Conceptual and Methodological Framework for Evaluating The Contribution of Collective Action to Biodiversity Conservation (Summary)

Plurinational State of Bolivia

Bolivian proposal to the CBD regarding decision XI/4, paragraph 23:

"The Conference of the Parties requested the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention, at its fifth meeting, to further review the preliminary reporting framework and baseline information for each of the targets, including the role of collective action, including by indigenous and local communities, and non-market-based approaches to achieving the objectives of the Convention; and requested the Executive Secretary to prepare for this review, based on information received from Parties on the application of the preliminary reporting framework and on funding needs, gaps and priorities".

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Cover: Indigenous people deharing the vicuña wool as part of the sustainable management of vicuña (Vicugna vicugna). © D. Maydana

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CONCEPTUAL AND METHODOLOGICAL FRAMEWORK FOR EVALUATING THE CONTRIBUTION OF COLLECTIVE ACTION TO BIODIVERSITY CONSERVATION

This section reproduces, as submitted by the Government of Bolivia, the summary of a conceptual and methodological framework to assess the contribution of collective action and local resource users, including indigenous and rural communities, to the conservation of biodiversity. It is a synthesized version of the full report[1] "Conceptual and Methodological Framework for Evaluating the Contribution of Collective Action to Biodiversity Conservation" contained in document UNEP/CBD/COP/12/INF.**.

The summary is divided into three main sections: (1) Justification; (2) Theoretical Rationale, and (3) Proposed Methodology: Collective Action in Socio-Ecological Systems. The proposed methodology in turn, consists of three modules: (a) A geospatial modelling approach to estimate the area of terrestrial ecosystems protected by local people; (b) An institutional analysis module that complements the geospatial analysis and includes a field-based component to characterize institutional arrangements that affect efforts to protect biodiversity, and (3) An ecological-assessment module that outlines field-based protocols and sampling to validate the geospatial model.

At the foot of majestic Sajama Mountain. Indigenous people making use and sustainable management of wild species - Vicuña (Vicugna vicugna). Bolivian Highlands. © D. Maydana

POLICY RELEVANCE

The policy relevance of the framework proposed here rests on resolution XI/4, paragraph 23 taken during COP 11 of the Convention on Biological Diversity, which requested the development of an approach to assess the contribution of indigenous peoples and local communities' collective action to the conservation of biodiversity. Paragraph 23 states:

> "Requests the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention, at its fifth meeting, to further review the preliminary reporting framework and baseline information for each of the targets, including the role of collective action, including by indigenous and local communities, and non-market-based approaches to achieving the objectives of the Convention; and requests the Executive Secretary to prepare for this review, based on information received from Parties on the application of the preliminary reporting framework and on funding needs, gaps and priorities;"

Following this statement in resolution XI/4 and the guidelines for the Fifth National Reports of the CBD, the proposed conceptual framework and methodology aims at supporting countries to assess and report the contribution of collection action for biodiversity for the implementation of the Strategic Plan for Biodiversity for 2011-2020, including the development of country-specific frameworks for mobilization of financial resources that consider the contribution of indigenous people and local communities to the national strategy for biodiversity conservation. Figure 1 presents an overview of the various components of the proposed framework.

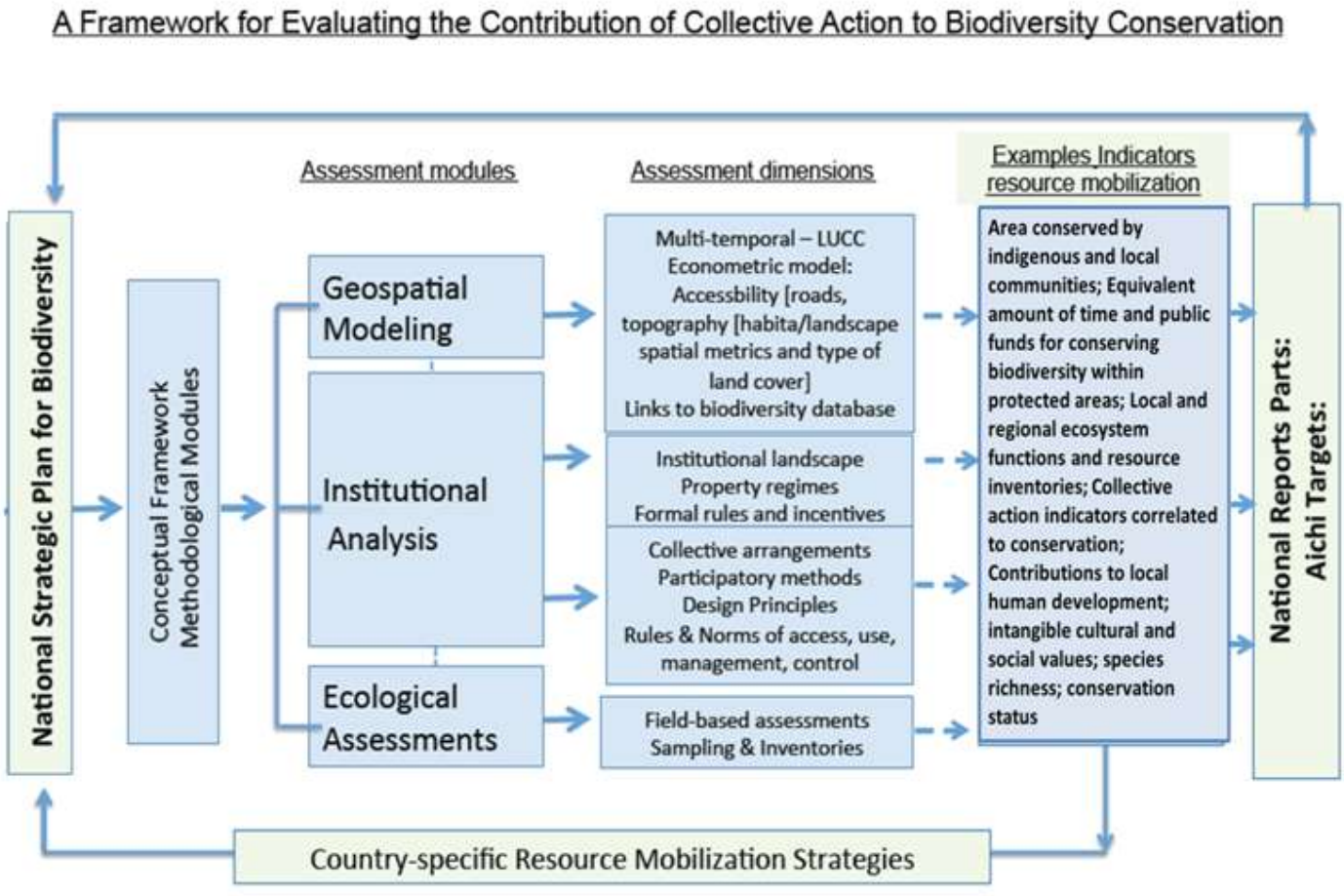

Figure 1. Overall approach and methodology for the assessment of the contribution of collective action to the conservation of biodiversity

THEORETICAL RATIONALE

Pilcomayo river. (Weenhayek culture) Indigenous people making community fishing

One of the most successful efforts to halt biodiversity loss has been the promotion and creation of conservation units and protected areas of different types. The CBD in collaboration with governmental, non-governmental organizations, indigenous peoples and local communities, has been instrumental to developing this approach. Much of this effort has been done directly or indirectly in collaboration with local populations and communities involved in the use and management of natural resources. In tropical areas such as the Amazon, these areas, and particularly areas managed by indigenous and local communities, have been recognized as significant buffers against deforestation and the degradation of ecosystems and biodiversity (Ricketts et al 2010; Soares-Filho et al 2010). There is now significant evidence that indigenous peoples, local communities and resource user groups are central to the effectiveness of protecting biodiversity within and outside of these areas (Cox et al 2010; Castro et al 2003; Brondizio 2008; Andersson et al 2014).

In many cases, however, these communities are overwhelmed by pressures and transformations occurring around them, such as the consequences of extractive and agro-industrial expansion. In this context, it is important to understand the ways in which local resource users organize themselves to respond to external pressures in maintaining biodiversity ecosystem functions. In some cases, these local actions are aimed at protecting a given area or territory, while in others they are organized

to protect specific resources or environmental functions (e.g., water quality). In other cases, the socio-economic realities of local populations can also limit the efforts to conserve biodiversity (Andersson and Gibson, 2007). It is therefore important to recognize the limitations of complete self-regulation and consider how institutions developed at higher levels can contribute, create incentives, and facilitate or undermine local efforts of conservation (Andersson and Ostrom, 2008; Brondizio et al 2009).

The methodology proposed here brings together advances in land change sciences that link - through geospatial analysis - the analysis of environmental change at different scales with the analysis of institutional arrangements that examine the underlying mechanisms of local individual and collective action to protect biodiversity and ecosystems. Figure 2 below illustrates how modules of the proposed methodology will feed into the national reporting system and contribute to the generation of new indicators that are directly relevant for several of the Aichi targets. From this combination of modules different indicators can be generated to evaluate the relationship between collective action and biodiversity conservation, with respect to resource mobilization.

Tarquia National Park. Rubber harvest by the communities. © IAS

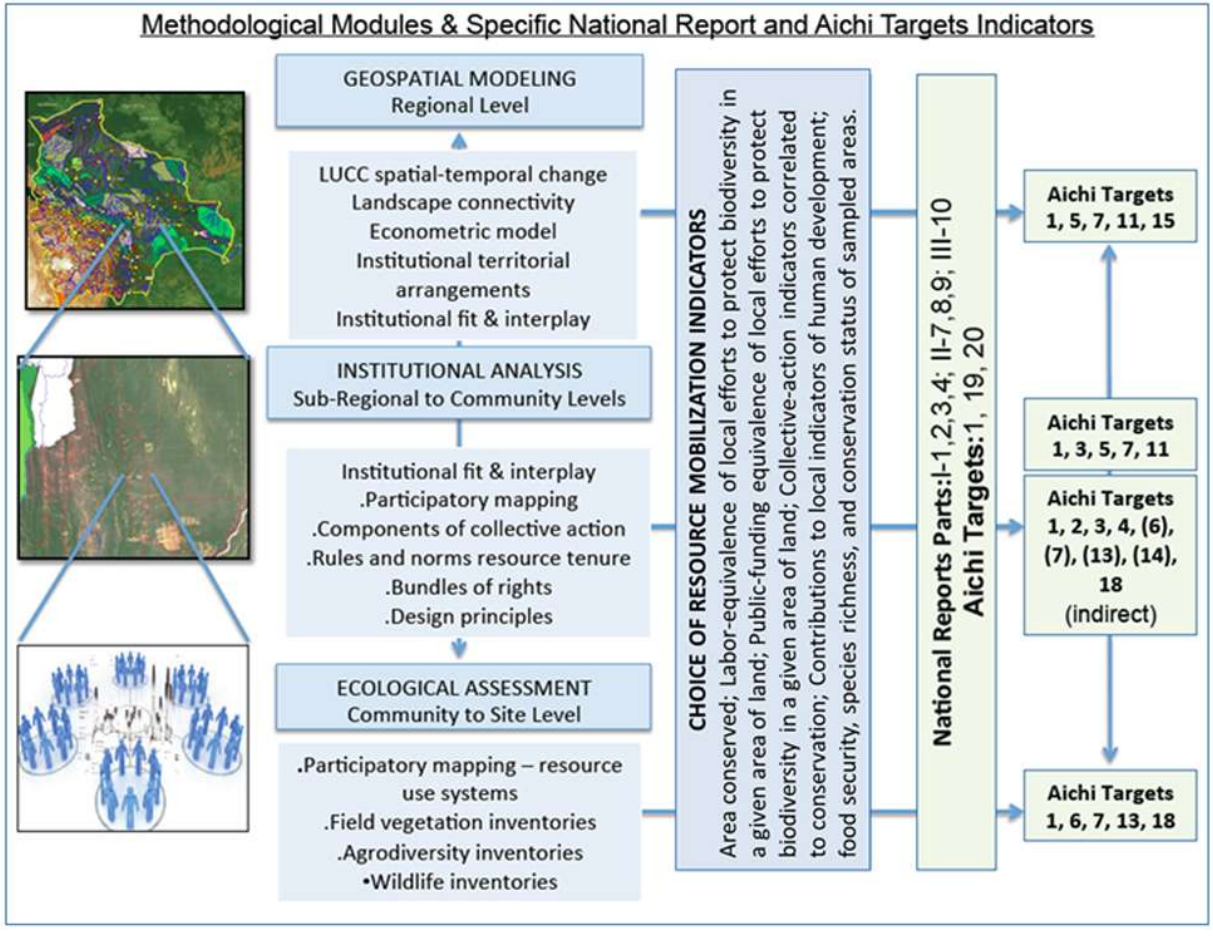

Figure 2. Analytical results linked to possible resource mobilization indicators, National Report questions and specific Aichi targets

PROPOSED METHODOLOGY: COLLECTIVE ACTION IN SOCIO-ECOLOGICAL SYSTEMS [CASES].

The proposed methodology will enable member countries to evaluate and quantify the contribution of local people to biodiversity conservation (see Figure 2 in the main report). These modules could also be adapted for use by local communities and user groups. It consists of three modules: (a) A geospatial modelling approach; (b) An institutional analysis module, and (c) An ecological-assessment module.

The methodological approach discusses one example of the role of collective action in biodiversity conservation and sustainable use of its components, such as forest areas conserved by local communities through collective action. Further work is needed for assessing the role of collective action in other aspects such as water and biodiversity conservation, protection of environmental functions, food security, among others.

The implementation of these modules allow for the generation of ten indicators of resource mobilization, as summarized in Table 1 below, and the methodology relates to 14 of the 20 (see Figure 3 in the main report) Targets. As mentioned previously, this document takes as an example of the forest area conserved by local people through collective action, and some proxy indicators (labor and public funding equivalents) can be developed as necessary. The remaining indicators are indirectly relevant to resource mobilization in that they can help explain why some indigenous and local communities are more successful in protecting biodiversity-indicators that can help create more effective conservation policies.

Table 1: The proposed metrics for quantifying local people's contribution to the conservation of biological diversity.

MODULE	CRITERIA	EXAMPLES OF INDICATORS FOR RESOURCE MOBILIZATION
Geospatial Modelling Module	Local resource users are able to conserve natural resources under increasing pressures from growing population and market opportunities	Example of collective action: Forest area conserved by local communities (km2). Regional environmental functions and resource inventories
Institutional Analysis Module	The active involvement of local resource users in the creation, monitoring and enforcement of rules associated with natural resource use and environmental functions improves the cost-effectiveness of conservation efforts both inside and outside protected areas.	Labour and public-funding equivalents to forest conserved areas. Collective action indicators correlated to conservation Contributions to local Living-well/human wellbeing Intangible cultural and social values Local environmental functions and resource inventories
Ecological Assessment Module	Local protection efforts, individual or collective, improve the condition of the natural resource base.	Resource provisioning and food security Species richness, presence of vulnerable indicator species

A GEOSPATIAL MODELLING APPROACH

The proposed modelling approach for the example of forest areas conserved through collective action assumes that there are three basic reasons that biodiversity may be protected. It is protected because (1) it has been given a formal protected status by a government agency; (2) it is difficult to access and extract resources from, and (3) local resource users take actions to protect the natural resources. The last category of local action can be individually driven (i.e. a landowner who maintains native forest cover for personal reasons), or collectively driven (i.e. a community that communally manages forest for subsistence needs). The goal of the methodology is to carry out analysis at national and subnational levels to identify which of the three mechanisms are at work in any given area where natural resources appear to be in good, stable condition. The modelling approach relies on data that are publicly available in most countries. How is this done in practice?

Bolivian Amazon. Indigenous people making use and sustainable management of wild stands of cacao trees (Theobroma cacao). © MAPZA

The modelling starts by calculating the probability that a given area on the map has natural resources in a relatively stable condition (see Table 3 in the main report). We use a statistical model that uses several causal variables (slope, population, distance to roads, etc.) to predict the main outcome variable (land cover change) (see Figure 4 in the main report for illustration). The model will, in other words, predict whether a given area on the map is likely to be conserved in the absence of action by local people. Having these model predictions for all pixels on the map, we will then be able

to compare the model's prediction with the actual state of the ecosystem (according to the actual land-cover map). The model for the example indicator of forest conserved areas by local communities through collective action is likely to find that most areas that are close to major roads, near large human settlements, and are relatively flat have a greater likelihood of being degraded (not conserved). But we might also find that the model predicts some areas to be degraded while they are actually conserved. Such anomalies may reveal local people's actions because they suggest that although known drivers of environmental degradation are present-making conservation unlikely-the natural resources have somehow been protected. We add up all pixels that fall within the "anomaly" areas within the country-areas that are actually conserved despite being exposed to major outside pressure and this number represents local people's contribution to biodiversity conservation at the national level by.

Titicaca Lake, Bolivia. bolivian highlands
Indigenas people (Aymara culture) making Totora Boat

Bolivian Amazon. Indigenous Woman (Moxeña culture) making a handicraft with wild cotton. © S. Acebey

INSTITUTIONAL ANALYSIS GEOSPATIAL AND FIELD-BASED

Bolivian Amazon. Itenez River. Community planning © F. Cisneros

The institutional analysis module is applied at two subnational levels: Regional and Local (see Figure 5 in the main report). At a regional level, institutional analysis is carried out as part of the geospatial analysis module to understand how land cover change associate with layers containing types of institutional arrangement and property regimes. At this level, layers designating institutional arrangements and property regimes are associated with attribute tables containing data about property systems, population characteristics, and rules of resource access, management, and use. This type of analysis can be extended to sub-regional levels, through a sampling approach, to allow closer examination of rates of land cover change associated with different types of institutional arrangements, property regimes, and populations. At the local level, institutional analysis is carried out through the use a systematic protocol in sampled locations to understand the institutional arrangements associated with specific areas, social and resource user

groups, and/or communities. These areas are identified through a sampling process and the sample size should be adjusted to the availability of available resources and desired level of precision of the data. And it is in these areas that regional and sub-regional analysis will be carried out for more in-depth investigation of why some areas are better conserved than others. At this level, institutional analysis is applied to understand the interaction of two dimensions of collective action, i.e., at the level of a given area or territory and at the level of a specific natural resource. This level of work involves a combination of participatory mapping and community level questionnaires with the goal of understanding how different forms of institutional arrangement and collective action relate to the management and use of different areas/territories and resources (see Figure 6 in the main report). The institutional analysis protocol involves eight structuring dimensions or components of collective action, which are used to examine the underlying elements of collective action at both the level of a given territory and at the level of a user group and/or community.

These eight components include: 1.1 Physical/geographic boundaries; 1.2 Social boundaries; 2. Legitimacy of institutions and right to organize; 3. Congruency between rules of resource appropriation and local conditions; 4. Collective choice arrangements; 5. Control and monitoring of resource and territory; 6. Sanctions; 7. Mechanisms of conflict resolution; 8. Degree of nesting to higher-level institutions. The institutional analysis will allow for field-based adjustments (validation) of the estimates of areas conserved by local people produced by the geospatial model in the previous stage.

ECOLOGICAL ASSESSMENT

While the modules presented above build understanding of the drivers of land cover, landscape structure, habitat (e.g., integrity and connectivity) and biodiversity change, the ecological assessment module measures these changes themselves. Although satellite imagery is used as a basis for identifying potential areas conserved by collective action, it is necessary to engage in more detailed assessments to determine whether lands are truly protected, or are 'empty forests', selectively logged of valuable trees and hunted free of large animals. Assessments can be made across ecosystems, or target particular species of interest, including plants and wildlife important to the local economy. As mentioned, participatory mapping allows for spatial understanding of institutional arrangements associated with collective action at the level of landscapes and communities. It also serves as a basis for defining resource use areas and, thus the selection of sites for ecological assessments and inventories. Ecological assessments of plant and animal resources can be developed at different levels of detail, from systematic inventories providing specific information about density, frequency, and dominance of key species in a given area, to general conditions of the vegetation and fauna. This module presents field protocols for three types of assessments: (1) systematic surveys; (2) rapid assessments, and (3) targeted interviews. The choice of level of detail will influence the types of indicators [monetary and non-monetary] that can be calculated. We outline the operational and analytical trade-offs associated with different choices of methods and their implications for the development of different indicators.

Bolivian Amazon. Itenez River. Indigenous people making use and sustainable management of river turtle (Podocnemis expansa).© D. Alarcón/WWF