From Dialogue to Protocol: Participatory Approaches to Biocultural Governance in Maya Q'eqchi' Agricultural Cooperatives in Guatemala

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Abstract

This paper documents the collaborative development of biocultural protocols (BPs) with ten Maya Q'eqchi' agricultural cooperatives in Alta Verapaz, northern Guatemala, highlighting the methodological, ethical, and political dimensions of co-designing community-defined governance tools. Framed by Indigenous rights frameworks such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the principle of Free, Prior, and Informed Consent (FPIC), the protocols articulate locally grounded norms and claims over land, traditional knowledge, and benefit-sharing. Drawing on participatory and decolonial methodologies, the process engaged both non-Indigenous and Maya Q'eqchi' researchers in a reflexive dialogue, navigating challenges related to language, internal diversity, and institutional scepticism. The paper contributes to ongoing debates on ethical research and Indigenous sovereignty by providing a framework to assess the process of development of biocultural protocols and demonstrating how they not only support community governance and articulate collective rights, but also serve as living expressions of cultural values, relational accountability, and territorial care. The concluding reflection interrogates what it means to co-create protocols without co-opting voice, arguing for a deeper commitment to epistemic plurality, trust, and community ownership in environmental governance and research partnerships.

Keywords

Biocultural protocols; Agricultural Cooperatives; Maya Q'eqchi'; Free, Prior, and Informed Consent (FPIC); Guatemala; Biodiversity Conservation

Key Policy Highlights

- Biocultural protocols co-developed with Maya Q'eqchi' cooperatives demonstrate how Indigenous communities can articulate governance norms rooted in their cultural values and territorial rights.
- Recognising biocultural protocols as legitimate tools under UNDRIP and FPIC strengthens Indigenous Peoples' sovereignty over land, knowledge, and benefit-sharing.
- Intercultural, participatory approaches build trust and ensure that governance tools reflect community-defined priorities without co-opting Indigenous voices.
- Ethical research and policy must turn epistemic and legal plurality into practice to truly uphold Indigenous Peoples' right to self-determination.

Declarations

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government. This study was approved by the Natural Resources Institute's research representatives and was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki, including obtaining freely given informed consent from all participants.

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1. Introduction

In recent years, biocultural protocols (BPs) have emerged as important tools for Indigenous and local communities to articulate their collective rights, protect traditional knowledge, and set the terms of engagement with external actors, including researchers, NGOs, and companies (Cooke et al., 2022; Girard et al., 2022; Halewood et al. 2021). Rooted in the principles of self-determination, customary governance, and stewardship of biodiversity, BPs offer a community-defined framework for navigating the often-unequal terrain of environmental governance, benefit-sharing, and knowledge exchange (York, 2025). As mechanisms recognised under instruments such as the Convention on Biological Diversity (CBD) and the Nagoya Protocol, BPs seek to operationalise the right to free, prior, and informed consent (FPIC) and to support Indigenous Peoples in asserting control over how their biocultural resources and traditional knowledge are accessed, used, or represented (Halewood et al. 2021; Rakotondrabe and Girard 2021).

The academic literature has acknowledged the potential contribution of BPs to protecting traditional knowledge, advancing community rights, and fostering more equitable, respectful engagement between Indigenous Peoples and external actors. However, it also cautions that BPs must be developed and implemented in ways that genuinely reflect and reinforce communities' biocultural values and pay due attention to power and politics (York, 2025), rather than simply serve regulatory compliance or economic interests. In addition, design of effective biocultural protocols for diverse communities is constrained by insufficient integration methods, lack of standardised guidance, inconsistent legal recognition, gaps in ensuring inclusivity and adaptability, resource limitations, and minimal impact evaluation (Rakotondrabe and Girard 2021).

Theoretical framework: biocultural diversity

Traditionally, nature conservation has been pursued separately from aspects of cultural heritage and diversity. However, over recent decades, a thriving literature has established a clear nexus between cultural diversity and biological diversity, shifting the focus of conservation to protecting the relationships between people and nature (Bridgewater and Rotherham, 2019). Key concepts (such as biocultural assets, biocultural ethics, biocultural heritage, biocultural landscapes, and biocultural knowledge) have been explored to frame "biocultural diversity" within frameworks grounded in social–ecological systems theory, integrated conservation and development, and community-based conservation (Díaz-Reviriego et al., 2024; Franco, 2022). In parallel, the use of the concept of "biocultural" has also grown in policy spheres, from the World Heritage Convention embracing the concept of 'Cultural Landscape' as part of its operational guidelines (UNESCO, 1972) and built upon by international platforms such as UNESCO (UNESCO, 2008) and IPBES (IPBES, 2019; IPBES, 2024).

Inherent in the concept of biocultural diversity, are the rights and responsibilities of Indigenous Peoples. As integral parts of ecosystems, with reciprocal responsibilities and relationships to other species and the environment, Indigenous Peoples and their knowledge systems, culture, and stewardship are essential for sustaining both biological and cultural diversity (Berkes, 2004). The literature points to biocultural heritage as constituted by various elements, such as "ecosystem memories," landscape and place-based memories, and stewardship, highlighting the role of Indigenous communities in biocultural conservation (Lindholm & Ekblom, 2019). Cultural keystone species (CKS) are one promising pathway by which biocultural approaches to conservation might be implemented in practice. However, further investment in policies and programs that support enabling mechanisms for Indigenous Peoples to maintain, manage, and restore relationships with CKS is required (Lukawiecki et al., 2024).

A prominent example of such mechanisms that has been promoted for improved capacity, local governance and rights recognition in biocultural conservation is biocultural (community) protocols (BPs). These are protocols developed after a community undertakes a consultative process to outline their core ecological, cultural and spiritual values and customary laws. These processes have been often supported by NGOs or researchers but controlled by community themselves. The processes have included participatory mapping, community visioning, and negotiation of rules, to ensure that local knowledge and priorities shape conservation outcomes (Halewood et al., 2021; Natural Justice, 2009; Parks, 2018). BPs aim to serve as locally developed governance tools, providing clear terms and conditions to regulate access to their knowledge and resources and operationalising international agreements (e.g., Nagoya Protocol) at the local level (Foyer et al., 2024; Halewood et al., 2021; Rakotondrabe and Girard, 2021).

While BPs may act as tools for protecting traditional knowledge and rights, their effectiveness may be limited by technical, cultural, legal, political and economic challenges. Many BPs risk becoming primarily technical tools for access and benefit-sharing, neglecting the holistic biocultural context and traditional knowledge (TK) they are meant to protect. This can result in TK being treated as a commodity rather than as an integrated part of community life, customs, and territory (Nemoga et al., 2022). In addition, national governments and international actors may not fully recognise Indigenous Peoples' jurisdiction, rights, or worldviews, and agreements with communities often lack international enforcement. This limits the practical impact of BPs and can leave communities vulnerable to misappropriation or exploitation (Srinivas, 2012). Addressing these limitations requires greater emphasis on holistic and community-driven approaches and stronger attention to power dynamics.

While promoted internationally, actual numbers of formalized BCPs remain modest, particularly in Indigenous communities: e.g., a protocol for seed governance in Peru (Swiderska & Argumedo, 2022), a few in Panama's Indigenous territories (Foyer et al., 2024), pilot protocols in Madagascar (Rakotondabre et al., 2021), a protocol by traditional health practitioners in South Africa (Sibuye et al., 2012), protocols produced by Comcáac Peoples in Mexico (PNUD, SEMARNAT, RITA, Comisión Técnica Comunitaria de Comcáac 2018) and a small set of farmer BPs in Benin/Madagascar (Halewood et al., 2021). Authors consistently portray current practice as pilot, proof-of-concept, or pioneering, with significant scope for wider uptake, methodological refinement, and critical reflection (Foyer et al., 2024; Girard et al., 2022; Halewood et al., 2021; Nemoga et al., 2022; Rakotondabre et al., 2021). They also emphasise the need to pay greater attention to power relations and context-specific dynamics in bridging diverse knowledge systems (Burke et al., 2023; York, 2025). This paper aims to contribute to the development of BPs by: (i) proposing approaches to knowledge co-production that support Indigenous Peoples' self-determination; (ii) centring biocultural realities, customary law and place-based worldviews as integral foundations of BPs; and (iii) evidencing concerns about co-optation or use of BPs as top-down planning tools. By documenting and assessing the development and implementation of a process to create BPs, we aim to help in the identification of elements for guidelines and best practices that may lead to more just and effective BPs, based on actual practical efforts.

Guatemala: a megadiverse country

Guatemala is recognised as one of the most biologically rich and ecologically diverse countries in the world. Despite its relatively small geographic area, it is considered a megadiverse country, harbouring a disproportionately high number of endemic and threatened species (Mittermeier et al., 1997; CONAP 2011). Its dramatic altitudinal variation from sea level to over 4,000 meters, creates a mosaic of ecosystems ranging from lowland tropical rainforests and mangroves to high-altitude cloud forests, pine-oak woodlands, and paramo-like grasslands (WWF 2020). These varied environments support an estimated 14,000 species of flora, with roughly 10% endemic, and more than 1,400 species of vertebrates, including rare amphibians, jaguars, Baird's tapirs, and hundreds of migratory birds (IARNA-URL and CONAP 2010).

Guatemala contains seven major ecoregions and over 300 microclimates, contributing to its ecological complexity (CONAP 2011). The Maya Biosphere Reserve, located in the northern department of Petén, is the largest contiguous forest in Mesoamerica and a critical corridor for biodiversity in the Selva Maya (Carrillo et al. 2014). In the central highlands and cloud forest regions of Alta Verapaz, ecosystems host numerous endangered and culturally significant species, such as the resplendent quetzal (Pharomachrus mocinno), a flagship species and national symbol (Eisermann and Avendaño 2007). These biodiverse landscapes often overlap with Indigenous territories, where Q'eqchi', K'iche', and other Maya peoples have maintained traditional agroforestry, spiritual practices, and land stewardship that contribute to ecological resilience (Toledo and Barrera-Bassols 2008).

Despite this richness, Guatemala faces high rates of deforestation, land degradation, and biodiversity loss due to extractive industries, agricultural expansion, and climate change (FAO 2020). Forest loss in the past two decades has been particularly severe in regions with weak governance and overlapping territorial claims, many of which are inhabited by Indigenous communities (Bray 2020). As such, Guatemala exemplifies the dual condition of biocultural richness and ecological vulnerability that characterizes many megadiverse nations in the Global South. Nevertheless, community-based conservation models, such as Indigenous forest concessions in the Petén and agroecological cooperatives in the Verapaces, demonstrate viable approaches to biodiversity protection rooted in cultural knowledge and local autonomy (Barry and Meinzen-Dick 2014; Ellis et al. 2017). Against this backdrop, the co-design of biocultural protocols represents a strategic effort to build tools that have the potential to affirm community values, protect local knowledge systems, and redefine the terms of collaboration in agroecological and research contexts.

This paper documents the participatory design process of the first biocultural protocols of Guatemala, undertaken with Maya Q'eqchi'-led agricultural cooperatives in Alta Verapaz. It explores the practical, ethical, and epistemological dimensions of creating these protocols in intercultural spaces marked by asymmetries of language and power, which can arise between communities and external brokers, within communities themselves, and through the discourses and knowledge systems that shape what BPs can say and do. This paper contributes to the growing literature on BPs by offering a grounded, process-based account of how protocols can be co-designed in ways that genuinely reflect and reinforce Indigenous Peoples' biocultural values, rather than serving primarily regulatory or market-oriented ends. While scholars have rightly cautioned against the instrumentalisation of BPs as tools of external compliance or benefit-sharing frameworks detached from community realities (Burke et al. 2022), there remains limited empirical research documenting how these protocols are actually developed in context, particularly within agroecological settings. In export-inserted agroecological communities, protocols can help leverage biocultural heritage by reinforcing seed conservation, on-farm diversity, and community governance (Gómez, 2025; Osterhoudt et al., 2020), but only if designed as inclusive and locally-led processes that explicitly confront potential tensions between globalized commercialization and short-term profit pressures and biocultural diversity and local food sovereignty (Rakotondrabe et al., 2021).

Drawing on principles of relational and decolonial methodology, this study addresses key implementation challenges identified in the literature, including the lack of integrative design methods, legal uncertainties, inclusivity gaps, and resource constraints (Girard et al., 2022), and reflects on the challenges, insights, and transformations that emerged during the co-design process. The paper advances practical and methodological insights into how BPs can serve not only as protective legal instruments, but also as living, relational tools that support community governance, intercultural dialogue, and the defence of biocultural territories. In doing so, we contribute to current debates on biocultural governance, Indigenous Peoples' rights, and values-based approaches to research and development in bioculturally diverse territories.

2. Materials and methods

Study area

This study was carried out with 10 Maya Q'eqchi' agricultural cooperatives in Alta Verapaz. This department is located in the central highlands of Guatemala and has a distinctive humid subtropical highland climate shaped by its elevation, karstic terrain, and cloud forest ecosystems (INSIVUMEH 2019). The cool, misty highlands (1,000–1,800 m) are ideal for shade-grown Arabica coffee, while cardamom, a key cash crop, thrives in the wetter, lower-altitude cloud forests (Perez et al. 2014). Coffee became the dominant cash crop in Alta Verapaz in the late 1800s, heavily influenced by German settlers who established haciendas and built the Verapaz railroad to support export demand. This period witnessed profound land dispossession, altered labour regimes, and embedded smallholder communities in export economies. Over time, many Maya Q'eqchi' farmers in the region have persevered through challenges, such as civil conflict and market shocks, by forming cooperatives and federations that share resources, technical services, and collective marketing support, operationalising land stewardship without necessarily relying on state recognition, an act of de facto Indigenous governance (Scott 2012).

The Maya Q'eqchi' cooperatives we worked with are affiliated to the Federación de Cooperativas de las Verapaces Responsabilidad Limitada (FEDECOVERA R.L.), a second-tier federation, founded in 1976, composed of 42 first-level cooperatives and over 120 associations, representing approximately 33,000 producer families across Alta Verapaz. FEDECOVERA R.L. exports to all continents, maintaining full traceability and emphasising fair pricing for small-scale farmers. It operates under a business model that integrates social, economic, and environmental sustainability, by promoting crop diversification (coffee, cardamom, cocoa, tea, allspice, turmeric) and integrating agroforestry and forest restoration in its systems (Connect Americas 2024). FEDECOVERA R.L. provides marketing, technical and financial services to its member cooperatives. Export crops are grown in agroecological and organic systems which have been shown to improve environmental and socioeconomic outcomes in relation to traditional cash cropping systems. Cooperatives still maintain their own traditional

207 practices in their farming of what they call “basic grains”, which mainly entail staple foods critical to their diets,
208 such as maize and beans.

209 FEDECOVERA’s practices and organisational structures align with core principles of Indigenous Peoples’
210 autonomy, self-determination, and land stewardship. In this context, agroforestry, crop diversification, and
211 cooperative governance become forms of negotiated Indigenous sovereignty within global markets, rather than
212 contradictions that negate biocultural governance. For instance, cooperatives are governed through participatory
213 decision-making and assemblies in local languages and agroecology and reforestation programs incorporate Maya
214 Q’eqchi’ cosmology and respect for ancestral ecological knowledge. A typical structure of a cooperative is
215 presented in Figure 1.

216 [Insert Figure 1 here]

217 The representation of the Cooperative is through the Legal Representative, exercised by the President of the
218 Administrative Council, elected at the annual meeting of the General Assembly, for a period of two years and a
219 maximum of one consecutive term. In accordance with the bylaws of the Cooperative, the legal representative is
220 the person duly authorised before governmental and financial institutions and other entities. Within the
221 Cooperative there is also the Community Development Council (COCODE), in accordance with the National Law
222 of Urban and Rural Councils of Guatemala, which promotes administrative economic decentralisation to promote
223 the country's development. COCODE promotes and participates in projects at the community level before the
224 municipal authorities where it has its representation. The Vigilance Council is the body in charge of the supervision
225 and control of the cooperative. Likewise, the cooperative is supported by the forestry committee and women
226 committee. Finally, there are also Catholic and Evangelical religious leaders who can influence certain decisions
227 of the cooperative.

228 **Maya Q’eqchi’ cosmology**

229 The Maya Q’eqchi’, like other Maya peoples of the region, originated in a large migration that began in present-
230 day central Mexico near Tulan and headed toward the northern Guatemalan highlands. Specifically, it was in the
231 present-day department of Alta Verapaz where the Maya Q’eqchi’ established their original settlements and where
232 they had most of their pre-Hispanic development. The pre-Hispanic Maya Q’eqchi’ were characterised by the
233 cultivation of maize, the development of agriculture, and their sedentary settlements (INPI n.d.). According to
234 ceramic records, the Maya Q’eqchi’ settled approximately 600 BC, around some hills near the Chixoy and
235 Polochic rivers in Guatemala, where the cooperatives we work with are located (Aprende Guatemala 2021).

236 The Maya Q'eqchi’ worldview conceives the world in a holistic way, where human beings are intrinsically
237 connected to the cosmos and nature. For the Maya Q'eqchi’, there is an inseparable relationship between the
238 rational and spiritual aspects of life, especially in agricultural practices and the relationship with the land, which
239 is considered sacred. In the Q'eqchi' Maya worldview, “Utz K'aslemal” represents harmony, balance, and
240 wholeness, achieving individual and collective well-being in deep communion with Mother Earth, the cosmos,
241 ancestors, and the community. This alternative way of conceiving and living life is known as Buen Vivir (Good
242 Living) by the Quichua, Quechua, and Aymara peoples of Ecuador and Bolivia (and many other Indigenous
243 cultures of Latin America).

244 A central, often implicit, belief shared by many Maya Q’eqchi’ today is the concept of “Tzuultaq’a”. While the
245 term literally translates to “Hill-Valley,” it signifies far more than a geographical feature. “Tzuultaq’a” refers to a
246 sacred other-than-human presence that is foundational to the Maya Q’eqchi’ life: a divine guardian and owner of
247 the land and its abundance. This being also protects rivers, springs, streams, and the creatures that inhabit them.
248 “Tzuultaq’a” is both within the mountain and is the mountain itself. Every hill is considered a “Tzuultaq’a”,
249 though they are not all equal. The Maya Q’eqchi’ speak of “thirteen great ones,” the most powerful among them,
250 whose influence extends beyond the local to the regional or even cosmic scale. One of the great ones, “Qawa’
251 Siyab”, lies within the territory of the cooperatives we worked with. The practice of “Mayejak”, ceremonies
252 performed in the hills and related to planting, harvesting and other important times of cropping and peoples’ lives
253 (like building a new house), are important to maintain harmony with nature and ancestors (Ochoa, 2013). Like
254 other Maya ceremonies in homes, fields, and house-yards, “Mayejak” keeps alive a connection with land, animals,
255 and spirits, where asking permission, thanking “owners” of nature, and reciprocal offerings frame responsible use
256 of resources (Camacho-Villa et al., 2021).

257 **Development of the biocultural protocols**

258 This research was implemented within the context of a broader project aimed at establishing and sustaining
259 biocultural landscapes for Indigenous Peoples’ livelihoods, cultural heritage and biodiversity, through a series of
260 investments, including reforestation and agroforestry initiatives. Our research team was composed of non-

Indigenous and Maya Q'eqchi' researchers. The latter are staff members of FEDECOVERA R.L. and spend most of their working days in the field providing different types to technical assistance to the cooperatives that are affiliated to FEDECOVERA R.L. All are native Q'eqchi' speakers from the Alta Verapaz area and some are even cooperative members themselves. Thus, these members of the research team played key roles as cultural mediators, facilitators, and knowledge holders. Two of these members led the implementation of the process and are co-authors in this paper.

The non-Indigenous researchers (other two co-authors in this paper) have been working with Maya Q'eqchi' in Guatemala for several years and one of them has had a history of collaboration with FEDECOVERA R.L. and its cooperatives for over a decade. These researchers have also collaborated with Indigenous Peoples in other countries and strived for intercultural and respectful knowledge co-creation across different contexts, with the ultimate goal of supporting Indigenous Peoples' self-determination in research. This intercultural collaboration shaped all phases of the process, allowing for ongoing reflection on positionality, power dynamics, and language as we supported cooperative members in articulating and formalising their own BPs. The presence of the same bilingual Maya Q'eqchi'-Spanish staff from FEDECOVERA R.L., who are well known by the cooperatives and accompanied the ten cooperatives throughout the whole development of the protocols, was essential not only for translation, but for facilitating intercultural and inter-epistemic knowledge exchanges and for building trust throughout the co-design process.

The research process was grounded in the principle of Free, Prior, and Informed Consent (FPIC), with cooperative members engaging voluntarily and with full clarity on the aims, uses, and limits of the BPs. Protocols were developed and reviewed collectively, with co-ownership ensured through community control over their content, future application, and decisions regarding disclosure. In recognition of their sensitive and strategic nature, all protocols remain confidential unless and until cooperatives decide to share them publicly.

The research team developed a proposal and methodological guide to support the drafting of BPs by 10 Maya Q'eqchi' cooperatives: Santa Maria San Marcos, Concepcion Secuachil, Actela, Las Nubes, Vista al Valle, Santo Domingo, Santa Monica, Santa Rosita, Ruinas Maya Chijolom and Camelias. The proposed structure and objectives of the BPs was informed by the only two existing manuals we found (CONABIO-GIZ, 2017; Natural Justice, 2012) and discussed with cooperatives. However, the workplan and specific activities agreed with the cooperatives for the purpose of developing the protocols stemmed from the team's own ideas based on decades of experience working with cooperative members. Draft versions of the methodological tools were proposed by the Maya Q'eqchi members of the research team, who, as staff members of FEDECOVERA R.L. (and some of them cooperative members themselves), have a deep understanding of participatory engagement tools that are culturally appropriate, empowering and effective at enabling an intercultural knowledge dialogues. The methodological tools were implemented over a total of 114 sessions (among the 10 cooperatives), after the approval of the cooperatives to start the process and before the validation of the BPs by the General Assembly. The tools have been integrated in a methodological manual and shared with the cooperatives and representatives of CONAP (the National Council for Protected Areas).

Each cooperative developed their own BP, through a participatory process, to describe their core cultural and spiritual values and customary laws related to their traditional knowledge and resources. Based on these values and laws, the BPs aimed to provide clear terms and conditions governing access to their traditional knowledge and resources. The protocol development process was divided into six main phases:

Phase 1: Presentation to each cooperative's Administrative Council and Vigilance Council of the proposal for the development of a biocultural protocol and discussion of its aims and development process.

Phase 2: Identification of a working group for the construction of the Biocultural Protocol. In each cooperative, this was formed by a diverse group of ten members chosen by the cooperatives themselves and representing the cooperative's governance structures as well as the voices of elder and young members, male and female: two from the cooperative's Administration Council, one from the Vigilance Council, one male elder, one female elder, one midwife, one male young member, one female young member, one from the Forestry Committee, and one from the Agricultural Committee (in the cooperatives where this exists). Shamans were included in the working groups of three of the cooperatives.

Phase 3: Collection and systematisation of the protocol's content through participatory activities. Each cooperative chose the format that their BP would take, such as oral or audiovisual forms or written manuals. The methods used to co-design the protocols' content included participatory mapping, guided focus group discussions, timelines, visioning exercises, evaluation of the cooperative's capacities through the "spiderweb" method, and SWOT analysis.

Phase 4: Drafting of the protocols by the Maya Q'eqchi' members of the research team.

316 Phase 5: Discussion, review, validation, and approval of the protocols through each cooperative's annual General
317 Assembly. All cooperative members attended the annual meeting of the General Assembly and the protocols were
318 approved by unanimous vote.

319 Phase 6: Dissemination of the existence and development process of the BPs to government institutions linked to
320 the Cooperatives, such as the National Council of Protected Areas (CONAP), the National Forest Institute (INAB),
321 the municipalities and the Ministry of Environment and Natural Resources (MARN). The aims of the BPs were
322 presented in the final stakeholder workshop of the project, which included representatives of various national
323 government departments (such as the Ministry of Environment, the National Council of Protected Areas, and the
324 National Forests Institute) and international governments (UK Embassy in Guatemala and Defra), as well as in
325 visits to these departments in the context of another project.

326 **Assessment of the biocultural protocols**

327 Given the novelty of this type of mechanisms in Guatemala and the sparsity of evidence on the process of
328 facilitating the development of BPs, the research team decided to conduct an internal reflexive evaluation that
329 could generate useful insights for others embarking in similar initiatives in other parts of the world. Given the
330 aims of the BPs, the research team assessed the process of developing these against four criteria related to
331 international Indigenous Peoples' rights frameworks, Indigenous Peoples' data governance principles, and
332 guidelines for ethical engagement with Indigenous Peoples, both within and outside research contexts (Figure 2).
333 Although the criteria were initially informed by such frameworks, the specific questions that we discussed and
334 that underpin the analysis were developed alongside the process of developing the BPs, as the experience itself
335 presented challenges and learnings along the way. These criteria prompted us to reflect on key considerations for
336 the replication of our approach to supporting the development of BPs in other contexts. The criteria are:

337 1) Inclusivity of representation. The criterion concerns the meaningful involvement of community members across
338 gender, age, kinship, and governance roles in agenda-setting, deliberation, and decision-making in the process of
339 developing the protocols. Broad, community-defined participation incorporates diverse interests and knowledge
340 systems, underpinning procedural legitimacy, mitigating elite capture, and aligning with self-determination as
341 articulated in UNDRIP (Shrumm & Jonas, 2012; SCBD, 2004; United Nations, 2007).

342 2) Cultural and linguistic identity. This refers to the extent to which protocol terms, concepts, and justifications
343 are expressed in languages and conceptual frames that reflect local worldviews and are intelligible across
344 interlocutors. Accurate representation of identity is essential to avoid mistranslation of key ideas (e.g., territory,
345 custodianship, consent) and to sustain community uptake over time, consistent with the Akwé: Kon guidelines'
346 emphasis on integrating cultural considerations into governance processes and centring Indigenous Peoples'
347 epistemologies (SCBD, 2004; Smith, 2012).

348 3) Collective ownership and control. This criterion addresses collective authority over protocol content, approval,
349 storage, access, and disclosure, including the right to maintain confidentiality. Ownership operationalises
350 UNDRIP Article 31 on control of traditional knowledge and other international normative framework of FPIC
351 such as the International Labour Organization Convention 169 (ILO 169), and the Convention on Biological
352 Diversity (CBD), and is reinforced by Indigenous data governance frameworks (CARE; OCAP®), which
353 prioritise collective benefit, authority to control, responsibility, and ethics in data and knowledge stewardship
354 (Global Indigenous Data Alliance, 2019; FNIGC, n.d.; United Nations, 2007). While ABS standards provide the
355 legal obligation to share benefits fairly; BPs provide a platform for communities to define on their own terms what
356 "fair, lawful access and sharing" means in practice, including setting out their own rules of engagement with
357 external actors for the achievement of Free, Prior and Informed Consent (FPIC). BPs have the potential to help
358 communities decide for themselves whether or not to engage with ABS, as well as other legal and policy
359 frameworks, in ways commensurate with their values, own development aspirations, customary laws, and
360 traditional institutions (Jonas et al. 2010).

361 4) Ethical engagement. This criterion relates to the relationships between external actors (including the research
362 team) and the Indigenous collectives that developed their own BPs (cooperatives in our case). Indigenous Peoples'
363 rights, particularly to self-determined development, are still rarely recognised by many nation-states, academic
364 institutions and other actors involved in knowledge creation (Carmona et al., 2024). It is therefore critical to
365 identify processes for respectful collaboration, knowledge creation and knowledge sharing that uphold Indigenous
366 Peoples' rights (Hill, 2023). Here we reflect on facilitation roles, power dynamics, translation challenges, and
367 institutional pressures, with resulting adaptations to safeguard community priorities.

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369

[Insert Figure 2 here]

Throughout the results and discussion sections we connect our analysis to these criteria. It is important to note that the framework is not an evaluative tool imposed on cooperatives, but an analytical, non-linear and reflexive heuristic used by the research team ex-post (after all protocols had been approved) to assess the process of developing the protocols and highlight key aspects and learnings from the process of protocol drafting. As such, it did not have any bearing on the co-design process of the protocols themselves. A list of question prompts that the research team used to structure the internal discussions that supported the assessment can be found in the Appendix. While we acknowledge that it would have been of value to include the working groups of cooperative members in this reflexive process, our project timelines did not allow this engagement to occur.

3. Results

In this section, we first describe the objectives, format, content and structure of the BPs, as co-designed with the ten cooperatives we worked with. We then analyse the process of facilitating the development of the BPs and the opportunities and challenges that we encountered along the way. Throughout the section, we make reference to the four assessment criteria that guided our reflections ex-post.

Format, content and structure of the protocols

For all ten cooperatives, the overall aim and objectives of the BPs, as agreed by each working group and approved in the annual meeting of the General Assembly, were very similar. The overall aim was that cooperatives have an instrument that allows them to manage their biodiversity and associated traditional knowledge. This aim ensured the protocols' alignment with rights frameworks, while remaining rooted in cooperative governance (assessment criterion 3). Specific objectives included to: (i) strengthen local governance capacities for biodiversity conservation, sustainable use, the protection of traditional knowledge associated with biological resources, and the fair and equitable distribution of benefits derived from their use, both by actors within the cooperative and external to it; (ii) prevent illegal access to biological resources and traditional knowledge; and (iii) recognise, respect and value the role of cooperatives in managing biodiversity conservation and sustainable use based on their traditional knowledge and practices.

These objectives also provided a baseline for evaluation of current processes of engagement between external actors and Indigenous Peoples (assessment criterion 4), for example, by reviewing whether benefit-sharing and conservation commitments are being practiced as intended. Thus, the BPs developed served a dual function: a call for recognition of cooperatives' norms in FPIC and benefit sharing processes and a political-ontological claim, associating the former call to the cooperative's cultural, spiritual, ecological and economic values. As such, the BPs stand as attempts to bolster the cooperatives' position in asserting their rights to land, territory, cultural sovereignty, and self-governance.

Regarding the structure of the BPs, there was no significant variation across cooperatives since the cooperatives are from the same region and therefore share many similarities in their ways of life, language, customs and traditions, and ancestral knowledge and practices. Structural similarity (as assessed by the Maya Q'eqchi members of the research team who are all from the Alta Verapaz area and work in the cooperatives on a daily basis), made the BPs consistently recognisable to state and third-party actors without constraining local variation in emphasis. We had originally envisaged to develop highly practical protocols, in oral and visual forms such as posters, flow charts and similar representations about what rules people accessing the cooperatives' knowledge must follow. However, in our case, cooperatives requested that the protocols be developed as simple written manuals and so they were developed with this in mind. Although each protocol differed due to the specific biological and cultural diversity of the cooperatives, the protocols covered the same general topics, including:

1. A self-definition of the group and its leadership and decision-making processes. In general terms, all the cooperatives were very similar in this respect. They are all first-degree cooperatives, established as collectively held landholdings within which there are collectively managed areas and individually managed areas. Cooperatives grow coffee and cardamom in agroforestry systems. All are governed by an Administrative and a Vigilance Council), have written bylaws, and operate according to regular plans and budgets.

2. The links between their customary laws, biocultural ways of life, and spiritual understanding of nature (assessment criterion 2). The cooperatives documented their cosmovision, the importance of their traditional ceremonies, the intergenerational loss of traditional knowledge and relational practices, and the consequences of such loss. Although the protocols remain of strict confidentiality to the cooperatives, participants did not disclose specific details of their traditional ceremonies or ancestral knowledge. The careful delineation of what remains confidential by the cooperatives themselves operationalises community control (assessment criterion 3).

3. A Biocultural Register, produced by the cooperative, containing information on the availability and knowledge of local biological and genetic resources and their associated traditional knowledge. The register aimed to support inclusivity (assessment criterion 1) by ensuring everyone's knowledge is represented.

4. How they promote in situ conservation of native plants or indigenous livestock breeds and/or wildlife. Cooperatives documented current practices and proposed potential additional measures to enhance conservation.

5. Their local challenges of various kinds, such as environmental, socioeconomic, demographic and cultural.

6. How they share their traditional knowledge, and the dynamics and challenges of intergenerational knowledge transmission.

7. What constitutes free, prior, and informed consent to access their lands or traditional knowledge and how it intersects with the cooperatives' norms (assessment criterion 3).

8. Their rights under national and international law.

9. A call to the various stakeholders to respect their customary laws, their cooperative protocol, and a statement of the various types of assistance the cooperative needs (assessment criterion 4).

A leaflet was developed in Spanish to summarise the process of protocol development and the contents of the protocols (see the Appendix).

Process of developing the protocols

The process of developing a protocol counts as much, if not more, than the content itself. The question is significant because the process of developing the protocol is featured as the building block of a more extensive process aimed at empowerment of the cooperatives. The methodology applied was the same; however, the group dynamics were different, as each group had its own unique characteristics: responding spontaneously or quickly, or in other groups requiring more detailed explanations to ensure the information was understood. These differences make inclusivity (assessment criterion 1) a practical consideration and required that facilitation had to be adapted so that varied voices were enabled to contribute substantively. The main challenge was starting the consultations and explaining the objectives and purpose of the biocultural protocols. Key insights that emerged during the co-design process relate to knowledge sharing and protection, heterogeneous priorities, language and capacity barriers, and institutional challenges.

The issue of knowledge protection surfaced as the main worry of participants during the process, especially elders. Obtaining information about medicinal plants and traditional practices and ceremonies was challenging. Although working groups were assured that the BPs would remain confidential to the cooperatives (with their access managed by Administrative Councils), the fear remained that such information would be made public. Their ancestral knowledge is sacred and specific to each cooperative in each territory. In the public domain, they can be misrepresented, misinterpreted or misused by outsiders seeking personal gain. In addition, prejudices still exist, with Mayan priests often considered witches or using dark practices. Concerns about misuse and misappropriation are compounded in the face of digital risks, including emerging AI technologies, and were central to decisions to limit disclosure and hold BPs only in physical form. These dynamics affirm community ownership and control (assessment criterion 3) as a core criterion: confidentiality is not a constraint but an expression of sovereignty and ethical stewardship.Although specific details of traditional knowledge were not disclosed, the process of developing the protocols provided a fertile ground for young members of the working groups to begin to understand the importance and the reason for documenting and honouring ancestral knowledge and practices, ways of life, customs, and traditions that are still maintained and practiced in the cooperatives. While elders practise ceremonies, consistently use their ancestral knowledge and refer to nature as sacred, most young people are either unaware of these practices and ceremonies, while the other half are aware but do not practice them. It is worth mentioning that in the face of globalisation, some young people migrate (although at a much lower rate than in other rural areas in Guatemala), and many adopt other practices and traditions and do not participate in intergenerational knowledge exchanges, and this leads to a loss of their identity. Here, inclusivity (assessment criterion 1) is tied to intergenerational transmission: the protocol process itself becomes a space of youth engagement and future leadership development.

Another key challenge in the development of the BPs was navigating the heterogeneity of priorities and power asymmetries among cooperative members. We had to be wary of falling back into the romance of cooperatives as necessarily internally harmonious and united by common norms and interests and presumed to manage natural resources sustainably by default (Coombes et al. 2013). Notably, there were differing views regarding the relevance and enforcement of internal rules and norms, including long-established regulations governing coexistence, resource use, and community obligations. These tensions surfaced particularly in discussions about the applicability and legitimacy of these norms, which, while formally documented, are not consistently applied or respected, often depending on the leadership in place at any given time. This variability was especially evident

among the younger generation of members, many of whom represent the third generation of cooperative participants, who at times questioned or rejected these norms altogether. As a result, the protocol process became not only a site for codifying shared principles, but also a space for intergenerational negotiation, raising important questions about continuity, adaptability, and authority within collective governance. This became particularly evident around discussions on the need for revitalization of traditional practices on medicinal plant use and for the promotion of respect towards people in the cooperatives that conserve cultural practices, such as traditional medicine and traditional Mayan ceremonies. Such contestation underscores why documenting disagreements and subsequent adjustments, strengthens the durability and perceived fairness of protocols.

While the entire consultation and information-gathering process was conducted in the cooperatives' local language (Maya Q'eqchi'), a significant challenge that emerged was the complexity of translating key terms and concepts between Maya Q'eqchi' and Spanish, both linguistically and culturally. Many of the ideas central to the protocols, such as notions of territory, nature, land, collective responsibility, or spiritual relationships with the land, carry meanings in Maya Q'eqchi' that do not have direct equivalents in Spanish, and vice versa. This often required extended discussions between the Maya Q'eqchi' members of the research team and cooperative members to interpret, contextualise, and agree upon shared understandings, highlighting the limits of literal translation and the importance of cultural framing. Moreover, while the BPs were prepared in Spanish, the research team is currently working on their translation into Maya Q'eqchi' to ensure accessibility and legitimacy within the cooperatives. However, this process is not only time-intensive but also resource-dependent, requiring the involvement of fluent bilingual speakers with deep familiarity with both technical and Maya Q'eqchi' vocabularies. Ensuring high-quality translation thus emerged as both a practical necessity and an ethical commitment, underscoring the need for adequate time, funding, and community-based expertise to support meaningful multilingual engagement in protocol development. These efforts directly evidence the critical importance of cultural and linguistic identity as an assessment criterion and justify resourcing for sustained bilingual capacity.

Given that the development of the biocultural protocols was a first-time experience for both the research team and the cooperative members, the extent of the research team's involvement in the preparation, drafting, and implementation process was necessarily significant. The team played an essential role in guiding the overall structure and sequencing of the protocol development, providing methodological support while maintaining a participatory ethos throughout, being very aware of our positionality at all times and lending our privilege and power to amplify the voices of cooperative members. At each stage, including discussion, content approval, and validation, the team consulted closely with cooperative members to ensure that the information reflected their perspectives, priorities, and intentions. Additionally, the research team took on the task of drafting and consolidating the content into a coherent document, a role made necessary by the fact that many participants had limited access to, or experience with, computers and formal documentation processes. Rather than undermining participation, this facilitative approach helped bridge practical barriers to engagement while preserving community ownership over the protocol's content and direction. Documenting these facilitation choices (and when the team intentionally stepped back), supported our reflexive evaluation and helped guard against unintended influence.

Finally, an important challenge in the development of the biocultural protocols involved navigating institutional expectations and scepticism from both international funders and national state actors. While the process was grounded in a commitment to cooperatives' sovereignty over their BPs, this stance conflicted with external demands for continuing to exert power over data on Indigenous Peoples. In particular, the fact that the content of the protocols remained confidential and under the cooperatives' control was met with reluctance and distrust. Both the principle of Free, Prior, and Informed Consent (FPIC) and Article 31 of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) affirm the right of Indigenous Peoples to maintain control over their traditional knowledge, cultural expressions, and decision-making processes, including the right to withhold information from external institutions. This tension revealed deeper structural misalignments between institutional accountability frameworks and Indigenous Peoples' governance models, underscoring the need for more flexible, rights-based funding and policy approaches that centre Indigenous Peoples' authority and epistemic autonomy. From an assessment standpoint, these interactions reinforced the research team's commitment to "hold the line" and continue, through our research choices, to uphold the rights of Indigenous Peoples to collect and govern their own data. It also highlighted the importance of researchers to practise creativity as they navigate these tensions and consider the types of evidence that they can generate to satisfy institutional accountability while remaining true to principles of ethical engagement (assessment criterion 4). Our sustained stance reaffirmed that community ownership/control (assessment criterion 3), including the right to withhold information, is a legitimate outcome, not a deficit.

4. Discussion

In this section we situate our results within the wider literature on biocultural protocols and community-led initiatives developed by or with Indigenous Peoples that pursued interconnected objectives including biodiversity protection, cultural revitalization, economic development, and rights recognition. We structure our discussion on three aspects of the development of the BPs: how these are conceptualised (ultimate aims, underlying principles and frameworks, integration of Indigenous knowledge and values), how these are implemented (key actors and processes, challenges and barriers and enabling conditions), and what impacts they have in practice (conservation, socioeconomic and political outcomes, unintended consequences and timeframes). Throughout the discussion, we continue to draw on the four assessment criteria presented in Figure 2.

4. Discussion

Conceptualisation

Scholars increasingly call for approaches that enable authentic co-production of knowledge, where the worldviews and epistemologies of Indigenous Peoples are upheld rather than marginalised by dominant scientific paradigms (Burke et al. 2022). The development of the BPs in Alta Verapaz illustrates an instance of knowledge co-production, where plural epistemologies were not only acknowledged but structurally integrated into a collectively validated governance tool. As with similar Indigenous-led initiatives in other parts of the world, holistic lifestyle approaches and inextricable links between the ecosystem, the land, resources, and the knowledge, culture, and livelihoods of cooperatives were highlighted in the BPs (Nemoga et al., 2022; Pengelly et al. 2012; Sibuye et al., 2012).

Reciprocity and relationality were key guiding principles. This was exemplified by the inclusion of the celebration of the "Mayejak" ceremonies in all of the ten BPs, closely linked to the agricultural cycle (primarily maize), but also performed as gratitude to the elements of nature, to request rain, the cessation of droughts or tropical storms or at the beginning of a construction project to request permission to use the materials provided by the land. Such content affirms cultural identity (assessment criterion 2) and mirrors similar conceptualisations of nature in other Indigenous-led conservation initiatives in other parts of the world. For instance, the Mi'kmaq concept of "Netukulimk" emphasized reciprocal relationships with wild species and support for biocultural values in Indigenous-led conservation of culturally significant species in Ktaqamkuk (Newfoundland, Canada) (Lukawiecki et al., 2025); the Hawaiian Nā Kilo ʻĀina biocultural monitoring and capacity building program focused on strengthening reciprocal "pilina" (relationships) between people and place (Morishige et al., 2018); and environmental governance in Karen communities in the Salween Peace Park, an Indigenous-led conservation initiative in the autonomous Karen territory of Kawthoolei, centered on relational ontologies and more-than-human agency (Paul et al., 2021).

The BPs also served to highlight the role of cooperatives as "guardians" or "custodians" of nature, arising from historical, spiritual, and sociocultural ties to the land. However, the BPs clarify that this role is reciprocal with nature (nature is both a caretaker and an entity to be cared for) and valued not only for their ability to maintain conservation practices, but also for their intrinsic value to nature, their cultures and heritage. The BPs are governance instruments that articulate responsibilities to Tzuultaq'a, rather than replacing or superseding more-than-human authority. The mountain's guardianship remains presupposed within the protocols; what is codified is how humans connect to nature in relation to that authority. This reflects scholars' caution of the impact of casting Indigenous Peoples primarily as guardians or stewards on essentialising their identities, reducing them to environmental functions, or instrumentalising their relationship with land for external conservation goals (de la Cadena and Blaser 2018; Whyte 2020). Such portrayals risk flattening political struggles over land, autonomy, and governance into narratives of ecological virtue and can also be co-opted by state and NGO actors to justify participatory conservation models that sidestep deeper issues of land restitution and self-determination (Reed et al. 2021).

Framing Indigenous stewardship within the language of rights, responsibility, and relationality, rather than utilitarian guardianship, offers a more respectful and politically grounded understanding of their roles. The BPs developed in Alta Verapaz affirm that Maya Q'eqchi' land management is not a service to the global commons, but an expression of ongoing care and jurisdiction rooted in distinct worldviews. Similarly, BPs developed by traditional health practitioners in Bushbuckridge, South Africa, assert their traditional and continuing customary roles within their communities and their rights over their land, resources and knowledge (Sibuye et al., 2012). This framing secures alignment with rights frameworks (assessment criterion 3), positioning stewardship within claims to jurisdiction and FPIC.

Finally, a key aspect of how the BPs were conceptualised relate to how cooperatives thought they are perceived by external actors and how they perceived themselves in terms of their resistance to cultural homogenisation and the implications of this resistance for local biodiversity management. The BPs recognise cooperatives as forms of

593 social organisation, and cooperative members as aware of their rights and obligations as members of this form of
594 social organisation. In this context, the BPs were conceptualised as living documents, not fixed contracts, with
595 cooperative members acknowledging that much progress remains to be made to enhance biodiversity conservation
596 by strengthening knowledge exchange processes and boundary work across diverse epistemic boundaries
597 (Löfmarck and Lidskog 2017). Similarly, in the Indigenous territory of Guna Yala in Panama, protocols were
598 developed as part of continuous negotiation and adaptation rather than fixed agreements. In this case, protocols
599 are part of an ongoing "collective reflection on the defence of Gunadule territory and culture, a process that entails
600 the drafting of more or less formal regulations" (Foyer et al., 2024). In other cases, BPs are conceptualised as
601 "hybrid" instruments that must navigate between different legal systems and cultural contexts, suggesting that
602 they need to be adaptable rather than rigidly fixed (Girard et al., 2022).

603 **Implementation**

604 The BPs included essential content to support their implementation, such as the articulation of connections
605 between Free, Prior, and Informed Consent (FPIC) and locally grounded norms and decision-making procedures.
606 They assert the need for recognition by all external actors (including government authorities) of these community-
607 defined FPIC practices, and they articulate claims to rights over natural resources, traditional knowledge, and
608 territorial governance. In doing so, the protocols affirm local norms for FPIC and benefit-sharing as rooted in the
609 cooperative's cultural, spiritual, ecological, and economic values, inseparable from their relationship to specific
610 lands and territories. This provides a clear pathway for ethical engagements with external actors (assessment
611 criterion 4) while protecting ownership/control (assessment criterion 3) over how consent is sought and given.

612 Some cooperatives have proposed to include the BPs as part of the Administration Council and Education
613 Committee's role for the development, dissemination, and promotion of information to members, so that it can be
614 used as a basis for internal and external agreements regarding the use and access to the cooperative's resources.
615 However, as in other experiences in other parts of the world (Burke et al. 2022), gaps remain in building
616 cooperatives' capacity for leadership over protocol design, legal advocacy, and negotiation with external actors.
617 For instance, cooperatives lack the expertise and resources to navigate complex international legal frameworks,
618 as protocols interface between "local, domestic, international" normative levels. Further, although not applicable
619 to our case, there exists the challenge of "NGOization" where communities become dependent on external NGOs
620 and legal advocates rather than developing internal capacity (Girard et al., 2022).

621 Besides their recognition and enforcement, another important point for effective implementation is sustained
622 engagement and facilitation. The process of developing and updating protocols requires continuous, culturally
623 competent facilitation and resources that are often lacking (Senabre Hidalgo et al. 2022). Cooperatives carry out
624 their normal activities and practices in accordance with their knowledge and traditions, but these are not written
625 down, merely passed down from generation to generation orally. This concern about the future of the BPs has
626 translated in a desire of the cooperatives to use the BPs as tools to obtain potential sources of financial support for
627 biodiversity conservation, protection of ancestral knowledge and practices and organisational strengthening.
628 However, the conditions for effective resource mobilisation in this space remains an understudied area with
629 Lukawiecki et al. (2022) observing that "biocultural theory remains largely conceptual in nature, with indications
630 that only in recent years have more applied, on-the-ground case studies started to emerge".

631 **Impact**

632 The BPs were able to open a space to promote a better understanding of the livelihoods and worldviews of the
633 cooperatives involved. Based on the group's greater understanding of the legal and political context of their rights
634 under national and international law, discussions arose about reinforcing internal norms and regulations that have
635 been lost and actions to conserve biodiversity, especially protecting water sources, hills, and forests, with a view
636 to future generations. Leaders became interested in voluntarily promoting cultural practices and showed respect
637 for those who practice and preserve cultural practices, such as traditional medicine and the celebration of Mayan
638 ceremonies. Reinforcing existing customary governance structures and community identity was also an outcome
639 of BPs in other contexts (Foyer et al., 2024; Girard et al., 2022). However, existing sources also note BPs can
640 sometimes serve as tools for "eco-governmentality" that may undermine rather than strengthen authentic
641 traditional governance systems. Some BPs in Madagascar resulted in "statutory uniformisation" that replaced
642 genuine customary authorities with new institutions that only had "the trappings of 'tradition'". These new
643 governance structures were actually designed to meet state requirements rather than reflect genuine customary
644 authority (Anquet & Girard, 2022).

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647 The BPs development process also contributed to the empowerment of the cooperatives. This is a process; and
648 with this initiative, a precedent was set and a path initiated. Through the participation of working groups in each

of the cooperatives, we raised awareness and awakened interest in rescuing and promoting cultural and traditional activities for future generations. We also noted the awakening or interest among young people in rescuing ancestral knowledge or practices that, over time, had been abandoned due to lack of generational transmission, ignorance, or lack of interest. Our experience contrasts with BPs in other areas, where youth participation in protocol development was not a priority or was constrained by practical and structural factors. In some cases, protocol development has been dominated by established leadership structures (Girard et al., 2022), while other studies point to development processes being captured by local elites (Girard & Rakotondrabe, 2022).

These observations point to the importance of identifying inclusivity outcomes (assessment criterion 1) that future reviews can track using participation and leadership indicators. Long-term, there is a lack of systematic evaluations on the effectiveness of biocultural protocols in protecting traditional knowledge, biodiversity, and cultural resilience. Empirical studies on outcomes, both intended and unintended, remain rare.

Regarding the possibility of incorporating the protocols as recognised tools in national policies related to biodiversity and traditional knowledge, it will be a long process, and significant political will is required for their recognition as a tool for the conservation of traditional knowledge and biodiversity. The literature indeed shows that while some protocols have achieved significant legal recognition and contributed to political empowerment (Anquet & Girard, 2022; Jansen & Sutherland, 2022), outcomes varied greatly depending on political context and community organization capacity. This lack of political will to turn "legal pluralism" into practice is a challenge for the cooperatives that can erode the transformative potential of BPs. A crucial step in the path towards formalisation of legal pluralism would be to select a group or group leader who participated in the BPs construction process and who could socialise the BPs before various government actors, at multiple levels. There are emerging but underutilised opportunities for digital tools to facilitate networked sharing of the existence of protocols. More experimentation and documentation in this space are needed (Senabre Hidalgo, 2022).

Finally, the BPs could potentially serve to support the development of an image of cooperatives as champions of an alternative economic development model, in harmony with nature, and in opposition to preconceptions of cooperatives as backward or premodern. They can also be used as a tool or platform to seek funding to continue strengthening the organisations, their members, biodiversity conservation and strengthening governance processes for conservation. In this respect, it is not simply a matter of funding levels: the source and conditionality of resources matter. Funding mechanisms must align with Indigenous priorities and governance structures. For instance, the Andean Potato Park's revenue redistribution based on Andean principles of reciprocity and equilibrium demonstrates how resource allocation reflecting Indigenous values supports sustainability (Swiderska & Argumedo, 2022).

5. Conclusions

The collaborative development of biocultural protocols with ten Maya Q'eqchi' agricultural cooperatives in Alta Verapaz offers important contributions to ongoing efforts to reimagine ethical research, uphold Indigenous Peoples' sovereignty, and enact legal pluralism. As community-defined tools, the protocols serve not only to articulate rights and responsibilities around land, knowledge, and consent, but also to formalise locally grounded decision-making processes in ways that are comprehensible across cultural, legal, and institutional settings. In doing so, they embody a values-based, relational approach to governance rooted in Maya Q'eqchi' worldviews, spiritual relationships with territory, and intergenerational dialogue. At the same time, the process sheds light on the epistemic, institutional, and linguistic tensions that must be carefully navigated to ensure that protocols genuinely reflect community priorities rather than external agendas. The four assessment criteria provide a concise framework for identifying and navigating these tensions while ensuring protocol legitimacy.

For future studies engaging in the design of biocultural protocols with Indigenous communities, several lessons emerge. First, protocols must be treated not as static instruments but as living, adaptive processes, emerging through trust-building, collective deliberation, and reflexivity. Second, methodological flexibility is essential; protocols must accommodate internal diversity, generational shifts, and plural understandings of authority and value. Third, the co-design process itself must be grounded in Free, Prior, and Informed Consent (FPIC), not only as a principle to be codified but as a practice of ongoing negotiation. Finally, institutional actors,including funders, researchers, and policy-makers, must be willing to accept and support community-defined conditions of confidentiality and sovereignty, even when these diverge from dominant norms of visibility, documentation, and control.

Ultimately, to co-create a protocol without co-opting voice requires a fundamental shift in how collaboration is conceptualised. It means relinquishing control, foregrounding Indigenous Peoples' epistemologies, and creating space for asymmetries to be named rather than obscured. It means recognising that the value of a protocol lies not only in its content, but in the collective process of articulation, contestation, and affirmation that gives it meaning.

705 In this sense, the biocultural protocols developed with Maya Q'eqchi' cooperatives are not just governance tools;
706 they are expressions of jurisdiction, memory, and future-making.

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Appendix – Guide questions for internal assessment of the protocols

1. Were the objectives of the BPs the same or similar in all cooperatives? Or did some propose different objectives?

2. How did the final protocol structure vary from one cooperative to another? What accounts for these variations?

3. Were there differences among cooperatives (or among members of a cooperative) regarding the nature of the planning processes? For example, what issues were included? In what format? What level of simplicity/practicality was considered?

4. How did the methodology vary from one cooperative to another? What significant differences emerged? Were there variations in the formation of the consultation groups? Which ones? Why? What kind of challenges arose during the process?

5. Were there differences in the ways men and women, and people of different ages, were involved in the development of the protocol?

6. In the process of developing the protocols, did discussions arise about plans to implement other types of collective action based on the group's greater understanding of the legal and political context of their rights under national and international law?

7. Are there indications that the BP development process has contributed to the empowerment of cooperatives or groups of people within them?

8. What challenges arose regarding the scope/delimitation of the BPs and the cooperatives? Are there different interests, priorities, and agendas within the cooperatives regarding the use and management of natural resources? How did these manifest themselves in the development of the BPs? How were the differences resolved?

9. Did differences arise among group members regarding interpretations of structures and norms for resource and knowledge management, and what should or should not be included in the BPs?

10. To what extent was the development of the protocols determined by the project team involved in the preparation, drafting, and implementation process? Did the degree of autonomy vary from cooperative to cooperative?

11. Has any cooperative used their protocol or disseminated its existence in any way?

12. What is the likelihood that the protocols will be incorporated as recognized tools in national policies related to biodiversity and traditional knowledge? What actions could be implemented to ensure their consideration?

13. What preconditions would need to exist to formalize legal pluralism (recognition of community norms present in the BPs)?

14. Would cooperatives generate their BPs without external support/facilitation? Why/why not?

15. Have the BPs been able to create a space to promote a better understanding of the livelihoods and worldviews of the cooperatives involved? What other strategies/actions could contribute to such understanding?

16. Could the cooperative projects potentially help shape an image of cooperatives as champions of an alternative model of economic development, in harmony with nature, and in opposition to preconceptions of cooperatives as backward or pre-modern?

17. To what extent have cooperative projects addressed issues of land tenure, especially in connection with the right to cultural heritage and ancestral knowledge?

18. What examples exist in cooperative projects where holistic approaches to lifestyles have been highlighted or emphasized—that is, the inextricable links between the ecosystem, land, resources and knowledge, culture, and the livelihoods of communities?

19. Are there any mentions in the BPs (or was it discussed in the processes) of cooperatives assuming a role as “guardians” or “custodians” of nature, stemming from historical, spiritual, and sociocultural ties to the land, which translate into customary norms and institutional agreements that regulate, and sometimes prohibit, access to and use of resources and knowledge?

20. Are there any mentions in the BPs regarding how cooperatives are perceived by external actors and by themselves in terms of resistance to change, progress, and integration into global markets in order to maintain traditions for local biodiversity management?

21. Are traditional ways of life valued for their intrinsic value to cultures/heritage or only for their ability to maintain conservation practices?

22. Are there any mentions in the BPs of traditional practices that threaten the conservation of natural resources? What is the cooperatives' proposal in response to these practices?

23. Do traditional governance systems allow cooperatives to respond effectively to the complex landscape of free, prior, and informed consent (FPIC)? Has the distribution of benefits been addressed in traditional internal rules, given that, in most cases, access to resources and traditional knowledge constitutes a new form of interaction with external actors?

24. BPs can have various functions and political importance. Do the BPs developed by the 10 cooperatives contain the following:

- Connections between FPIC processes and local norms and procedures;

- A call for the recognition of local FPIC procedures within national policies;

- An assertion of the cooperative's rights over natural resources, traditional knowledge, and/or its territory;

- An assertion of local norms regarding FPIC and benefit-sharing, based on the cooperative's cultural, spiritual, ecological, and economic values and linked to a specific land and territory?

Appendix – Leaflet (in Spanish)

DESAFÍOS

- Romper las barreras socio-económicas y educativas que limita la recopilación y actualización los protocolos bioculturales.
- Visibilización de los protocolos bioculturales a nivel local, nacional e internacional.
- Contrarrestar los conflictos internos provocados por invasiones territoriales, pérdida de identidad cultural, cambio climático.
- Gestionar recursos necesarios para fortalecer el empoderamiento biocultural.

LLAMADOS A ACTORES EXTERNOS

- Promover iniciativas que fomenten acciones de conservación de la biodiversidad.
- Impulsar a la voluntad política para el reconocimiento de procedimientos locales de CLPI dentro de políticas nacionales.
- Además del apoyo de FEDECOVERA, la Universidad de Greenwich y la ARNPG, instar a que otras instituciones gubernamentales y no gubernamentales, que respeten los protocolos bioculturales.
- Fortalecer la gobernanza de las cooperativas para la conservación de la biodiversidad, los conocimientos y las practicas ancestrales con el fin de garantizar los derechos consuetudinario.

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- 10 Cooperativas de Productores Q'eqchi' de Alta Verapaz.

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NATURALES

8

PROTOCOLOS
BIOCULTURALES
EN GUATEMALA

1

¿QUÉ SON LOS PROTOCOLOS BIOCULTURALES

Son instrumentos para el desarrollo local liderados por comunidades y/u organizaciones para resolver sus necesidades y ejercer sus derechos.

Sirven para quiénes quieran hacer uso y aprovechamiento de los recursos naturales, la biodiversidad y el conocimiento asociado y para que actores internos y externos conozcan las reglas de uso, manejo, conservación y protección acordadas por las comunidades y otras organizaciones locales.

Los protocolos bioculturales son una herramienta importante para que las comunidades y organizaciones locales determinen y comuniquen sus propios planes y prioridades a favor del respeto y el apoyo adecuado a su patrimonio biocultural.

¿POR QUÉ LOS PROTOCOLOS BIOCULTURALES SON NECESARIOS PARA CONCILIAR EL PATRIMONIO CULTURAL Y LA CONSERVACIÓN DE LA BIODIVERSIDAD?

- Fortalecen los procesos de gobernanza, planificación local, y la distribución justa y equitativa de los beneficios.
- Evitan el acceso ilegal a los recursos naturales y conocimientos tradicionales.
- Reconocen los derechos consuetudinarios y el rol de las Comunidades Indígenas y organizaciones locales en la conservación de la biodiversidad con base en sus costumbres, creencias, conocimientos y practicas tradicionales.
- Facilitan el diálogo de las comunidades Indígenas y las organizaciones locales entre investigadores, empresas, gobierno y otros actores en relación con el acceso a la biodiversidad y los conocimientos tradicionales.

CONTENIDO DE LOS PROTOCOLOS BIOCULTURALES

1. Autodefinición del grupo y sus procesos de liderazgo y toma de decisiones.
2. Leyes consuetudinarias, modos de vida bioculturales y comprensión espiritual de la naturaleza.
3. Registro de la biodiversidad local y los conocimientos asociados.
4. Reglas de uso, manejo, conservación y protección de los recursos naturales y el conocimiento tradicional asociado.
5. Procedimiento para obtener el consentimiento libre, previo e informado de la cooperativa.
6. Desafíos locales.
7. Derechos de las cooperativas según el derecho nacional e internacional.
8. Un llamado a los diversos actores para el respeto de sus leyes consuetudinarias, su protocolo cooperativo y una declaración de los diversos tipos de asistencia que necesita la cooperativa.

PROCESO PARA EL CONSENTIMIENTO LIBRE PREVIO E INFORMADO

- **Externos:** Bajo previa aprobación del Consejo de Administración de turno como máxima autoridad en un proceso transparente y voluntario.
- **Asociados/as:** Derechos y obligaciones regidos por estatutos de las cooperativas y el espíritu del cooperativismo.

MARCO LEGAL NACIONAL E INTERNACIONAL

Existen marcos jurídicos internacionales y nacionales aplicables especialmente a pueblos y comunidades indígenas, que reconocen sus derechos relacionados con la gestión, el manejo y participación en la distribución de beneficios por el uso de los recursos naturales en su territorio, biodiversidad, componentes, así como de los conocimientos y practicas tradicionales asociados. En conjunto, estos instrumentos dan sustento y base legal, entre otros, para desarrollar los protocolos bioculturales.

- Constitución Política de la República de Guatemala.
- Convenio 169 de Organización Internacional del Trabajo (OIT)
- Ley General de Cooperativas en Guatemala, decreto 82-78
- Ley de Consejos de Desarrollo Urbano y Rural, decreto 11-2002
- Convenio sobre la Diversidad Biológica (CDB)
- Protocolo de Nagoya
- Política Nacional de Diversidad Biológica

CO-CREACIÓN DE PROTOCOLOS BIOCULTURALES EN GUATEMALA

Guatemala es un país multiétnico, multilingüe y pluricultural. El censo poblacional del año 2018 refleja que el 43.75% de la población del país se autoidentifican como Indígena de los pueblos Mayas, Garífunas, Xincas y Afrodescendientes; siendo Alta Verapaz uno de los departamentos con el 93% de Indígenas.

Alta Verapaz es un departamento ubicado al norte del país conocido como la Verde Verapaz, por sus montañas, valles y ríos, donde habitan principalmente Indígenas maya Q'eqchi' y Poqomchi', con muchas creencias y prácticas ancestrales relacionadas con la Tierra, los Ancestros y la Naturaleza. En el departamento habitan pequeños productores de cardamomo, café, té, pimienta, cacao, cúrcuma y madera sostenible organizados en cooperativas.

LAS COOPERATIVAS DE LAS VERAPACES

En los departamentos de Alta y Baja Verapaz existen 42 cooperativas de primer nivel integradas al sistema de la Federación de Cooperativas de las Verapaces, Responsabilidad Limitada – FEDECOVERA, R.L.-, cooperativa de segundo nivel, que a lo largo de su historia ha desarrollado un modelo de negocios integrado que respeta la naturaleza y promueve prácticas agrícolas sostenibles, orgánicas y tradicionales.

FEDECOVERA, R.L. fortalece a las cooperativas a través de la asistencia técnica, capacitaciones en procesos organizativos, administrativos, productivos y comerciales orientadas a las 07 cadenas de valor implementadas bajo sistemas de producción agroforestal, producción limpia y orgánica, con criterios y estándares de las certificaciones (NOP (Nacional Organic Program), EOS (R EC 834/2,007 & 889/2008), JAS, BIO SUISSE), Comercio Justo (FAIRTRADE), Manejo Forestal y Cadena de Custodia (FSC), y Certificado Orgánico Regenerativo -ROC-.

LOS PROTOCOLOS BIOCULTURALES

En el marco del proyecto "Paisajes Bioculturales Indígenas para los Medios de Vida y la Conectividad en Verapaces, Guatemala", se ha impulsado la elaboración de los primeros protocolos bioculturales en Guatemala, en 10 cooperativas ubicadas en el municipio de San Antonio Senahú, del departamento de Alta Verapaz, Guatemala.

1. Cooperativa Agrícola Integral Santa María San Marcos, R. L.
2. Cooperativa Integral Agrícola Concepción Secuachil, R. L.
3. Cooperativa Integral Agrícola Actelá, R. L.

4. Cooperativa Integral Agrícola La Nubes, R. L.
5. Cooperativa Integral Agrícola Vista al Valle, R. L.
6. Cooperativa Agrícola Integral Santo Domingo, R. L.
7. Cooperativa Agrícola Integral Santa Mónica, R. L.
8. Cooperativa Agrícola Integral Santa Rosita, R. L.
9. Cooperativa Integral Agrícola Ruinas Mayas Chijolom, R. L.
10. Cooperativa Integral Agrícola Camelias, R. L.

El contenido de los protocolos, como su formato, fue decidido por las cooperativas, aunque la estructura es la misma. Es importante resaltar que el acceso a los protocolos está restringido a externos y la difusión de sus partes debe hacerse con el consentimiento y la participación de los miembros de las cooperativas. Las cooperativas son organizaciones democráticas, autónomas e independientes regidas a través de sus estatutos y dirigidas por sus asociados y asociadas.

La confidencialidad es importante para que las cooperativas puedan mantener su autoridad sobre su patrimonio intelectual y cultural, para que sus creencias sagradas sean respetadas, y para que los protocolos sean efectivos y bien interpretados. Los aspectos de estos que si es importante difundir externamente incluyen los desafíos identificados, los procedimientos locales para garantizar el Consentimiento Libre Previo e Informado -CLPI-, y los llamados a actores externos.

Las cooperativas comparten las mismas características, y formas de organización. La toma de decisiones y consultas de externos, son canalizadas y analizadas a través de la Junta Directiva y si el nivel de complejidad de la toma de decisiones es alto son elevadas a la Asamblea General de asociados y asociadas para su análisis, discusión y aprobación.

METODOLOGÍA

Se desarrolló una guía metodológica para acompañar a las cooperativas en la elaboración participativa de los protocolos bioculturales, a través de un proceso consultivo con los asociados hombres, mujeres y jóvenes, productores de café y cardamomo con agroforestería integrados al sistema de FEDECOVERA, R.L.

Cada protocolo describe y documenta los valores culturales y espirituales asociados a la biodiversidad local y las leyes consuetudinarias relacionadas con sus conocimientos y practicas tradicionales, respeto y uso de los recursos naturales.

Con técnicas apropiadas, directrices claras y sistemáticas, las cooperativas desarrollaron de forma autónoma procesos de recopilación, sistematización y análisis de información. Sumado a sus formas de organización y difusión de conocimientos; estos procesos dieron como resultado protocolos acordes con sus realidades territoriales y necesidades colectivas.

PRINCIPIOS DE LOS PROTOCOLOS BIOCULTURALES

- **Liderados localmente:** Centrados en intereses y prioridades locales.
- **Autogestionados:** Cooperativas como responsable de gestionar el protocolo.
- **Colectivos:** Fundamentados en derechos colectivos.
- **Participativos:** Elaborados por grupos representativos de las cooperativas.
- **Socializados:** Acceso a sus partes es controlado por cada cooperativa.
- **Flexibles:** Adaptados a intereses y necesidades específicas de cada cooperativa.
- **Legítimos:** Basados en normas y reglas internas aprobados por asamblea.