried out on March 21, 2020 to close the kampung and at the same time beg for the pestilence and COVID-19 to disappear and stay away from the Indigenous peoples in the '*malis*' customary area.



The customary materials used included chicken, rice wine, limestone, betel, *Sabang* Leaves, tobacco, *kini balu* bamboo, and *Empago*. Except for chickens and tobacco, all these customary materials were taken from the Tembawang Tampun Juah customary forest.

After following the customary ritual, all residents of Kampung Segumon underwent a period of abstinence for 2 days. During the period of abstinence, all residents were prohibited from leaving the kampung and vice versa, and outsiders were also banned from entering Kampung Segumon area.

As part of their local initiatives, the Tampun Juah Community also brought out the *MAKLUMAT ENSANGI / ENSANGI ADVISORY ANNOUNCEMENT 2020* document on July 18, 2020. The document was an initiative based on local wisdom that was produced jointly after the implementation of customary rituals. According to the Temenggung/customary leader of Sisang, *Ageus Laimudin*, this announcement was made in the context of preventing and overcoming the COVID-19 pandemic in the Tampun Juah Community area. "The Ensangi announcement 2020 is based on the

common awareness of the Tampun Juah Community about the importance of residents' safety amid demands for compliance with health protocols, especially since the era of *new normal* is enforced," said Pak Laimudin.

Dayak Iban Sebaruk

The Dayak Iban Sebaruk similarly cannot be separated from their interactions with nature (the physical environment) and the supernatural realm, namely the spirits of their ancestors. This is a characteristic of their religious and spiritual life. When the fruit season arrives, the Iban Sebaruk welcome it by communicating with their ancestors' spirits. They carry out the customary '*Mentik*' ritual in the '*temawai*' or tembawang forest. The goal is to convey prayers to the creator and the spirits of their ancestors to 'guard' the growth of various fruits in the '*temawai*' or customary forest so that the fruits will survive and succeed in growing until ripe or ready to be harvested directly from the tree. The customary ritual is carried out so that all types of *Kerbam* disease (fruit disease) will not hurt humans, and it is also believed that all types of fruit that carry flowers can become good fruits and bear fruits.

The customary ingredients for this ritual are chicken, rice wine, flour, sticky rice, *letup*, *pansuh pulut* (glutinous/sticky rice cooked in bamboo tube), *pentik*, *kumpang* wood, *serang* wood, *banking* wood, *ui segak*, and *temiang*. In addition to chicken, all the complementary materials for the customary ritual come from the forest in the Ketemanggungan/Customary Administration of Iban Sebaruk Tanah Kedieh's customary area. The location for performing this customary 'fruit' ritual is at '*Sandung* or *Guna*'. The '*pentiks*' are then planted or erected at the ends of each kampong.

The Iban Sebaruk are also vulnerable to the COVID-19 pandemic. This is because some of their residential areas are directly adjacent to Sarawak, and several points of location for "rat" roads (illegal roads) there provide opportunities for people to enter and leave the Iban Sebaruk area. These "rat" routes are often used by illegal migrant worker dealers. The Iban Sebaruk in Kampong Guna Banir, a kampong directly adjacent to Sarawak, responded to the COVID-19 pandemic with the customary ritual of '*Bepentik*' whose goal is that *Petara* or the Creator always protects Indigenous peoples and all residents from all kinds of diseases, including COVID-19. The customary materials/offerings needed to conduct the *Bepentik* ritual are 1 pig, at least 1 chicken per household, 2 bottles of rice wine, 10 pieces of sticky rice, flour, *Pansuh* sticky rice, *Letup*, *Kumpang* wood, *Serang* wood, Lily wood, *Ui Segak*, *Timang*. In the implementation of this customary ritual, the kampong community was required to abstain for one day, prohibited from leaving their kampong and from going to the forest. It is believed that through this customary ritual, the kampong community could be protected from the COVID-19 virus.

Dayak Jalai

The Dayak Jalai with their local Dayak knowledge have generally known various deadly diseases and viruses since time immemorial. In Kampong Tanjung, for example, they call infectious and deadly disease as pestilence. Some types of pestilence are high fever, *gerumut* (high fever with red skin, like an itchy disease), *kilung* (body is filled with a kind of scabies) and *jangap* (kind of chicken pestilence). According to *Abrosius Jamil* (79), an indigenous leader, *balin* (Dayak healer) and former *Damong Adat* (Customary elder), the Dayak Jalai in the past had experienced several kinds of pestilence, including a type of deadly high fever that killed every day 2-3 people per kampong. Due to the large number of victims who died, the villagers were no longer able to bury them properly and instead just put the bodies in a *lancang* (coffin) or wrapped in a mat leaning on a wooden tree.

Then another disease appeared, which was a kind of *gerumut* followed by hot fever that caused death if the infected person took a bath. This epidemic also claimed many lives, with the death rate at 2-3 people per kampong on a daily basis. During this pestilence, the community decided to leave their kampong and moved to new ones, such as *Dahas Sungai Kemuyang*, *Tanggiran*, *Kayu Batu*, *Sungai Tanang*, *Hansir*, *Binjai*, *Kusik Sapar*, *Karangan Naik*, *Sembakah* and *Tanjung Lelayang*. This became one of the historical factors for Dahas being always occupied in groups by several local family heads, because residents fled their kampong in groups. The outbreak then disappeared after the Jalai Dayak carried out various customary rituals and used kampong remedies. After the outbreak, several important figures of the Dayak Jalai emerged, namely *Upui Jemiriq* and *Gemalaq Kemisiq*.

When the *Kilung* disease appeared, the medicine used was the *rengas* bark, which was boiled, mixed with other natural ingredients then used for bathing and read with customary prayers; in this way the people overcame *Kilung* disease. However, if it had not been through customary prayers or adequate ingredients, the disease could have actually worsened. "I myself was exposed to this *kilung* disease but managed to recover after having taken a hot bath with a number of other ingredients and given a customary prayer/mantra; without such process, taking a bath with the *rengas* water could worsen the disease," explained Jamil.

During the pestilence *jangap*, the people carried out *Beniat* customary rituals requesting *Duwa-taq* (the God) and Forest, Land, Water, then conducted the *besesilih* (custom rituals and praying together to expel evil spirits) for one whole *binuaq* (big village) including the residents who lived in Dahas also gathered at the time. All customary offerings were delivered to all corners of the kampong, until they reached more than 30 pieces of *ancaq* (a place to store offerings made of woven bamboo). After the customary ceremony was done, the community was prohibited from visiting one other and had to stay in their respective homes for 7 days, a kind of local quarantine (lockdown). The roads were fitted with *pancung temiang* (a type of small bamboo) with *sanak* (material for making *ambinans*/traditional baskets) to prevent residents from passing through. After 7 days, the abstinence was then lifted with a customary ritual, but the ritual of *beniat*/request was not carried out and would only be performed after 3 months. It was the last custom that was held with *rincungan temiang*, because since then there has never been a major epidemic. During the enforcement of the abstinence, the people did not leave their houses and were not

even allowed to collect vegetables and other foods. Food stuff had to be prepared/stocked up before the customary ritual was carried out.

Based on this historical experience, the Dayak Jalai also carried out the same customary rituals, the *Besesilih Benuaq* and the cleaning of the kampong when facing the COVID-19 pandemic. Before performing the customary rituals, it had been agreed that for the next 3 or 7 days no activities outside the house would be allowed. The tools prepared for the ritual were *tentambaq tuhaq* (rice wine), *tampung tawar* (a kind of yellow rice), rice, *rukuk kerapit* (as a symbol of offering friendship to the forest, lands and waters to help and assist the people) and *pendehupaan*/incense. This ritual, which involved all *Damungs*/customary elders and shamans, required huge resource, although its implementation did not take much time. Complementary materials for the ritual included chicken and pork, *tambulnya* (additional means for the main customary items), namely rice and glutinous rice, *ancaqejalaq*, *lumpang panjang bayar hutang*.

Other types of pestilence experienced by the Jalai Dayak were *Baruk Mehuap*, abdominal pain, shortness of breath. The Jalai Dayak overcame the disease outbreak with their local wisdom, namely by performing *bekaul beniat* and no other way was conducted. The signs of impending pestilence are unpredictable and can only be seen when someone has already been infected. But outbreaks such as coughs and colds come usually marked by the appearance of fruit flowers such as durian, *Pekawai*, *Kusik*, among others. Even if no plague occurs when the fruit flowers grow, it will appear when the fruit season is almost over.

In dealing with COVID-19, the Jalai Dayak are not too worried because they have experience dealing with various deadly pestilences before and believe that *Duwataq* and nature will provide a solution. "This COVID doesn't scare me at all, because I believe and surrender to *Duwataq*. I'm sure I've made friends with all the guardians of the earth and they will provide an antidote. Like we believe in God. If we believe in *Duwataq* and be friends with the universe, they will take care of us and provide a way out," said Jamil.

Representing the Dayak Jalai Indigenous woman, *Wiwin* (34) who is also a medical officer of Kampong Tanjung, provided a similar explanation. According to her, a customary ritual called *Reject Balaq* has been held to reject all forms of misfortune and illness. The people involved in this ritual were indigenous leaders, shamans, kampong officials and the community; AMA-JK and CU GK were also invited as well as the youth in the hope of a cultural regeneration taking place. This ritual is important because COVID-19 is like a pestilence, and pestilence does not only attack humans but also animals.

In the context of meeting food needs and responding to climate change, the Jalai Dayak follow a cycle of cultivation. In their tradition, customary rituals must be carried out to greet the year, but due to COVID-19, these are only conducted in a limited manner and within the family. To maintain food security, apart from planting rice in the fields, residents also plant sweet potatoes and cassava, because if the harvest fails or the yield is insufficient, they can rely on these foods. "We also grow local vegetables. After the harvest season is over, we will plant perennials/hard wood crops such as local fruits and we will also make dahas for us to live in, so even though we cut down trees to make fields, our forest will not be deforested," said Wiwin.

Dayak Kendawangan

Just like the Dayak Jalai, the Dayak Kendawangan in Silat Hulu, Ketapang District have also been affected by the COVID-19 pandemic. The Silat Hulu community first heard about COVID-19 around March-April 2020 through television and social media. Taking into account the extraordinary impacts that were starting to be felt in the kampong, children, for example, could not have face to face classes, lockdowns proliferated and external relations were increasingly limited. Thus, it was for the sake of maintaining the safety of all residents that the Silat Hulu indigenous elders held customary rituals according to their tradition in dealing with pestilence. According to Japin (48), the Temanggung Adat/Customary Elder of Silat Hulu, they used inherited local knowledge in dealing with this deadly infectious disease.

In ancient times, when a pestilence disease plagued the village and many fell victims, the villagers usually fled or moved further into the forests and built a hamlet (forerunner of dahas). This situation is often the beginning of the history of the formation of new settlements and villages. The people generally left per household and were not allowed to bring livestock because it was believed to easily catch or carry diseases. They also abstained from eating certain plants and animals. This method then was still possible as the area was still large and people could easily find new locations for settlement. But when this method was no longer relevant, village/kampong healers or local experts usually conducted the *Betanung*, which is to hold customary prayer chanting in customary sacred places and ask for guidance from the ancestors and *Duataq*, the Creator.

Following *Betanung*, the village elders agreed to carry out a customary ritual to drive away the pestilence according to their tradition by performing the *Ancak Basar*. This is a traditional ritual of offering food to spirits, both good and evil, in which evil spirits after being fed were requested to leave people's kampongs and return to their original places. After performing the *Beniat* and *Ancak Basar* rituals, the village was then closed and residents were not allowed to leave the village for three days nor to have visitors from outside the village. After about a week, residents had another dream that their intention had to be carried out in a larger capacity by praying for the previous intention. The residents next performed the customary ritual of *Betetabus Basar*, then abstained and closed their village again for another 3 days. Silat Hulu residents continued to perform the *Beniat Besar* customary rituals several times continuously from April 2020 to February 2021, starting from the end of the kampong, the customary sacred places, on the river, in the forest and the middle of the kampong.

According to the Silat Hulu Indigenous Women group, *Nur* (43), the head of the Silat Hulu Hamlet, said in addition to traditional rituals, the residents prevented the impact of COVID-19 by implementing several other practices and measures, including:

Ensuring all dry-rice fields are cared for and harvested. As a result, residents of Silat Hulu in 2020 saw abundant harvests, from the usual average of 13,200 kgs per year produced by 41 families to the previous year's harvest of 26,400 kgs. However, the situation was difficult for those who do not farm because they do not have land or work for companies.

Maintaining good health with natural foods: drinking local honey they themselves harvested in Silat Hulu mixed with red ginger every night. In 2020, Silat Hulu received the blessing of God and Nature with a bountiful harvest of honey, which reached 80 jerry cans (1,600 kgs) from the usual

average of only around 5-10 jerry cans (100 liters) per year. Honey bees feed and make honey on various woods, such as *Pula*, *kampas*, *durian* and *stone* wood, and even in unusual places in the forest. Housewives also did *bekasai* or smearing their bodies with ginger every night, eating vegetables, drinking *tuak*/rice wine every night in moderate quantities and drinking fresh water in the forest and from small rivers.

With these measures, the Silat community (as of July 2021,) has been one of the safest villages free from COVID-19 without the people needing to buy vitamins and fully entrusting their lives to their local wisdom and nature.

INSTITUT DAYAKOLOGI'S ROLE AND INTERVENTION IN REDUCING COVID-19 RISK

Food is the main source that is beneficial to health and increases stamina. The mobility restrictions imposed as part of the health protocols to prevent COVID-19 transmission have limited food fulfillment of residents.

In response, the Pancur Kasih Empowerment Movement (GPPK) through the Institut Dayakologi applied a natural and cultural approach in collaboration with multi-stakeholders in Sanggau District, in particular in the Tiong Kandang Community and Tampun Juah Community. Institut Dayakologi, together with the Village Government and the Tae Ketemenggungan/customary administrations as well as the Sub-District Government, Balai Batang Tarang Health Center and Balai Batang Tarang Police, mobilized trainings to improve skills in making '*pitn rampah angkat*,' traditional mixed herbal drinks made from natural ingredients sourced from the community for the family's consumption.

All Tae residents in 8 kampongs were divided into 15 groups, with each group directly receiving training (coaching) from special officers of the health authority of the Balai Batang Tarang Sub-district government. Traditional drinks were made from natural spices including ginger, turmeric, lemongrass and palm sugar. Traditional drinks with natural ingredients are used for increasing body stamina, including reducing the risk from viruses that attack the body's immune system. After being processed and while still warm, the traditional drink is immediately consumed and within a few minutes the body temperature rises to the point of sweating. The whole group agreed to make traditional drinks for the consumption of their family members. It was a grass-roots-based health movement, as the family is the smallest social unit, the foundation for social life at the village level.

In addition, ID gave the Dayak Tae, Iban Sebaruk and Sisang communities personal protective equipment including masks, thermo guns (temperature gauges), disinfectant liquid, disinfectant sprayers, and liquid soap for washing hands. The COVID-19 task force guard post procured three units of materials each for the Tiong Kandang and Tampun Juah communities. To facilitate communication and dissemination of COVID-19 health advisories, ID distributed videos of health protocols in local languages to all Dayak Tae, Bi Somu, and Iban Sebaruk residents.

In 2020 to reduce the spread of COVID-19 and mitigate its impact in the Tampun Juah Community, ID helped facilitate the implementation of health protocols. Public outreach to comply with the health protocols was carried out through the Tampun Juah Community Radio that broadcast in three Dayak languages - Iban Sebaruk, Sisang and Bi Somu. This helped prevent the spread of the coronavirus, at least in the three areas of the indigenous communities. Institut Dayakologi also provided health care equipment such as hand sanitizers, masks, water storage barrels in Tiong Kandang Community and Tampun Juah Community. In addition, ID also facilitated training in making “*pitn rampah ngat*” and in preparing organic fertilizers to support resilience and development of local food cultivation.

RELEVANCE AND ACHIEVEMENT OF SDGS

Before the emergence of a sustainable development agenda or Sustainable Development Goals 2015-2030, which replaces the Millennium Development Goals, Institut Dayakologi together with the Pancur Kasih Empowerment Movement had started in the early 1990s the practice of sustainable development by applying the concept of holistic empowerment based on local wisdom. This is the practice of holistic empowerment among the Dayak Indigenous peoples, including in Ketapang and Sanggau Districts, who still depend on forests and natural resources for their livelihoods but have little access to these and who are facing structural injustice and poverty. It has five fundamental principles that balance the economic, social, and environmental dimensions: 1) People (humans), 2) Planet (earth), 3) Prosperity, 4) Peace and 5) Partnership (cooperation). These five principles are known as the 5 Ps and cover 17 Goals and 169 Targets that are connected and integrated, and cannot be separated, in order to achieve a better human life.

The SDGs also have three main pillars, namely social, economy and environment, which are complemented by the governance pillar. Thematically, the SDGs are divided into at least 17 major goals called sustainable development goals, namely:¹⁵

1. End poverty in all its forms everywhere
2. Eliminate hunger, achieve food security and good nutrition, and promote sustainable agriculture
3. Ensure a healthy life and improve the welfare of the entire population of all ages
4. Ensure inclusive and equitable quality education and increase lifelong learning opportunities for all
5. Achieve gender equality and empower women
6. Ensure the availability and sustainable management of clean water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote inclusive and sustainable economic growth, productive and comprehensive employment opportunities, and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industries, and encourage

innovation

10. Reduce intra- and inter-country disparities
11. Make cities and settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable production and consumption patterns
13. Take swift action to address climate change and its impacts
14. Conserve and sustainably utilize marine and oceanic resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, manage forests sustainably, stop desertification, restore land degradation, and stop biodiversity loss
16. Strengthen inclusive and peaceful societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Taking into account the various nature-based solutions carried out by the Jalai, Kendawangan, Tae, Sisang and Iban Sebaruk Indigenous peoples, several conclusions can be drawn from the participation and contribution of the Dayak peoples towards achieving various SDGs:

1. No Poverty

One of the important experiences and lessons learned by Indigenous peoples in implementing nature-based solutions is being able to overcome the economic and social difficulties caused by climate change and the COVID-19 pandemic. The Indigenous peoples in the Customary Administrations of Dayak Sisang, Tae, Jalai and Kendawangan Indigenous Communities, for example, are able to meet the daily needs from farm and forest products. The essential point is that as long as they have customary territory, customary forest and are still actively farming, poverty can be minimized. Natural products based on their natural resource management that is rooted in local wisdom such as *dahas*, *pelaman* and *tembawang* help them fulfill their needs in housing, food and alternative income.

In addition, cooperation and social solidarity in the villages or kampongs have directly contributed to overcoming the conditions of poverty and hunger in every community. Among the Dayak Kendawangan in Kampong Silat Hulu, for example, if there are residents who are old and can no longer farm or who are sick, those who farm work hand in hand to help by setting aside produce from their fields to be distributed to them. Thus, natural management practices that are in accordance with local wisdom, in addition to preserving nature, also strengthen the spirit of social solidarity that contributes directly to overcoming the problem of poverty. In addition, residents who manage nature also get abundant natural products such as fruits and vegetables and sell these to markets around the community, thus contributing to their alternative income.

2. Zero Hunger and Food Security

Similar to overcoming poverty, through natural management based on local wisdom and supported by customary areas and forests, residents can meet their food needs from na-

ture without being dependent on other people or outside parties. For example, in Ketemenggungan Sisang at Kampong Segumon and in Dayak Kendawangan Community in Ketapang, the harvest from the previous year's cultivation was still sufficient for this year's consumption needs, meaning that one farm can meet food needs for 2 years.

3. Good Health and Well-being

For this 3rd goal, the nature-based solutions carried out by indigenous communities are very clear, such as the many local materials found in their respective customary areas and forests. For example, forest honey, ginger, bamboo shoots, pepper, natural fruits, leaves and a number of tree roots are useful forest products that are used to increase the body's immune system and maintain health. That none of the indigenous community members was exposed to COVID-19 because they consumed a lot of local herbs was one indicator of their healthy life. With a healthy and fit condition, residents are thus able to work to fulfill their needs and realize their own welfare.

4. Quality Education

The management of natural resources in accordance with local wisdom, including processing of natural products and making business centers with Dahas, Tembawang and Pelaman models involving children and youth, is a very effective means of natural and cultural education. The young see directly how parents work with nature wisely and sustainably, showing that nature-based education is part of high-quality education.

5. Gender Equality

In various activities of managing and safeguarding nature, the roles of women and men are generally quite balanced; women do light work and men do heavy work. For example, while slashing fields is generally done by both women and men, men are more dominant in cutting activities, and in sowing women sow and men make the holes using a stick (*menugal*). When making herbal potions, men climb the tree to get a beehive (*memuar*) and women mix the complementary ingredients. Some of these practices demonstrate the existence of gender balance and equality.

6. Clean Water and Sanitation

The Dayak Community in Ketemenggungan of Tae takes care of the Tiong Kandang hill so that the forest remains intact and produces abundant reserves of clean water that flows down from this hill into every villager's house. Thus, the management and care of nature contribute significantly to providing clean water in a self-determined manner.

7. Affordable and Clean Energy

Nature in the form of water, forest, land and air provides a number of sources of energy or resources that can be accessed freely and regularly through various rules and customary laws that apply in indigenous communities. This is found in all the communities where this research was conducted. Because the areas are controlled by the local Indigenous peoples, their access to them is easy to fulfill.

8. Decent Work and Economic Growth

The pandemic situation and climate change that indigenous communities were able to address through nature-based solutions also increased a variety of new jobs. For example, due to the pandemic, most of the sick went to village healers, such as in Kampong Segumon, Tae and Guna Baner villages where those who received treatment increased to 100%, because the medicine is effective and the village healer is the solution. This situation increases the work for village healers as well as the sale of village herbs, vegetables and fruits, helping to raise employment and local economic growth. This development contributes to this 8th goal.

9. Industry, innovation and infrastructure

For this 9th goal, not much was found other than a few innovations and changes during the pandemic. For example, the number of people living in *dahas* or *pelaman* increased to avoid crowds, and indigenous ritual activities became more focused and harvest festivals (*gawai*) were limited to residents of each village. In each village, small huts are also found not far from the village where telecommunication signal is strong for virtual learning for the children.

10. Reduced Inequalities

For this 10th goal, indigenous communities, which are far from government attention in getting COVID-19-related assistance as well as access to other developments, are trying to be self-determined in overcoming various COVID-19 problems and in solidarity with helping people who are sick. Likewise, overcoming food shortages by farming is part of local and self-determined efforts to reduce inequality.

11. Responsible Consumption and Production

This 12th goal can be seen in the pattern and way of life of Indigenous peoples as they engage in subsistence agriculture, meaning they only take natural resources to meet their daily needs, not to accumulate wealth, let alone greed.

13. Addressing Climate Change and its Impacts

Nature-based solutions for climate change and the COVID-19 pandemic contribute to reducing the impact of climate change. In particular, the Indigenous peoples' natural resource management system in accordance with local wisdom in the form of *dahas*, *pelaman* and *tembawang* is a concrete example of how they manage and safeguard nature in a sustainable manner. This practice has significantly contributed to overcoming the impacts of climate damage.

15. Protecting, restoring and improving the use of sustainable land ecosystem

As in the 13th goal, a natural resource management system according to sustainable local wisdom contributes to achieving the 15th goal.

16. Realizing justice and resilient institutions

Nature-based solutions managed by Indigenous peoples contribute to realizing justice with the existence of customary laws and social ethics that live in communities that have kept nature intact and made it possible to address various challenges of climate change

and pandemics. The challenging conditions that come and go also make indigenous communities more solid and realize the importance of the existence of forests and nature so as to make customary institutions more resilient. Thus, nature-based solutions also maintain justice and strong institutions.

Thus, this research concludes that the Dayaks' nature-based solutions in addressing climate change and the pandemic have contributed to at least 14 of the 17 Sustainable Development Goals.

CONCLUSION

The culture and local wisdom of the Dayak is one of the inheritances of nature-based science and knowledge to sustain and benefit life and the world, as this research has shown. The existence of natural resources and customary territories that are safeguarded, managed and maintained according to local wisdom is the key to solutions, especially in relation to climate change and COVID-19, with the power of nature created by God.

The following are some conclusions drawn from this NBS research.

1. The Dayak peoples have made a real contribution in overcoming and reducing the impacts of climate change, including the COVID-19 pandemic, through their practices and values of fair, subsistent and sustainable natural resource management by prioritizing the principles of survival, self-determination, progress and prosperity in togetherness. Some of these values include diversity and sustainability, cooperation and collectivity, organicness and naturality, ritual and spiritual, process and effectiveness, domestic and subsistence, as well as customary law and locality.

Knowledge of the value of all cultural practices in managing natural resources in the customary area is called *the Seven Benefits of Dayak*. With this value, several forms of practices as solutions to reduce climate problems include *berdahas* or planting, caring for and maintaining a forest area specifically and in groups that have a variety of plants to meet the needs of life and medicine as well as a place for farming and productive business/alternative income generating centers such as raising livestock, tapping rubber trees and gardening vegetables. Apart from *dahas*, other practices are *pelaman* and *tembawang* (similar to *dahas*) as identified in the Dayak Iban Sebaruk and Sisang, and also *kabon janah*, *nangot* and *mawakng* (similar to *dahas*) identified in Dayak Tae. The communities also maintain the flow of rivers and forests for food reserves in the form of food for side dishes and vegetables that can be consumed at any time.

On the pandemic challenge, the indigenous communities applied local lockdowns or village/kampong abstinence after carrying out traditional rituals (*tolak bala* or driving away bad luck) in which the community people collected various forest products for food for 3-7 days and after that not a single resident went out to the forest, garden or market because they had to comply with the abstinence, and food reserves were sufficient for the needs of several days.

In addition, residents also collected a number of forest herbs to increase body immunity. For residents who were symptomatic, various village treatments were also carried out, including *betagas* (i.e. inhalation of hot water vapor from the decoction of medicinal herbs from the forest). With these practices, it can be concluded that the Dayak and their nature-based wisdom are a concrete solution in maintaining the sustainability of life on this earth, especially in overcoming the impacts of climate change and the Covid-19 pandemic.

2. The sustainability of nature-based solutions is only possible if customary areas and natural resources are maintained, managed and safeguarded by consistently applying the values and principles of local wisdom. If the function of forests, land and natural resources in customary areas has changed or even disappeared altogether, then a nature-based solution would be very difficult because the impacts of industrialization and corporations are some of the causes of natural destruction, climate damage and various other life and environmental problems. Damaged nature is a very serious disaster for the environment, climate, life, livelihoods, local wisdom and culture. For this reason, if nature is not maintained or continues to be destroyed, then nature-based solutions are very unlikely to sustain because they no longer have adequate carrying capacity.
3. The Indonesian government, both at central and local levels, has started to implement Nationally Determined Contributions and Nature-based Solutions, but the implementation has not been maximized because of the absence of concrete policies to implement NBS in an effective manner. For example, while the government is committed to reducing emissions by maintaining and planting forests, it also continues to open up investment opportunities in the destruction of natural resources through mining and oil palm plantations. The forests that are highlighted by the government are conservation forests and national parks to which Indigenous peoples do not have access.

On the other hand, the government also does not implement the palm oil moratorium effectively, as evidenced by the fact that many companies continue to expand and cut down forests illegally and out of hand. For a pandemic measure, the government only provides charitable assistance but does not support local resources that strengthen community survival. For example, it has only been providing direct assistance in the form of cash, which is only temporary.

However, several government policies have also been integrated for nature-based solutions by respecting the rights of Indigenous peoples, for example Article 18(b) of the 1945 Constitution, protection of cultivation (Law No. No. 35, 2012), and a number of Regional Regulations on the Recognition and Protection of Indigenous Peoples in West Kalimantan.

4. Nature-based solutions are a form of local wisdom that has been applied by Indigenous peoples for generations. This solution should not only be measured by the ability to overcome climate change and the number of emissions reduced but also by the number of areas and forests/nature that can be saved, because nature-based solutions will only exist if nature exists. Thus nature-based solutions for now must be more prioritized to provide solutions to save nature itself.

RECOMMENDATIONS

Taking into account the abovesited conclusions and a number of challenges in the application and practice of nature-based solutions by Indigenous peoples, the following recommendations are made:

1. Promote and strengthen the internalization of nature-based solutions by all stakeholders, including the government, civil society organizations and the Indigenous peoples themselves through advocacy, education, training and various documentation.
2. Document, publish and promote all positive practices and values of nature-based local wisdom in overcoming various global problems such as climate change and the COVID-19 pandemic.
3. Encourage and facilitate several areas where possible to apply NBS as a model and reference for NBS.
4. Strengthen advocacy for the recognition, revitalization and rescue of indigenous territories and community-based natural resources as the center of NBS, identity, livelihood and sustainability of Indigenous peoples, the world and all life on this earth.
5. Prepare and involve local men and women actors, adults and indigenous youth to participate in various discussions on NBS at local, national and international levels.
6. Facilitate collaboration and synergize important elements of NBS, namely Indigenous peoples and their natural resources (customary territories), CSOs or community facilitating institutions, the government and policies that favor Indigenous peoples and NBS.
7. Encourage cessation of criminalization against Indigenous peoples, destruction or exploitation of forests and natural resources in general, and resolve various forest, land and environmental related conflicts.

Endnotes

- 1 Source, Total Forest Area of Indonesia: <https://lokadata.beritagar.id/chart/preview/luas-hutan-di-indonesia-1482633530>.
- 2 On Kalimantan Forest: <https://www.profauna.net/id/kampanye-hutan/hutan-kalimantan/tentang-hutan-kalimantan#.Xq1l3RMzZQI>.
- 3 Data source, Walhi Kalbar and PPSDAK Pancur Kasih (2019).
- 4 Poverty Profile of West Kalimantan Province, September 2018, based on BPS-West Kalimantan Data in Figures, 2019.
- 5 PPSDAK in a period of 24 years (1994-2018) facilitated participatory mapping of customary territories in 446 villages spread across 46 Sub-districts in 10 districts, with an area of customary territory reaching 1,737,245.42 hectares or 11.83%.
- 6 Data from the Central Statistics Agency (BPS) Sanggau District, 2017.
- 7 Directorate General of Climate Change Control (2017). NDC (Nationally Determined Contribution) Implementation Strategy Book, Ministry of Environment and Forestry.
- 8 WWF presented the impacts of deforestation and climate change in its report entitled Assessing the Impact of Climate Change in Borneo, as reported from: <https://www.mongabay.co.id/2012/06/15/climate-change-and-deforestation-in-borneo-fatal-impact/>.
- 9 John Bamba is a Dayakologist, Founder of Institut Dayakologi and Chair of the Pancur Kasih Empowerment Movement (GPPK).
- 10 <https://mediaindonesia.com/weekend/409662/nuansa-hijau-hak-asasi-manusia>.
- 11 General term for the Dayak Indigenous peoples' customary rituals to ward off disease, pestilence and evil spirits that encroach the village or customary territory with simultaneous prayer to God to protect the whole world from the threat of plague and destruction.
- 12 Institut Dayakologi's Field Team Report and Indigenous Peoples News in Kalimantan Review Magazine: <https://kalimantanreview.com/tangkal-korona-enter-kampung-dan-mewide-society-adat-community-tampun-juah-di-ketemenggungan-sisang-kampung-segumon-gelar-ritual-adat-malis/>.
- 13 The article by Hendra Cipta was published on Kompas.com, <https://regional.kompas.com/read/2021/04/11/134817378/muncul-klaster-karyawan-usaha-satgas-covid-19-ketapang-diminta>.
- 14 Interview with Apai Dogim (81), permitted to be quoted.
- 15 Indonesian Sustainable Development Goals, UNPAD, 2018.

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