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A systematic review protocol

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1 Background

More than half of the earth's lands are collectively held by communities or indigenous populations, yet only a minor portion (an estimated one-fifth) is formally recognized in national legislation (Pearce 2016). In many settings the absence of statutory recognition of land rights contributes to actual or potential tenure insecurity (Lawry et al. 2016). Importantly, many of these lands are situated in forested regions across the global tropics, and researchers have estimated that those tropical forests already under formal title and held by communities account for nearly one-quarter of above-ground carbon storage (Pearce 2016). Additionally, global initiatives such as the Sustainable Development Goals (Goals 1 & 15) and the Paris Climate Agreement (Article 4.1)¹ call for recognition of indigenous and community land rights as a means of achieving sustainable development, conservation and climate goals, underscoring a growing consensus around the importance of secure tenure to improving both environmental conditions and human well-being.

Some researchers, policy makers and indigenous rights advocates argue that there are social and cultural characteristics associated with 'indigeneity' that contribute to healthier, more sustainable ecological conditions in areas under indigenous community control. It is further suggested that commensurate socio-ecological interactions are absent in areas held by non-indigenous communities (Barrera-Bassols et al. 2006; Colchester 2000). Yet we risk oversimplifying a complex relationship if we assume a strong linear, positive relationship between a set of characteristics that imply "greater" indigeneity and a set of measures indicating healthier socio-ecological conditions. Some literature has explored these cause and effect assumptions, providing a more nuanced understanding of how indigeneity is associated with environmental conservation successes. Lu Holt (2005) argued many "protectionist" conservation practitioners mistakenly assume cultural conditions and values within indigenous communities are inherently aligned with biodiversity conservation goals. Hope (2017) also cautioned against simplifying the relationship between indigeneity and conservation, suggesting contemporary strengthening or formalization of indigenous land tenure does not necessarily imply a specific alignment with environmental conservation. Lu Holt (2005) extends this argument in an ethnographic study of the Huaorani Indians of the northern Ecuadorian Amazon to illustrate how key contextual factors (i.e. population density, market access and integration) further influence assumptions about the relationship between indigeneity and ecosystem health or ecological conditions. Thus, this tendency toward "universals" when discussing indigenous communities restricts us from exploring the more plausible reality of indigenous communities and others as existing within a sphere of indigeneity that is neither a closed system nor static (Radcliffe 2015).

1.1 What do we mean by "indigeneity"?

Radcliffe (2015) suggests that the concept of *indigeneity* "attends to the social, cultural, economic, political, institutional and epistemic processes through which the meaning of being indigenous in a particular time is constructed" (Radcliffe 2015: 1). Others note that indigeneity, implies a population's distinct set of knowledge, beliefs, interpretations and practices about the natural world, referred to as

¹ With the passage of the Paris Climate Agreement, however, there was discontent among indigenous groups and advocacy organizations that specific targets connected to indigenous and community rights were not included in the legally binding portion of the agreement. Analysis of intended nationally determined contributions submissions also indicated that only a small proportion of the tropical countries indicated that formal recognition of land rights for indigenous groups would be priority. (http://rightsandresources.org/wp-content/uploads/2016/06/Indigenous-Peoples-and-Local-Community-Tenure-in-the-INDCs_RRI_April-2016_Summary.pdf)

‘cosmologies’. We adopt this overall lens of indigeneity (a contraction of ‘indigenous’ and ‘identity’) to examine a wide array of community lands that extend beyond those that currently hold formal or statutory recognition as indigenous lands. We assert that this is an important approach particularly for regions such as Africa and parts of Asia, where the actual label of ‘indigenous’ is not as widely utilized as in Latin America. Embracing the heterogeneity that exists among and between even individual indigenous groups, we present in this systematic review a characterization of indigeneity that incorporates multiple characteristics, including those adopted or utilized by international organizations, including the International Labour Organisation, the World Conservation Union (IUCN), the United States Agency for International Development (USAID), and the United Nations. We assume that of primary importance among these characteristics is a group’s *self-identification* as ‘indigenous’. Six other characteristics are also included in the table (Table 1) and graphic below (Figure 1), as compiled and cross-referenced from the various organizations mentioned.

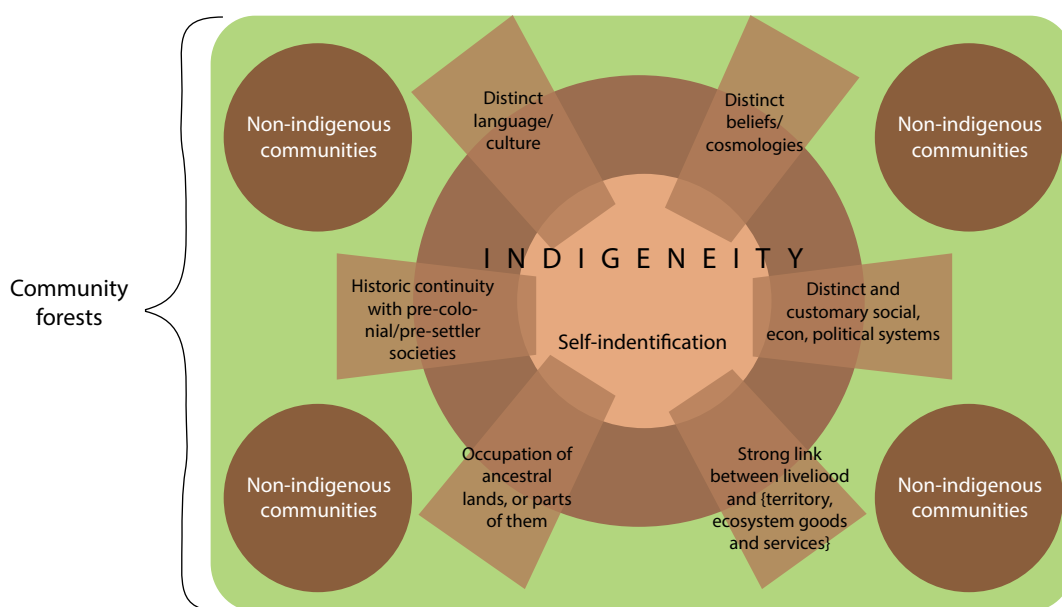


Figure 1. Conceptualization of indigeneity as positioned within context of this review

Table 1. Characteristics of indigeneity^{a,b}

- Self-identification as ‘indigenous’
- Distinct language and culture
- Distinct beliefs or cosmologies
- Distinct and customary social, economic and political conditions or systems
- Strong link between livelihoods and territory, ecosystem goods and services
- Occupation of ancestral lands, or portions of them
- Historic continuity with pre-colonial/pre-settler societies

a International Labour Organisation, 1989, Convention 169 on Indigenous and Tribal Peoples in Independent Countries, available at http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169

b http://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf

Importantly, we do not suggest that these characteristics (Table 1) represent an exhaustive or comprehensive list of what it means to be ‘indigenous’; nor is this list to be interpreted as a set of criteria that a population must fulfill to be considered ‘indigenous’. Rather, as noted above, these characteristics are among the more regularly cited by international organizations and indigenous alliances when working in dialog on international policy agreements and human rights issues.

1.2 Breaking apart the broad category of community lands

Policy literature on natural resource management and conservation often conflates indigenous and non-indigenous community landholdings in the single category of community land tenure. This formulation obfuscates the rich diversity within and among defined communities and their lands, and fails to account for the diverse ways in which indigeneity, alongside other factors, links social well-being with the health of the ecosystems on which communities rely for their livelihoods (Hope 2017). To better elucidate the diversity of relationships, we will conceptualize indigeneity as existing within a non-static sphere, rather than as one side of an indigenous/non-indigenous dichotomy. We will also consider how indigeneity interacts specifically with land tenure, identifying in our review of studies whether community lands are formally (or statutorily) recognized, what tenure form(s) is/are present, and whether studies indicate that statutory rights reflect customary or locally upheld rights and norms. Considering the broad tenure category of ‘community lands’, we hypothesize that indigeneity contributes to improved socio-ecological conditions once land tenure is considered. We expect that land tenure, among other contextual factors, is the factor most likely to influence the relationship between indigenous/non-indigenous communities and their forests. When tenure conditions, encompassing both the norms and rights, as well as the overall tenure security, reflect that which is locally established and upheld in community forests, we anticipate that land tenure will have a positive effect on communities and forest conditions. When there is misalignment or a gap in tenure conditions between that which is statutorily recognized (*de jure*) and that which is locally established, then we expect land tenure to represent a disruptive factor, or have a negative influence on communities and forest conditions.

Non-indigenous communities may be defined as those that do not subscribe to shared cosmologies about society and nature that contribute to the creation and enforcement of local norms (including tenure rules) that may favor more sustainable land use practices. Thus, we think a more discerning characterization of communities as situated within or outside of a sphere of indigeneity (Figure 1) will help isolate contexts where indigeneity remains a characteristic more likely than not to contribute to healthy socio-ecological conditions and effective local governance of resource use. This characterization will in turn allow a better understanding of the role that other contextual factors, especially statutory recognition of customary rights, play in shaping socio-ecological outcomes.

1.3 Research & policy landscape

Other systematic reviews have focused on assessing the impact of property regimes across several ecological production systems (e.g. Ojanen et al. 2017 with forests, rangelands, and fisheries), but tend to aggregate results according to the large grouping of “indigenous and community lands”. To our knowledge, no systematic review has yet examined such community forests using a typology of indigeneity and tenure characteristics to examine their relative impact on socio-ecological conditions.

We see this review as especially timely given the current global push for statutory recognition of community landholdings (e.g., as targeted in the Sustainable Development Goals (SDGs)) and the promotion of human rights-based approaches in strategies to address climate change (e.g., in

the preamble of the Paris Agreement). There is also a growing recognition of the need to protect and conserve the knowledge and rights of indigenous people and local communities, and we see this reflected in social safeguards within REDD+ and the Green Climate Fund. The results from this review can help decision makers translate global targets into more context-specific and evidence-based strategies for collaboration with traditional communities in their natural resource management practices.

2 Aims and objectives

The primary objective of this review is to answer the broad question, “How does indigeneity influence socio-ecological conditions on community forested lands?” We will unpack the term ‘indigenous and community lands’ by using a sphere of indigeneity to better characterize the relationships between community tenure in forested regions and measures of forest conditions and human well-being.

2.1 Specific research questions

Specifically, we will investigate the following questions:

1. How does the indigeneity of forest-dependent or forest-dwelling communities correlate with socio-ecological conditions on those forested lands?
2. How do tenure conditions further mediate or interact with characteristics of indigeneity to influence socio-ecological outcomes/conditions?

3 Methods

For this review and our search strategy, we adopt a Sample–Phenomenon of interest–Design–Evaluation–Research (SPIDER) framework (Cooke et al. 2012). From preliminary searches, and comparison with a related review effort, our studies of interest for this review use methodologies that span quantitative, qualitative, mixed-method and participatory approaches. As such, the SPIDER framework has been recommended as more appropriate for our review questions of interest, as it can more efficiently and flexibly target such studies (Cooke et al. 2012).

Context will also be applied to this review, including characteristics of formal and informal land governance, as well as political economy aspects that influence the security of community landholdings and decisions regarding land use and management (Robinson et al., 2017). These will be cross-referenced with mapped contextual factors (e.g. land use, climatic conditions, socioeconomic and demographic variables) already enabled within the Global Collaboration Engine (GLOBE) assessment tool, an online mapping platform that allows researchers to explore, connect and integrate local case studies with global geospatial datasets, with the primary goal of better understanding land-change processes. For researchers and those who contribute studies, GLOBE facilitates two types of analysis: (1) similarity analysis, where users can assess how similar individual case study sites are to other areas across the earth, and (2) representativeness analysis, where researchers can assess to what degree a set of study sites represent an unbiased sample (GLOBE 2012).

3.1 Application of the SPIDER framework

Sample: We focus on those populations (e.g. villages, groups within villages or settlements) located within forest-dominated areas (across tropical, temperate and boreal forest biomes). For this review, we focus on those forested lands that are held and managed by communities with either *de jure* or *de facto* tenure status.

Phenomenon of interest: For those forested lands held or managed by communities, our phenomenon of interest is the variability in characteristics of indigeneity exhibited by those communities using and managing the forests to meet at least some part of their community livelihood needs. Often such communities are referred to across the literature as ‘forest-dwelling’ or ‘forest-dependent’ peoples.

Design: We will include those studies that use methods for data collection and analysis that span qualitative, quantitative and participatory techniques, including questionnaires, surveys, interviews, focus groups, ethnographies, case studies, observations, inventories, rapid rural appraisals, participatory mapping/GIS, geospatial analysis and impact evaluations.

Evaluation: Our *primary* evaluation or measure of interest is tied to the forest conditions and forest dynamics documented in each study. Since we are including quantitative, qualitative and mixed-methods research in this review, we anticipate that the approaches to measurement and characterization of forest conditions and dynamics will vary widely across our study set. We will include those studies that assess forest condition under indigenous and non-indigenous tenures. In addition to documenting the methods and results of that assessment, we will code results into positive or negative outcomes for forests, following similar guidelines to Robinson et al. (2014): (1) positive outcomes referring to slowed deforestation, no forest change or forest recovery and (0) negative outcomes for increased rates of forest loss or overall deforestation (Robinson et al. 2014). that either compare community forested lands from a similar setting (spatial comparison) or compare documented changes in forest conditions on the same lands (temporal comparison).

Our other evaluation measures of interest center on land tenure and human well-being conditions. Our inclusion of tenure conditions allows us to explore how such factors mediate this relationship or otherwise influence socio-ecological outcomes. We will document both the *de jure* and *de facto* tenure conditions, as indicated by study authors, including where possible for each (*de jure/de facto*): tenure form (e.g. private, public, communal, as referenced in Robinson et al. 2014), any indication of overall tenure security or change in tenure security, and specific indication of any individual right within the bundle of rights with respect to forests (e.g. access, withdrawal, management, duration, exclusion, alienation, due process and compensation). For human well-being conditions, we will document whether studies indicate a change in an individual or composite metric for human well-being, following those categories of measures utilized by Bottrill et al. (2014).

Research type: For this review, we will consider quantitative, qualitative, and mixed-methods studies.

Table 2. Overview of the SPIDER framework

Sample	Phenomenon of interest	Design	Evaluation	Research type
Community forests	Communities of forest-dwelling or forest-dependent peoples as situated within and outside the sphere of indigeneity	Fieldwork approaches and analysis techniques include: questionnaires, surveys, interviews, focus groups, ethnographies, case studies, observation, mapping, evaluation, and participatory techniques	Primary: forest conditions and dynamics Our focus here will be on forest ecosystems globally, following a sub-categorization of the three main forest biomes (tropical, temperate and boreal). Additional: Land tenure and human well-being conditions	<ul style="list-style-type: none"> • Quantitative: Quasi-experimental • Quantitative: Other • Qualitative • Mixed methods

3.2 Literature search

Our overall search strategy is oriented toward obtaining a comprehensive body of evidence on the subject of indigeneity and socio-ecological conditions in community forests. All searches will be conducted in the English language, and we will store all bibliographic references in the citation software EndNote (X8). We will restrict our study set for this review to articles written in English, but will set aside those non-English studies that meet our inclusion criteria at the title/abstract review level. A full set of iterations of our search strings are included in Appendix A. These were reviewed early on by our study team, and vetted with members of the Tenure Security & Conservation Working Group.²

The publication databases that we will search for relevant materials are:

- Scopus
- ProQuest (EBSCO)
- Web of Science (also known as Web of Knowledge).

² The Land Tenure Security and Conservation Working Group was formed in 2016, with funding from The Nature Conservancy. The group is led by study co-authors MBH, AK, YM, and BER. There are more than fifteen active members of the working group, including representatives from academic/research institutes, NGOs, and multi-lateral organizations. The most recent publication from the group, titled “Incorporating Land Tenure Security into Conservation” was published in the journal *Conservation Letters* in July 2017.

Our search strategy is designed to be comprehensive. During the course of our protocol development, our team held ongoing discussions with a research group from USAID, who are developing a literature review on conservation outcomes and changes in ecological conditions on indigenous lands and indigenous-managed resource areas across all ecosystem types. Once our own database searches are complete, we will cross-reference our full extraction set of studies with those reviewed by the USAID team. We will also perform backward and forward citation chasing, initially through the Web of Science publication database.

3.2.1 Addressing potential geographic bias

Following our initial searches, we will use the joint Global Land Project and University of Maryland, Baltimore County GLOBE (2012), as referenced earlier, to assess representativeness of the set of studies that we have identified for inclusion. We will also cross-reference this with the LandMark map's classification of percentage of lands held formally or informally by indigenous peoples and communities to see whether the geographic distribution of our studies reflects the relative percentage of lands in this tenure category (LandMark 2016). If any geographical bias is revealed, we will conduct backward and forward citation chasing using Google Scholar, to access additional potential sources for inclusion in the review. The existence of geographic bias in our study set could be due to our language restriction for this specific review. We will then include a summary map of this non-English language set of studies in the final review document. Any English language references found during our geographic bias assessment will be assessed using the same methodology used for our overall search.

3.3 Screening

We will use a three-phase inclusion methodology, screening for inclusion at the levels of title, abstract and full texts. Initially, search returns will be screened by title to eliminate spurious results. Initial searches indicate that such instances are likely tied to studies of non-human animal communities and their use of the forest. Search returns will then be assessed for inclusion at the abstract level using broad inclusion criteria. Finally, each publication will be assessed for fine inclusion criteria immediately prior to data extraction.

3.3.1 Relevant types of study design

We will review and categorize studies according to the methods used for data collection and analysis. Search returns that only address theoretical topics, modeling efforts, position or commentary papers will not be considered. Other systematic or literature reviews will be reviewed in detail by team members to identify additional individual studies for inclusion. We have chosen in this review to include only those studies published after 1990, for two reasons: (1) Such studies are likely to incorporate measures of forest conditions that are derived from remotely sensed data sources (in addition to, or in place of plot-level conditions),³ and (2) are more likely to capture evaluations of forest, tenure and human well-being conditions that are current.

3.3.2 Broad inclusion criteria (abstract level)

- Publication criteria
Peer-reviewed scholarly materials, English language and published after 1990.

³ Such sources are not inherently more accurate than plot-level measurements, but rather can be compared with external datasets for validation purposes.

- Relevant sample
Must address at least one distinct population or subpopulation holding a distinct tenure arrangement tied to a forest.
- Relevant evaluation (forests)
Must include some reference to a qualitative or quantitative measure of change in forest condition.

3.3.3 Fine inclusion criteria (full document level)

- Relevant sample
Must address at least one distinct population or subpopulation holding a distinct tenure arrangement tied to a forest. Population (or subpopulation) indigeneity (or non-indigeneity) must be identifiable as “yes” or “no” on at least one metric in our list of characteristics (Table 1).
- Relevant evaluation (forests)
The geographic extent of the forest must be identifiable. The paper must include a qualitative or quantitative measure of forest condition or forest change associated with the study area, and be tied to an explicit tenure arrangement associated with community managed or community-held forested lands. As a secondary supplemental forest outcome metric, we will use the Hansen Global Forest Watch database (Hansen et al. 2013) to assess forest conditions and change up to 2015, as tied to the area under analysis for each study.
- Relevant evaluation (tenure)
Not required, but desired: Tenure arrangements are explicitly discussed and identified.
- Relevant outcomes (human-well-being)
Not required, but desired: The study reports on one or more human well-being outcomes or conditions (qualitatively or quantitatively), defined as any of the following (Bottrill et al. 2014):
 - Economic living standards
 - Material living standards
 - Governance and empowerment
 - Social relations
 - Education
 - Security and safety
 - Subjective well-being
 - Culture/spirituality
 - Health
 - Freedom of choice/action

3.4 Kappa test(s) to check consistency of screening decisions

Before screening begins, inter-rater agreement will be tested by taking a subsample of the first 30 search returns in Scopus (as sorted by relevance). Each reviewer will independently assess that subsample for inclusion at the title level and then again at the abstract level. Reviewer agreement will be assessed using Fleiss’ kappa in place of Cohen’s kappa as more than two reviewers will be involved in assessment (Ojanen et al. 2014). If a kappa statistic of <0.70 is found, then inclusion criteria will be reassessed and clarified among the reviewers, and the kappa test will be repeated with a different randomized sample.

3.5 Quality assessment of the selected studies

In the systemic review and analysis of evidence, it is important to assess the quality of the studies selected for extraction to support the validity of the conclusions made within the review. For all studies that reach full-text screening, we will record information on research design and methodological approach. With our anticipated set of mixed studies, we will use guidance from the Mixed-Methods Appraisal Tool⁴ (MMAT; Pluye & Hong 2014). These include two general screening questions that are assessed for all studies, followed by separate sets of questions for qualitative, quantitative, and mixed-method studies. The screening questions for quality, as taken directly from the MMAT criteria template, are as follows (Pluye et al. 2011: 2):

- “1. Are there clear qualitative or quantitative research questions (or objectives), or a clear mixed-methods question (or objective)? (Yes/No/Can’t tell)
2. Do the collected data allow for addressing the research question or objective? (Yes/No/Can’t tell)”

Studies that are assessed as “No” or “Can’t tell” for these above questions will be set aside from the full review. The remaining quality assessment questions and criteria, are taken directly from the MMAT criteria framework (Pluye et al. 2011), selected specifically for our review. All responses to these questions will be logged as Yes/No/Can’t tell, with comments included. Any composite score for quality assessment would consider a “Yes” response as carrying a value of 1, with all else valued at 0, and assessed separately according to the type of research design.

Qualitative:

-
- 1.1. Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)?

 - 1.2. Is the process for analyzing qualitative data relevant to address the research question (objective)?

 - 1.3. Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected?

 - 1.4. Is appropriate consideration given to how findings relate to researchers’ influence, e.g., through their interactions with participants?

Quantitative descriptive:

-
- 4.1. Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed-methods question)?

 - 4.2. Is the sample representative of the population under study?

 - 4.3. Are measurements appropriate (clear origin, or validity known, or standard instrument)?

 - 4.4. (Where relevant): Is there an acceptable response rate (60% or above)?

4 Mixed Methods Appraisal Tool, <http://toolkit4mixedstudiesreviews.pbworks.com>

Mixed methods:

5.1. Is the mixed-methods research design relevant to address the qualitative and quantitative research questions (or objectives), or the qualitative and quantitative aspects of the mixed-methods question (or objective)?

5.2. Is the integration of qualitative and quantitative data (or results*) relevant to address the research question (objective)?

5.3. Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative data (or results*) in a triangulation design?

**The mixed-methods studies must also apply quality criteria from 1.1-1.4, and 4.1-4.4.*

***These questions are quoted from the MMAT criteria and tutorial document (Pluye et al. 2011:2).*

Our quality assessment will be conducted at the same time as data extraction. Prior to commencing quality assessment, we will conduct a kappa test for all three reviewers on our data extraction team (MBH, SID, JB) based on the quality assessment of a random 10% sample of our study set. If the resulting kappa statistic is less than 0.70, then we will revisit the coding protocol and quality assessment criteria to address and resolve any disagreement.

3.6 Data extraction and analysis

Once searches are complete across all three databases, along with snowballing (also referred to as backward and forward citation chasing), we will use a questionnaire form and spreadsheet for further data extraction.

The following data will be extracted from each study:

Table 3. Data extraction framework

Characteristics / variables for extraction	Type of response for extraction
Main geographic region and country in which study occurs	Continent, major geographic region (according to United Nations categories), and country (directed choice with comment box for country(-ies))
Study location	Mapped within AmigoCloud software by reviewer (either as a polygon or point, depending on detail within study). ID of mapped location logged during full extraction for study
Forest biome	Multiple choice: Tropical Temperate Boreal
Forest type	Multiple choice and open-ended for comment: Primary/native/old-growth forest Secondary/re-growth forest Planted/afforested
Names of nearby protected areas, if applicable	Open-ended
Basic information on study design and subjects	Directed choice and open-ended
Statistical method(s) used	Directed choice
Number of distinct populations/communities included in study (*team members will then extract subsequent variables for each distinct population/community)	Directed choice: Drop-down menu for 1, 2, 3 or more as choices
Name of indigenous group	Open-ended

continued on next page

Table 3. Continued

Characteristics / variables for extraction	Type of response for extraction
Do the authors indicate that the population within the study self-identifies as indigenous?	Yes/No/Not indicated
Scores of Yes/No/Unclear or not indicated for each additional metric of indigeneity for the population (×6)	
Do the authors indicate that the study population has a language and culture distinct from that which is dominant in the study country?	Yes/No/Unclear or not indicated
Do the authors indicate that the study population has a set of beliefs or cosmology distinct from that which is dominant in the study country?	Yes/No/Unclear or not indicated
Do the authors indicate that the study population has a distinct and customary social, economic and political system other than that which is dominant in the study country?	Yes/No/Unclear or not indicated
Do the authors indicate that there is a strong link between livelihoods of the study population and territory, ecosystem goods and ecosystem services?	Yes/No/Unclear or not indicated
What type of tenure is indicated for this population?	Directed choice
How long that tenure arrangement has been in place	Open-ended
Geographic extent of that tenure arrangement	Range of sizes for community land area
Is the tenure arrangement for this community statutorily recognized?	Yes/No/Unclear or not indicated
If there was a change to tenure formalization, what was it, and when did it take place?	Directed choice and open-ended
Scores of Yes/No/Unclear or not indicated for each component of the bundle of rights customarily held as reported for each population	Yes/No/Unclear or not indicated for both de jure and de facto
What activities does the population engage in with the local forest resources?	Directed choice
What is the degree of forest dependence for this community?	Open-ended and directed choice
What forest outcomes or conditions were reported as part of this study?	Directed choice, connected with forest loss, degradation, gain, conservation, re-growth
Direction of forest change and/or quality of forest conditions?	Directed choice
Which activities are for subsistence consumption/use within the community vs. for at-market sales?	Directed choice, combined with previous response
Are human well-being outcomes or conditions reported as part of this study?	Yes/No/Unclear or not indicated
What is the change or condition associated with those human well-being measures?	Directed choice

To identify and code characteristics of indigeneity across studies and sites, we will work from the basis of characteristics for indigenous populations outlined in Table 1 and Figure 1. Our team is cognizant of the inherent risk in this approach when reviewing study sites and introducing potential bias in assigning characteristics of indigeneity from studies within the existing literature base. Our objective is to avoid valuing one characteristic of indigeneity over others.

We will therefore adopt a two-step approach in characterizing indigeneity. Our primary consideration for assigning the categorization of ‘indigenous community forests’ to a specific study population and location will depend on the presence of *self-identification* as indigenous, or more accurately self-identification by the study population, as documented by the authors. We therefore treat self-identification as the primary factor for determining whether a community will be considered as indigenous for the purposes of this review. In cases where the author(s) identifies the study population as indigenous, but it is not clear whether the population *self-identifies*, we will note this in the extraction process. If there is not a clear indication of *self-identification* as indigenous or traditional peoples, we will continue to review for the presence of other characteristics across the other six in the list below. A community will be considered as non-indigenous if none of these characteristics is clearly indicated within the study. Regardless, we will code for any characteristics of indigeneity that are present. This will allow us to indicate whether a specific community exhibits one or more characteristics of indigeneity, but where the authors have not indicated that *self-identification* exists.

To assess tenure at each case or study site, we will indicate whether community landholdings are statutorily recognized, and where possible, note the composition of the bundle of rights associated with that recognition (e.g. those categorized by the Rights & Resources Initiative (RRI) as: access, duration, exclusion, management, alienation, withdrawal and due process and compensation) (RRI 2012). We will similarly note those lands that do not have statutory recognition, and still track, where possible, which rights within the bundle are still locally upheld in community forests (even those lacking formal recognition). For cross-referencing of our tenure classification at study sites, we will compare against the assessments of community land rights developed at the national scale by RRI and the LandMark mapping collaboration (www.landmarkmap.org), specifically the numbers they track on the percentage of land where the tenure rights are acknowledged by the government.

3.6.1 Data synthesis and presentation

Studies reporting qualitative methods and results will be analyzed separately from studies reporting quantitative methods and results. Studies which include both qualitative and quantitative results will have that duplication noted and each result will be analyzed separately as either qualitative or quantitative. Quantitative result synthesis will be used as our primary mode of analysis while qualitative results will be analyzed to provide context through a qualitative metasummary methodology (Sandelowski et al. 2007).

Qualitative

To analyze studies that report qualitative results, we will use the qualitative metasummary methodology pioneered by Sandelowski and Barroso (Sandelowski et al. 2007; Voils et al. 2008; Lawry et al. 2016). This methodology has been termed an ‘aggregative’ approach in that it focuses broadly on quantitatively identifying the frequency of findings among research results, with increased frequency indicating greater validity. This approach is not used to synthesize concepts or create lines of argumentation (Voils et al. 2008).

Metasummaries involve a five-stage process when evaluating findings: extraction of findings from the research; grouping them into categories; abstracting diverse findings into ‘themes’ with a comparable and coherent format; establishing the frequency and intensity of findings; and presenting and interpreting results. During extraction, care will be taken to ensure that these findings will be separated by: data presented as evidence in the research; conclusions of other work used to support findings; methods used to arrive at findings; and elaborations on the relevance of findings. Creating a matrix of findings grouped by topic and similarity to one another will enable us to better compare results among disparate studies and elucidate possible trends or relationships. Carefully abstracting findings through coding will improve comparability by removing unnecessary context and detail while preserving their complexity. It will also help to reveal overarching trends and other important insights,

while calculating frequency and intensity of findings helped to respectively understand the relative magnitude of findings and which studies contributed most or least to our overall sample of findings (Sandelowski et al. 2007; Voils et al. 2008; Lawry et al. 2016).

Quantitative

When assessing forest conditions and dynamics, we will separate out the sub-group of studies that use quasi-experimental or Before/After, Control/Intervention (BACI) design for meta-analysis of forest outcomes. For those studies with a BACI design, we will seek to standardize effect sizes to percentage change over estimated average counterfactual outcome (Samii et al. 2014). When possible, we will standardize effect sizes for forest outcomes to annual forest cover change rates (Puyravaud 2003).

For all included studies, we will map the locations of the community forested lands analyzed in the study set and use the Hansen et al. (2013) Global Forest Watch data to generate forest change metrics for the geographic regions included in our study set. While Global Forest Watch data will not be used to assess causal relationships for the areas under study, this data will help provide context for our analyses. We'll also use published classifications of national and sub-national trends in forest transition, particularly relevant in the tropical forest biome, so that we may compare our review findings across stages of the forest transition.

4 Conclusion

Our proposed review is aimed at informing policy makers, conservation and development organizations, and multilateral institutions interested in strengthening community land rights and implementing more effective conservation and sustainable development strategies.

We are actively engaged with these target groups, including: the US Agency for International Development (USAID), the World Bank, International Food Policy Research Institute, The Nature Conservancy (TNC), Landesa, the Land Alliance, the World Resources Institute, and RRI. Our systematic review will benefit from immediate access to and feedback from a TNC-led working group on tenure security and conservation, which includes many representatives from these institutions, as well as academia.

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Annexes

Annex 1. Search terms

Sample

Communal; customary; collective; cooperative; reserve

Phenomenon of interest

Traditional; tribal; indigenous; native; pastoral; nomad; autochthonous; aboriginal; forest-dependent; forest dwelling; traditional ecological knowledge; cosmology

Design

questionnaire; survey; interview; focus group; ethnography; case study; observation; participatory; map

Evaluation

forest; tree; deforest; reforest; forest conservation; forest degradation; forest harvest

Research type

qualitative; mixed method; quantitative; participatory

Annex 2. Search strings

Web of Science

Truncation: * allows for alternative beginnings and endings

(TS=(((deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR “forest harvest”) AND (trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (communa* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”)) NOT ((urban OR bat OR bird)))) AND LANGUAGE: (English) AND DOCUMENT TYPES: (Article OR Abstract of Published Item OR Book Chapter OR Proceedings Paper)

Indexes=SCI-EXPANDED, SSCI, A&HCI, ESCI Timespan=1990-2017)

Scopus

Truncation: * allows for alternative beginnings and endings

(TITLE-ABS-KEY(((commun* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (traditional OR trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*)) AND (((questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map*) OR (“quasi-experimental” OR qualitative OR “mixed method” OR quantitative)) AND (forest* OR tree* OR deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR NTFP OR “non-timber forest products” OR “forest harvest”))) NOT urban) AND

DOCTYPE(ar OR ip) AND PUBYEAR > 1995 AND LANGUAGE(english)

ProQuest (EBSCO)

Truncation: * allows for alternative beginnings and endings

(deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR “forest harvest”) AND (trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (communa* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”) NOT (urban OR bat OR bird)

removed NTFP and “non-timber forest products”

Date: After 1990; Source type: Reports, Scholarly Journals; Language: English

Annex 3. Search string evolution (example for Proquest)

(forest* OR tree* OR deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR niff OR “non-timber forest products” OR “forest harvest”) AND (traditional OR trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (commun* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR qualitative OR “mixed method” OR quantitative) NOT urban

93,000+ (5,472 with just full text excluded for the search)

(forest* OR tree* OR deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR NTFP OR “non-timber forest products” OR “forest harvest”) AND (traditional OR trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (commun* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”) NOT urban

65,000

removed tree

(forest* OR deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR NTFP OR “non-timber forest products” OR “forest harvest”) AND (traditional OR trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (commun* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”) NOT (urban OR bat OR bird)

added NOT bat OR bird

48,497

(forest* OR deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR NTFP OR “non-timber forest products” OR “forest harvest”) AND (trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (commun* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR

“case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”
NOT (urban OR bat OR bird)

removed traditional

36,460

(deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR NTFP OR “non-timber forest products” OR “forest harvest”) AND (trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (commun* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”) NOT (urban OR bat OR bird)

removed forest

6,088

(deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR NTFP OR “non-timber forest products” OR “forest harvest”) AND (trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (communa* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”) NOT (urban OR bat OR bird)

changed commun* to communa*

4,277

(deforest* OR reforest* OR “forest conservation” OR “forest degradation” OR “forest harvest”) AND (trib* OR indigen* OR native OR pastoral OR nomad* OR autochton* OR aborigin* OR “forest-dependent” OR “forest dependent” OR “forest dweller” OR “forest dwelling” OR “forest-dwelling” OR “traditional ecological knowledge” OR cosmolog*) AND (communa* OR customary OR collective* OR cooperative* OR reserv* OR territor*) AND (questionnaire* OR survey* OR interview* OR “focus group” OR ethnograph* OR “case study” OR observ* OR participat* OR map* OR “quasi-experimental” OR “mixed method”) NOT (urban OR bat OR bird)

removed NTFP and “non-timber forest products”

4,102 and improved relevance

restrict to all sources except full text. date. language. source type. down to 198

Annex 4. Databases

Scientific literature

Web of Science by Thomson-Reuters

<https://webofknowledge.com>

Scopus by Elsevier

www.scopus.com

ProQuest by ProQuest LLC

<http://www.proquest.com>

Google Scholar by Google

www.scholar.google.com

DOI: 10.17528/cifor/006674

CIFOR Working Papers contain preliminary or advance research results on tropical forest issues that need to be published in a timely manner to inform and promote discussion. This content has been internally reviewed but has not undergone external peer review.

Background. More than half of the earth's lands are collectively held by communities or indigenous populations, yet only a minor portion are formally recognized in their country's legislation. In many settings the absence of statutory recognition of land rights contributes to actual or potential tenure insecurity with subsequent indirect impacts for forested regions across the global tropics. Some researchers, policy makers and indigenous rights advocates argue that there are social and cultural characteristics associated with 'indigeneity' that contribute to healthier, more sustainable ecological conditions in areas under indigenous community control. It is further suggested that commensurate socio-ecological mechanisms are absent in areas held by non-indigenous communities. Yet, we risk oversimplifying a complex relationship if we assume a strong linear, positive relationship between a set of characteristics that imply "greater" indigeneity and a set of measures approximating healthier socio-ecological conditions. Conceptualizing indigeneity as existing within a continuous sphere, rather than as a dichotomous characteristic, this protocol describes a process for unpacking indigenous and community lands using a lens of indigeneity and tenure characteristics to examine their relative influence on socio-ecological conditions.

Methods. The primary research questions of the systematic review ask: "How does indigeneity (ranging from non-indigenous to indigenous) among communities living in or around forests correlate with socio-ecological conditions on those forested lands? and, How do tenure conditions further mediate or interact with characteristics of indigeneity to influence socio-ecological outcomes/conditions? We apply a Sample–Phenomenon of interest–Design–Evaluation–Research (SPIDER) framework to structure each stage of the systematic review, which comprises a comprehensive literature search, screening, quality assessment, data extraction and analysis.

We define the sample of interest as a geographically explicit area of community-held or managed forested land, phenomenon of interest as communities of forest-dwelling or forest-dependent peoples across the sphere of indigeneity, design as fieldwork approaches ranging from questionnaires and surveys to focus groups or ethnographies, evaluation as forest conditions and dynamics as well as measures of human well-being and land tenure, and research types as both qualitative and quantitative fieldwork and analysis approaches. We will search across three major bibliographic databases for relevant studies in the published literature, identifying quantitative, qualitative and mixed-method research as eligible for review. These search results will be screened by their titles and abstracts, followed by their full texts based on a defined set of eligibility criteria. To ensure that selected studies have controlled for potential biases, quality assessment will then take place alongside data extraction. Every effort will be made to designate a geospatial location (or set of locations) for each study included in the final study set, and to utilize additional spatial layers to build more context for our final narrative synthesis and evidence map. Finally, the results of quantitative and qualitative analyses will be reported in a narrative synthesis.



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