

## **How does governance mediate links between ecosystem services and human wellbeing? Results from a systematic mapping and rigorous review of literature**

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## **How does governance mediate links between ecosystem services and human wellbeing? Results from a systematic mapping and rigorous review of literature**

### **Abstract**

Many efforts to improve the sustainable management of renewable natural resources in low- and middle-income countries seek to achieve ‘win-win’ outcomes – improved ecosystem health and improved livelihoods. It is well established that achieving win-win outcomes is challenging; a host of variables affect the quality and performance of governance. This paper reports on research that sought to go beyond identifying factors that matter for effective governance to identify how governance mediates relationships between ecosystem services and human wellbeing. It did this through a systematic mapping of relevant literature and a subsequent rigorous review. Systematic mapping is a method used to describe and catalogue the available literature and evidence using systematic and transparent review processes. The analysis of the mapping focused on identifying which components of governance are studied, how much attention each geographical region and natural resource has received, finding that the literature is ‘clumped’ with some governance components, geographical areas and sectors well-studied while others have been poorly studied. The rigorous review analysed 190 papers in more detail, identifying recurring and key themes. The analysis found that there is very little literature that looks at governance, ecosystem health/services and poverty alleviation together in detail, with little evidence of interdisciplinary investigation. Much of the research instead focuses on either governance itself or governance and livelihoods or governance and ecosystem health/services. The analysis confirmed that there is little evidence of increased income resulting from community-based approaches to natural resource governance but there is evidence of empowerment that could lead to wider benefits and that ecosystem health has improved in some cases. The analysis identified a range of factors that contribute to this situation, including insufficient long-term support, lack of alternatives and power dynamics. Customary institutions remain critical for people to benefit from ecosystem services, though these are often constrained by government decisions.

### **Introduction**

For decades, a range of governance arrangements have either been in place already or designed and introduced in low- and middle-income countries to manage natural resources, including forests, fisheries and grazing land. These arrangements include state management by the relevant ministry or department, decentralised approaches involving local or devolved government, customary or traditional systems, community-based approaches, collaborative management, involving at least government and resource users and sometimes others such as non-governmental organisations, and market-based, or market-like, approaches, such as Payment for Ecosystem Services and certification schemes (Nunan, forthcoming). There may be several such systems in place at once and over time, leading to complex governance landscapes (Nunan, 2018). Introduced governance arrangements often seek to deliver on improved livelihoods, or reduced poverty, in addition to sustainable management of natural resources, often referred to as achieving ‘win-win’ outcomes (McShane et al., 2011). The potential to deliver on win-win outcomes has, however, been found to be challenging, with often mixed evidence of success. Instead, trade-offs between different conservation outcomes and between conservation and livelihood outcomes have to be negotiated and ‘hard choices’ (McShane et al., 2011: 968), resulting in losses to some, have to be made.

Multiple reviews have been undertaken to identify factors that enable or constrain the potential for governance arrangements to contribute to improved sustainability of the resource or improved livelihoods or both. These include reviews that are specific to a type of natural resource, with the majority related to forests, particularly on community forest management (Baynes et al., 2015; Bowler et al., 2012), but also on protected areas and forests (see Macura et al., 2015), though there are fewer on fisheries and even less on other natural resources, and reviews specific to regions (e.g. Galvin et al.

(2018) on community-based conservation in Africa). These reviews have drawn on data such as satellite data and census data on community-based structures (e.g. Oldekop et al., 2019) as well as involved systematic reviews (e.g. d’Armengol et al., 2018; Galvin et al., 2018; Mizrahi et al., 2019), systematic mapping of literature (e.g. Macura et al., 2015), realist synthesis (e.g. McLain et al., 2018) meta-analysis (e.g. Whitehouse and Fowler, 2018) and Qualitative Comparative Analysis (see Arts and de Koning (2017) and Baynes et al. (2015) on community forest management). These reviews have different objectives and scopes and do not all examine different types of governance arrangements and both ecological and livelihood outcomes.

What these reviews, syntheses and analyses have consistently found, however, is that there are mixed results of the governance arrangements in terms of social and ecological outcomes (Arts and de Koning, 2017; Baynes et al., 2015; Galvin et al., 2018) and there are many factors that are necessary for success but the specifics of these will vary over time and between locations (Agrawal et al., 2018; Baynes et al., 2015; Mizrahi et al., 2019). Several of these factors are identified by multiple reviews, such as the need for supportive policies and legislation (Agrawal et al., 2018; d’Armengol et al., 2018) and the need for positive government support (Baynes et al., 2015; Whitehouse and Fowler, 2018). There is also a consistent lament of the lack of data available and the need for more evaluation of governance approaches and outcomes (Bowler et al., 2012; d’Armengol et al., 2018; Evans et al., 2011).

Much of the focus of existing reviews on natural resource governance and outcomes is on what outcomes can be attributed to specific governance arrangements. There is some attention to process indicators, that is, factors that contribute to the performance and legitimacy of arrangements, such as participation and accountability. There has, however, been little attention given to *how* governance mediates positive links between natural resources and livelihoods. This is the focus of this paper. It asks this very question using the language of ecosystem services and poverty alleviation as the review stems from a project undertaken to review nine years of research funded by the UK Ecosystem Services and Poverty Alleviation (ESPA) programme<sup>1</sup>. The aim of the project was to collate findings from across ESPA-funded research on how governance is related to ecosystem health, and provision of ecosystem services, and poverty alleviation, and to situate those findings within wider literature. This article reports on the systematic mapping and rigorous evidence assessment of literature that was undertaken to situate the findings from ESPA-funded projects within. Systematic mapping of literature was chosen as it is a method that generates a broad picture of the literature in terms of where it is, what it is concerned with and what the gaps are and is particularly useful when there is insufficient (James et al., 2016). This was followed by rigorous evidence-focused literature review (Hagen-Zanker and Mallett, 2013) that sought to examine governance in relation to ecosystem services and poverty alleviation and involved the use of thematic analysis to identify recurring and prominent themes.

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<sup>1</sup> The Ecosystem Services and Poverty Alleviation programme (ESPA) was funded by the UK Natural Environment Research Council, UK Economic and Social Research Council and the Government’s Department for International Development between 2009 and 2018.

The methods used in the research are set out in the following section, after which the main findings from the systematic mapping are described and evaluated before going onto the main findings of the rigorous review. The article contributes to knowledge by providing a rare example of reviewing governance across natural resources, whereas many focus on one type of resource, and by focusing on what it is about governance that can enable ecosystem services to contribute to poverty alleviation. The key finding from the mapping and review is that there is little research that has addressed how governance mediates relationships between ecosystem services and poverty alleviation from which to draw conclusions on what works and why. There is, however, considerable related evidence from which to learn and inform future research that more specifically examines this question. From this evidence three key features of governance were found to increase the potential for ecosystem services to contribute to poverty alleviation. These features are a strong sense of local ownership and inclusivity; there being multiple governance systems and institutions in place which enable people to utilise different components and alter rules and systems to enable access to and benefits from ecosystem services; and, governance systems are needed that explicitly aim to deliver on poverty alleviation through ecosystem services, meaning that such aims should be on a par with conservation and sustainability.

## **Methods**

Two methods were used in this research. The first method was a systematic mapping of the literature and the second was a rigorous, evidence-focused literature review. Systematic mapping has been developed as a way of bringing together evidence on a topic, enabling identification of themes and gaps; it 'collates, describes and catalogues available evidence (e.g. primary, secondary, quantitative or qualitative) relating to a topic of interest' (James et al., 2016: 3). The aim of the systematic map was to identify the main themes of research related to the topic of governance, ecosystem health and human wellbeing. This was followed by a rigorous, evidence-focused literature review.

These methods were used rather than a systematic review for two main reasons. The first concerns the time and resources available to undertake the review, which were limited by the research programme that funded the research, and the second concerns the nature of much of the evidence. It was decided to undertake a systematic mapping of literature first so that the potential for certain types of evidence review could be assessed. It became apparent from the systematic mapping that there was very little strong evidence that tackled the entire question of interest. The question required evidence generated by multiple disciplines and perspectives. It was found, in particular, that there are relatively few journal articles that report on the details of ecosystem services in relation to governance and human wellbeing. This may be due to the word limit of journal articles as covering all three aspects in detail may require greater length than that permitted by many journals. It may also be due to the time and resources needed to undertake such multifaceted, multi-disciplinary research and the challenges of attributing aspects of ecosystem services to poverty alleviation and to the nature and performance of governance systems. It was concluded, then, that a rigorous, evidence-focused review of literature, following Hagen-Zanker and Mallett (2013), was appropriate and justifiable. Such a review enabled a rigorous approach to be taken to identifying and selecting publications, but also enabled a flexible approach to incorporating evidence. This was needed in the light of insufficient evidence addressing the question in full, but there being much excellent evidence that went some way towards addressing the question.

The systematic mapping began by developing a protocol to answer the question set out in the introduction. The protocol was presented at a consultation workshop in May 2017, at which academics, policy-makers and practitioners working in natural resource governance in an international development context were present. Feedback was sought on the protocol and changes were made to the search approach and search terms. Prior to the consultation workshop, an initial search via the Web of Science had generated 23,462 results. Searches in Web of Science and Scopus were initially

undertaken, however it was found that both search engines returned ‘false positives’ where articles appeared in the results even though the search terms were not present in the title, abstract nor keywords. For example, some appeared because the address of the institution included the term ‘forest’. Scopus returned more false-positives than Web of Science. Given the large number of articles in the preliminary sample and the limited resources available for the review, the final search was only conducted using the Web of Science. The search was also limited to terms in English. During the consultative workshop, the list of search terms was shared with the group of experts for their feedback on keywords that were missing. This led to an extensive revision of the search terms and a subsequent search which resulted in 53,674 articles. The search string used for the final search is included in Appendix 1.

There are several points to make regarding the search string used. To inform the discussion at the consultative workshop on the draft search terms, a review of literature on natural resource governance, ecosystem services and poverty alleviation was drafted and presented (Nunan, 2017). In this review, it noted that the term ‘governance’ is contested and is not always used in practice. Other terms may be used such as decision-making and institutions. It was therefore decided in developing the search string that articles that address governance but do not use the term governance (or govern or governing) would be included. The following definition of natural resource governance was used to inform the development of the part of the search string that focused on governance:

...natural resource governance can be understood as the norms, institutions, and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken and how citizens – including women, men, youth, indigenous peoples and local communities – secure access to, participate in, and are impacted by the management of natural resources.

Campese (2016: 7)

It was found that whilst it was difficult in conducting the coding to distinguish between governance and management, this definition proved to be a useful benchmark. Likewise for the terms ‘ecosystem services’ and ‘poverty alleviation’, there are multiple terms used that have similar meaning and intention. In relation to ‘ecosystem services’, within ‘sectoral’ literature, it is more likely that terms such as forests, non-timber forest products, fisheries and grazing land will be used. This reflects the slow progress within forest and fisheries management, for example, towards more ecosystem-based approaches, meaning that sectoral approaches dominate and subsequently sectoral terms also prevail over the wider ‘ecosystem services’ (Alexander and Haward, 2019; MacDicken et al., 2015). Therefore the search string reflects the diversity of terms used that refer to ecosystem services of relevance to governance and to contributing to poverty alleviation. Finally, in addition to poverty alleviation, search terms such as livelihoods and wellbeing were used to reflect different perspectives on the purpose of win-win endeavours, such as to improve livelihoods and wellbeing. The term wellbeing was given emphasis in the Millennium Ecosystem Assessment and livelihoods have been linked specifically to natural capital and sustainability in the sustainable livelihoods approach (Scoones, 2015).

The titles and abstracts of those articles were entered into EPPI Reviewer. Of those articles, include/exclude sorting was applied to a) all articles that included the term ‘governance’ which resulted in 2123 papers, b) a random sample of 10% of the 53,674 articles, taken using the ‘random allocation’ function of EPPI Reviewer, and c) all articles that were listed as results of the ESPA programme (341 papers) due to the increased likelihood that they would be relevant. Given some overlap in papers in each of these categories, the total number of papers sorted for include/exclude was 7386, resulting in 1427 papers included. The title and abstract of the 1427 paper abstracts and titles were then read and coded using codes from a literature review and the search strings, which had been consulted on during the consultation workshop. The broad categories of the coding were:

governance, poverty, natural resource sectors, frameworks, theory, geography and methods. The detailed coding is set out in Appendix 1. The results of this exercise are set out within the section on systematic mapping below.

From this sample of 1427 outputs, a rigorous evidence assessment was conducted. The title and abstract of the outputs were further screened on the basis of whether they showed potential for evidence in relation to demonstrating or explaining linkages between governance, ecosystem services and poverty alleviation. This screening resulted in a set of papers which were categorised as 'GoldStar', to which was added papers that were tagged in the original 7,386 as 'GoldStar' – i.e. they were coded as addressing something about all three dimensions. This resulted in a set of 435 papers.

The vast majority of these papers were then downloaded and read for a further sift of yes/no/maybe. A few were excluded as the full text could not be accessed. 'Yes' indicated that the papers did have something to say about how all three aspects are linked; 'maybe' that they were close and useful but did not strictly provide evidence in relation to how all three dimensions were linked; and 'no' was used where the outputs did not have anything to contribute. From that further sifting, 31 were categorised as 'yes', 167 as 'maybe' and 237 as 'no'. Initially, the 31 outputs were read in detail with the intention of undertaking detailed coding and thematic analysis. It was found however that few of these brought substantial insights to how governance mediates links between ecosystem services and poverty alleviation. In addition, it was concluded that the papers categorised as 'maybe' had significant insights of relevance to the research question even though the outputs did not address the question fully. Only 165 of the 167 could be accessed however, resulting in 196 outputs.

These 196 outputs were downloaded and read. For each output, the governance system or approach in place was recorded and coded and the main findings of each output were identified within the following areas: management approach or institutions; poverty/livelihoods; impact on ecosystem health; and, participation. Notes were made on the findings under each category and analysis undertaken by looking for recurring themes and findings that offered new perspectives and insights. These findings were not coded or analysed quantitatively. Rather, a thematic analysis was undertaken. This approach better reflects the qualitative nature of the majority of the data. Thematic analysis involves identifying prominent or recurring themes and summarising findings under thematic headings (Dixon-Woods et al., 2005). A data-driven approach to the thematic analysis was undertaken, informed by the systematic mapping. From the accumulation of thematic findings across the different governance arrangements conclusions were then drawn out and form the structure of the analysis under the rigorous review section.

## **Findings**

### *Systematic mapping*

The systematic mapping revealed some important trends in the literature. Governance itself was often not used in outputs. Instead, titles and abstracts spoke of specific aspects of governance (e.g. participation, institutions), forms of governance (e.g. community-based), or governance instruments (e.g. 34% of papers focused on Payments for Ecosystem Services (PES)). When the term governance was used, the abstract often did not provide details on which aspects of governance were studied (31% of papers) or how governance was understood.

The literature was found to be "clumped" with some governance components (Table 1), and sectors (Table 2) and geographical areas well-studied (Table 3), while others have been poorly studied. Forests dominate the literature (35%) while relatively few outputs were found in relation to wetlands (3%). Seventy-percent of papers were about instruments (e.g. PES, REDD+ and certification schemes) whereas relatively few focused on governance principles (8%) or rules (8%). The most well studied

region was sub-Saharan Africa (24%) with very little written about Australia/Oceania (1%) or the Middle East (1%). Many mention ecosystem services without specifying which aspect and talk generally about “poverty” and “livelihoods” without defining in the abstract how those are studied.

**Table 1 Percentage of papers addressing particular governance components**

<b>Governance</b>	<b>Percent papers</b>
Instruments	70%
Institutions	49%
Power	37%
Actors	43%
Forms	41%
PES	34%
Scale	31%
Community-based	25%
"Governance" (sub-theme not specified)	31%
Legislation	19%
Tenure	23%
Justice/equity	22%
Participation	25%
Protected Areas	19%
Social differentiation	18%
REDD	17%
Adaptive Capacity	14%
Principles	8%
Rules	10%
Decentralisation	8%
Conflict	6%

**Table 2 Percentage of papers addressing particular sectors**

<b>Sector</b>	<b>Percent papers</b>
Forests	35%
Fisheries	12%
Agriculture	10%
Water	12%
Other	8%
Coastal/Estuary/Marine	7%
Pastoralism	5%
River/River Basin/Watershed/Delta	4%
Land	4%
Wetlands	3%
Urban	1%
Landscape	1%
Mining/Extraction	1%
Mangrove	1%

**Table 3 Percentage of papers by geographical location**

<b>Location</b>	<b>Percent papers</b>
sub-Saharan Africa	24%
Global	16%
South America	12%
Southeast Asia	13%
South Asia	13%
North America	4%
East Asia	6%
Other	2%
Australia / Oceania	1%
North Africa	1%
Europe	2%
Middle East	1%

For sub-Saharan Africa, there are more papers that focus on institutions and instruments whereas for South America, there is more focus on power than that found in the other regions. In South Asia, institutions and community-based management were more dominant which reflects a high concentration of papers on community forestry in Nepal. For East Asia and Southeast Asia, the concentration centred more around instruments and PES in particular.

Within the papers on the forestry sector, there was greatest prevalence on instruments (PES, REDD+ and certification). Interestingly, almost half of the papers that referred to tenure were about forests. The literature on fisheries focused more on instruments and questions of scale and actors. The studies on water focused more on institutions and instruments.

The term ‘livelihoods’ was the most commonly used poverty-related term with a grouping of articles that spoke to livelihoods and institutions. For papers that addressed instruments, they also included measure of income/assets and benefits/payments. Community-based management papers tended to refer to livelihoods without providing specific details in the abstract.

Many of the papers were clearly relevant to two of the dimensions under consideration. So, for example, they spoke to the impacts of community-based forest management (governance component) on local livelihoods (poverty measure) but did not necessarily address the impacts of the management on ecosystem services. Others looked at biodiversity (ecosystem services) in national parks (governance component). Very few clearly described research on all three components in the same study. Those that did were labelled ‘gold star’ and were included in the rigorous evidence-focused review outlined below.

*Rigorous review*

This section presents the findings from the coding and thematic analysis of the 196 outputs. Table 4 sets out the percentage of outputs categorised under each type of governance regime. The category ‘community-based management’ includes collaborative forms of governance, generally where resource users collaborate with government in managing a resource, such as in fisheries co-management and joint forest management, as well as arrangements where communities manage resources more independently. There may in practice be overlaps between these governance regimes



and cases where multiple resource regimes exist. The categorisation serves the purpose of identifying the main governance focus of the outputs reviewed.

**Table 4 Governance system in ‘Goldstar’ papers**

Governance system	Percentage of outputs
Community-based management (including co-management)	32
PES/REDD/market-based conservation	19
Forest governance general	12
Protected areas (terrestrial and marine)	12
Commons	4
Customary	4
Other	17

As seen in the Table 4, the majority of outputs focused on community-based management approaches whereas there were relatively few that focused on commons or customary arrangements. This is not to say that these arrangements are not widely found but that they may not have been researched to the same extent as community-based management approaches in terms of delivering on both ecological and livelihood outcomes.

Table 5 provides the percentages of outputs focusing on different types of natural resources. The percentages reflect the dominance of papers on forests in the systematic mapping (35% of outputs) and similar percentages for fisheries (9% compared to 12% of outputs in the systematic mapping) and pastoralism (4% compared to 5%).

**Table 5 Type of natural resource in ‘Goldstar’ papers**

Type of natural resource	Percentage of outputs
Forests	46
Fisheries	9
Pastureland/rangeland	4
Wildlife	4
Coastal/marine	9
Irrigation	2
Watershed	6
Multiple	5
Other	15

Table 6 identifies key findings within the papers reviewed within each category of governance regime against the following themes: governance performance, participation, poverty reduction/livelihoods, institutions and ecosystem health. The key findings by type of governance arrangement provide an insight into what tends to be found or be of concern for the different types of governance arrangement but there must be considerable caution in comparing and contrasting findings between governance systems. This is because in practice there are likely to be multiple regimes, or elements of regimes, in place at any one time and considerable variations in what governance systems look like and how they conduct governance in practice within each category. This makes drawing firm conclusions about a type of governance arrangement problematic and potentially misleading.

Instead, then, recurring and prominent themes were identified from across the regime types that bring insights to answering the question ‘how does governance mediate the relationships between

ecosystem services and poverty alleviation?'. These are clustered within the following three observations:

1. Governance that is locally owned and inclusive increases potential for ecosystem services to deliver on improved livelihoods.
2. There are generally multiple governance structures and systems in place in any institutional setting and these interact and adapt over time in response to preferences and power dynamics.
3. Governance systems rarely offer appropriate and adequate incentives to deliver on poverty alleviation through ecosystem services.

*Governance that is locally owned and inclusive increases potential for ecosystem services to deliver on improved livelihoods*

There is consistency across the governance types that local ownership and inclusivity of the arrangements increases the potential for ecosystem services to deliver on improved livelihoods. Evidence for local ownership is particularly found within customary systems and within some examples of community-based management, where space and measures are in place leading to empowerment of resource communities resulting in a sense of ownership of the resource and genuine voice in decision-making. However, many factors constrain the potential to develop a sense of ownership, particularly beyond a few actors who may capture the benefits resulting from forms of governance. These factors include power dynamics and norms within communities that make participation by some actors difficult. This may be manifested in people not being willing to speak up in meetings, certain people not being elected onto committees or some people, often women, not having the time to participate in governance systems. Beyond communities, governments are often reluctant to share power over decision-making and rule enforcement in a meaningful way, presenting a further constraint on developing local ownership and inclusivity.

Local ownership is particularly found within customary institutions as these were formed, and are sustained, by resource users themselves. An example of customary institutions delivering on improved ecosystem health and livelihoods is given in Sheppard et al. (2010), which documents the socioeconomic and ecological results of ten years of community-governed environmental management in Wechiau, in northern Ghana, bordering Burkina Faso. The Wechiau Community Hippo Sanctuary was founded in 1998 by the Paramount Chief of the Wechiau Traditional Area, together with sub-chiefs and other leaders. The initiative for the formation of a community-managed sanctuary sprang from resistance to the intended formation of a government-run reserve. There was then external influence, but local ownership in terms of establishing a governance approach that was locally appropriate. The reserve aligned with existing taboos and myths associated with hippopotami and created a governance system that included representation from the multiple ethnic groups settled in the area. The sanctuary has brought in revenue through ecotourism employment and a shea nut cooperative, though also benefited from donor funding, and evaluation of the project reported on improved access to water, schools, lighting and health care (Sheppard et al., 2010). Whilst the initiative faces challenges in maintaining these positive outcomes, it provides an example of local ownership and of an initiative led by and building on existing customary institutions.

A further example of the positive outcomes associated with customary institutions is reported on by Patenaude and Lewis (2014). They compared the impacts of four prominent resource management systems on ecosystem services and on poverty alleviation to inform REDD+ planning in Tanzania. The four systems were: Community Based Forest Management (CBFM), Joint Forest Management (JFM), Wildlife Management Areas (WMAs) and *ngitili* enclosures, a traditional land husbandry technique practised by some Sukuma pastoralists. Their analysis draws on data collected through participant observation, workshops and a review of relevant literature. From the analysis, they concluded that *ngitili* and CBFM were most successful in terms of outcomes for ecosystem health and poverty

alleviation, which they attributed to decisions on management being made at the local level, bringing perceptions of equity and legitimacy amongst community members.

However, customary institutions have at times been marginalised and dismantled by government decision and action, including as a result of new institutions being introduced. Akamani et al. (2015) provide an example of this in Ghana, where the traditional authorities were not given formal recognition in forest management in the implementation of community forest management, contributing to a weakening of their role and erosion of social norms.

In contrast, a number of challenges related to participation of marginalised stakeholders and capture of new governance arrangements by elite members of communities reduce the wider sense of ownership by community members and results in more exclusion than inclusion. Factors such as gender, wealth and ethnicity affect the potential to participate effectively in many contexts. Several sources provided evidence of elite capture in community forest and other governance programmes in Nepal, where people of higher caste and greater wealth dominated committees (Adhikari and Di Falco, 2009; Agrawal and Gupta, 2005). This led to the exclusion of lower caste and poorer community members and rules that tended to benefit richer rather than poorer community members.

However, Adhikari and Di Falco (2009) also found that if people from lower caste households attended village meetings over time, the probability of them being elected onto the committee increases. This suggests that elite capture can be challenged over time through perseverance. It can also be challenged through external agencies supporting the emergence of community-based governance structures and systems over time (Persha and Andersson, 2014).

In addition to elites often capturing community-based governance structures, more marginalised people may be unable or reluctant to participate due to the high opportunity costs of participation (Adhikari, Kingi and Ganesh, 2016). There are few examples in the literature of how such barriers – elite capture and opportunity costs of participation – can be overcome to enable effective and equitable participation in community-based management. Banjade and Ojha (2005) do, however, provide an example of a pilot initiative that sought to address such a situation. They reported on the testing of a deliberative process with a Community Forest User Group (CFUG) in Nepal which hadn't been meeting due to the distance between communities, which meant that it was too far to travel for some members and for women outside the area, they needed permission to travel beyond their own community. The intervention involved the convening of more decentralised, local meetings, which focused on involving women and lower caste members, with the meeting facilitated by NGOs. The intervention resulted in greater participation of women and lower caste in CFUGs and a greater sense of ownership. The article provides a rare example of how challenges related to inclusion of women and marginalised community members, in this case due to caste, can be overcome.

Beyond intracommunity dynamics, governments do not assist in the development of a sense of ownership through community-based governance by holding onto substantial power, offering very little in the way of power-sharing. Baynes et al. (2016) found, for example, that little power had been devolved from central government to local government staff and then from that level to community forest groups and from community forest groups to local people. Without further devolution of power, they claim that 'community forestry is likely to fail' (Baynes et al., 2016: 175).

Although many challenges have been associated with community-based management delivering on a sense of local ownership and inclusivity, examples were found where empowerment has resulted from the implementation of community based resource management. Sultana and Thompson (2007), for example, reported on empowerment through more secure access to fisheries through co-management arrangements in Bangladesh.

What these factors and examples demonstrate is that a sense of local ownership and inclusivity are positive for enabling ecosystem services to contribute to poverty alleviation but such ownership and inclusivity cannot be assumed to result from the implementation of community-based approaches. Existing power dynamics, elite capture, constraints on participation resulting from opportunity costs and social norms and limited power sharing by government limit the potential for developing ownership and inclusivity.

*Multiple governance structures and systems interact and adapt*

There are generally multiple governance structures and systems in place in any institutional setting and these interact and adapt over time in response to preferences and power dynamics. This situation can be positive for enabling ecosystem services to deliver on poverty alleviation as people navigate through and utilise a range of institutions to access resources and secure rights. However, it can also be problematic; for example, measures to increase the participation of, and benefits to, women from community-based management may be countered by customary norms and practices.

The potential to identify links between forms and approaches of governance with ecosystem and livelihood outcomes is made challenging by the existence of multiple forms of, and dimensions to, governance at any one time and place. This multiplicity results from there being a wide range of bureaucratic and socially-embedded institutions, within and beyond those created for natural resource management, that impact on how people access and benefit from natural resources (Nunan et al., 2015), local government structures, customary systems and community-based and collaborative structures initiated by specific government ministries or departments, such as water, forests, fisheries or wildlife management. Many of these exist at multiple administrative levels, such as village, sub-district, district and national levels, and interact with, and are influenced by, institutions, structures and decisions existing and made at other levels and scales, including international. As Ingram et al. (2015: 59) observe 'multiple governance arrangements are a reality'. They illustrate this reality through their analysis of the governance of different forest product value chains, where combinations of arrangements, such as project-based, statutory and market-led arrangements build on customary knowledge and rules and have delivered on 'win-wins' of improved livelihoods and forest conservation (Ingram et al., 2015). Whilst these examples of combinations of arrangements illustrate the reality of governance, Ingram et al. (2015) also observe that the arrangements had restricted access, and therefore benefits, to certain groups of people, whether based on gender or ethnicity and so had not generated win-win outcomes for all.

Given this multiplicity of institutions, actors and governance systems, it is challenging to isolate the decisions and influence of one system or component and attribute outcomes to certain decisions and actions. The situation is further complicated by the interaction between institutions, resulting in changes to structures, practice and outcomes. One approach to describing and analysing how institutions interact and with what outcomes is institutional bricolage, referring to the way 'in which people patch together institutions from existing social and institutional arrangements' (Hall et al., 2013: 168). De Koning (2014) finds from the introduction of community forestry in the Amazon examples of new structures being rejected by existing institutions, of new and/or existing institutions being altered as a result of their interaction and of pieces of existing and introduced institutions forming new arrangements. The interaction between existing and newly introduced institutions means that although new institutions are often implemented in the same form at scale, for example a nationwide policy on community forest management or fisheries co-management, differences will emerge over time within and between structures, practices and outcomes.

Despite there being a multiplicity of structures, systems and practices, many derive from government, though not necessarily all from the same part of government, so there may be conflicting and

contrasting policy and regulations operating within one governance system. Although there are many examples of decentralised and participatory forms of governance, such as community-based natural resource management (CBNRM), rules and regulations regarding the governance system and how resources can be used still derive from government. There may be little scope for the users of a resource to develop or modify rules and regulations. In the case of community forestry in Tanzania, Strauch et al. (2016) found that rules and regulations derived largely from central government, resulting in a lack of awareness about the rules and regulations and a lack of cultural relevance, which affected willingness to comply. The top-down nature of community-based approaches limits the scope for these approaches to be locally-specific and responsive, which may contribute to the limited ability to contribute to improved livelihoods and ecosystem health.

*Governance systems rarely offer appropriate and adequate incentives to deliver on poverty alleviation through ecosystem services*

Literature across the governance forms consistently highlights the inadequacy of incentives to people expected to play a role in governing natural resources. Conservation is generally prioritised and instead of benefiting through poverty alleviation or improved livelihoods, poorer people often bear the cost of conservation (Bluwstein et al., 2016). Examples of communities bearing the cost of conservation include exclusion from protected areas, where access to land for agriculture and grazing has been lost (Garrity et al., 2002; Moyo et al., 2016). Where there is compensation associated with conservation, notably through PES schemes, the system for the distribution of benefits does not always result in sufficient compensation for individuals to be motivated to comply with rules and participate effectively (Krause and Loft, 2013).

Adhikari, Ojha and Bhattarai (2016) highlight how emphasis on conservation in Nepal rather than recognition and prioritisation of food security presents a lost opportunity to improve food security, particularly for the poor. They identify several factors that contribute to this situation: the centralized control of forest management despite the implementation of community forest management, the emphasis given to forest conservation, the lack of integration and coordination between forest and agriculture policies and lack of support given to scaling up and strengthening innovation in utilising food from forest ecosystems. These factors reflect the sector-led approach of forest management and challenges associated with limited coordination and cooperation across government departments and ministries.

A further example of disincentives for participation in resource governance despite the implementation of community forest management is found in cases where only low quality forest is made available for community forest management (Gritten et al., 2015). Anderson et al. (2015) refer to this phenomenon as ‘managing leftovers’. They draw on the experience of community forestry in Cameroon, Kenya and Nepal and conclude that local communities are often left with only access to resources such as limited value non-timber forest products, seedling production and bee keeping. Through the process of implementing community forest management, few additional rights and responsibilities may in practice be transferred, limiting benefits and incentives.

**Discussion and conclusion**

The key finding from the mapping and review is that there is insufficient research that addresses how governance mediates relationships between ecosystem services and poverty alleviation from which to draw conclusions on what works and why. There is, however, considerable related evidence from which to learn and inform future research that more specifically examines this question. From this evidence three key features of governance were found to increase the potential for ecosystem services to contribute to poverty alleviation. These features are a strong sense of local ownership and inclusivity; there being multiple governance systems and institutions in place which enable people to utilise different components and alter rules and systems to enable access to and benefits from

ecosystem services; and, governance systems are needed that explicitly aim to deliver on poverty alleviation through ecosystem services, meaning that such aims should be on a par with conservation and sustainability.

This conclusion suggests that where new approaches to governance are introduced they should endeavour to build on existing systems and rules, particularly where those were developed and maintained by the community. Those involved in designing and implementing governance approaches should recognise that governance structures, systems and practice will change over time as institutions interact and people respond to the new structures and rules. This suggests that a policy environment is needed that encourages and supports greater flexibility in forms and practice of governance.

In addition to understanding and building on existing systems and rules, deliberate effort is needed to enable appropriate participation of all stakeholders. There was little evidence in the literature of how challenges to participation in resource management could be overcome. The example given in Banjade and Ojha (2005) of using smaller, more local meetings, facilitated by an NGO, can be learnt from. For example, existing women's groups, such as savings and credit groups, could be used to bring women into community-based governance systems more consistently and effectively. NGO, or other external actors, can facilitate more decentralised governance whilst also supporting communities in countering the tendency towards elite capture, though this would require funding over a potentially considerable period of time.

Through building on existing institutions and enabling more effective and appropriate participation, local ownership of governance may increase with positive ecological and livelihood implications. However, the extent and nature of power sharing with government would need to be reconsidered. Too often governments cling onto power and decision-making in key areas, giving communities little scope for decision-making and influence over how natural resources are used and managed. Without further devolution of power, local ownership will not be adequately developed, though devolution of power would be insufficient on its own and inclusivity is also important and would be threatened by elite capture and gendered norms that limit participation of, and benefits to, women.

If governance is to effectively strengthen relationships between ecosystem services and poverty alleviation, then poverty alleviation or similar objectives would have to be on a par with conservation objectives rather than seen as something that will naturally result as a 'co-benefit' of community-based conservation initiatives.

What stands out as substantially missing from the body of relevant literature is consideration of how the wider political and economic environment affects what the governance system looks like, how it behaves and how the outcomes are constrained, for example in terms of there being viable and accessible alternative livelihoods. There are some dimensions identified, notably corruption, but not a lot in terms of examining governance, ecosystem services and poverty alleviation. Analyses of the political economy of governance is an area that could shed further light on how governance could mediate more positive relationships between ecosystem services and poverty alleviation.

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**Table 6 Key themes in each governance regime**

Theme	Community-based management	PES/REDD/Market-based conservation	Forest governance (not community-based)	Protected Areas	Commons	Customary	Other
Governance performance	<ul style="list-style-type: none"> <li>Mixed performance</li> <li>Challenging to sustain over time, e.g. training not provided once external funding stops</li> <li>Ownership not always developed</li> <li>Bureaucratic hurdles to adoption</li> <li>Consistent finding that little power is shared or devolved in practice; held onto by government</li> <li>Insufficient recognition of informal institutions</li> <li>More integration</li> </ul>	<ul style="list-style-type: none"> <li>Need to consider other governance arrangements in design</li> <li>Follow up support needed over time to maintain system, participation and awareness</li> <li>Local context matters as PES interacts with existing institutions</li> </ul>	<ul style="list-style-type: none"> <li>Decentralization enables elite capture, the degree and effect of which can be reduced through involvement of external agencies</li> <li>No single approach that can deliver on everything</li> <li>Yet, the existence of multiple governance systems brings complexity and is challenging for legitimacy and accountability</li> <li>Institutions can be reshaped, affecting forest governance outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Protected area governance interact with other systems – do not operate in isolation</li> <li>Often a lack of policy coordination</li> <li>Evidence in support of shared governance</li> </ul>	<ul style="list-style-type: none"> <li>Self-enforcement of rules needed</li> <li>Organizational capacity of communities is contributing factor in continuing conservation initiated with external support</li> </ul>	<ul style="list-style-type: none"> <li>Customary institutions are not always recognised or respected.</li> <li>However, they often remain in some form over time and influence new institutions and practice</li> <li>Power relations shape institutions and their evolution</li> </ul>	<ul style="list-style-type: none"> <li>Diversity in membership can bring benefits to problem solving</li> <li>Historical context matters</li> <li>Underlying inequalities matter</li> <li>Intersectoral integration often poor</li> <li>There may be multiple and complex institutions</li> </ul>

Theme	Community-based management	PES/REDD/Market-based conservation	Forest governance (not community-based)	Protected Areas	Commons	Customary	Other
	with local institutions needed <ul style="list-style-type: none"> <li>• Consistent evidence of elite capture</li> <li>• Power differentials not adequately recognised</li> </ul>						
Participation	<ul style="list-style-type: none"> <li>• Initiatives to encourage participation of women and poor not adequate</li> <li>• High costs of participation not recognised</li> <li>• Example from Nepal of participation of women and lower caste increased through more decentralised approach and</li> </ul>	<ul style="list-style-type: none"> <li>• Governments must play active role to facilitate participation of, and benefits to, the poor</li> </ul>	<ul style="list-style-type: none"> <li>• Participation affected by social differences</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient incentives to participate in conservation</li> </ul>			

Theme	Community-based management	PES/REDD/Market-based conservation	Forest governance (not community-based)	Protected Areas	Commons	Customary	Other
	external facilitation <ul style="list-style-type: none"> <li>• Non-elite may not have skills and status for election</li> </ul>						
Poverty reduction /livelihoods	<ul style="list-style-type: none"> <li>• Mixed evidence in terms of poverty reduction and improved livelihoods</li> <li>• Some evidence of ‘uneven’ benefits</li> <li>• Livelihoods and food security not prioritised compared to conservation</li> <li>• Community management tends to be given ‘leftovers’ (e.g. degraded forest)</li> </ul>	<ul style="list-style-type: none"> <li>• Level of payment often not enough to incentive or compensate – need other benefits</li> <li>• Can be tensions between achieving equity and additionality</li> <li>• Benefits reach local elites</li> </ul>	<ul style="list-style-type: none"> <li>• Mixed evidence regarding livelihood impacts</li> <li>• Poor tend to bear the costs of conservation</li> <li>• Enforcement of rules may prevent access and benefits with negative impacts on livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>• Mixed evidence on impacts on livelihoods</li> <li>• Restrictions can negatively affect livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>• Trade-offs likely between sustainability and livelihood aims</li> </ul>	<ul style="list-style-type: none"> <li>• Can deliver on equity</li> <li>• Customary institutions need to be reinvigorated to deliver on poverty alleviation</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of social differences can inform project design and implementation</li> <li>• Income and employment generation often insignificant</li> <li>• Benefits may be mediated by elites</li> </ul>

Theme	Community-based management	PES/REDD/Market-based conservation	Forest governance (not community-based)	Protected Areas	Commons	Customary	Other
	<ul style="list-style-type: none"> <li>• More evidence of empowerment rather than livelihood improvement</li> </ul>						
Ecosystem health	<ul style="list-style-type: none"> <li>• Link between inequalities and forest conditions</li> <li>• Original condition relevant</li> <li>• Compliance affects condition</li> </ul>	<ul style="list-style-type: none"> <li>• Mixed outcomes in terms of ecosystem health</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainable management is more likely to happen in locally managed forest that are large and provide diverse non-timber forest products</li> <li>• Diversity of livelihood benefits associated with species richness in forest commons.</li> </ul>	<ul style="list-style-type: none"> <li>• Mixed evidence on positive outcomes for ecosystem health</li> </ul>			

## Appendix I Search String and Coding for Systematic Mapping

### Search string

((govern\* OR decision-mak\* OR "decision mak\*" OR institution\* OR cooperative\* OR co-manage\* OR stakeholder\* OR participat\* OR justice OR equity OR transparen\* OR accountability OR power\* OR legitim\* OR rule\* OR "regulations" OR regulatory OR tenure OR "land rights" OR "user rights" OR "human rights" OR "local rights" OR community?led OR community?based OR communal OR "open pool" OR "common property" OR participatory OR community near/3 management OR intersectorial OR collaborative)

AND

(REDD OR REDD+ OR "natural resource\*" OR "ecosystem service\*" OR "environmental service\*" OR biodiversity OR "non-timber forest product\*" OR NTFP\* OR timber OR fuelwood OR wood OR carbon OR water OR fish\* OR grazing OR pastoralis\* OR fodder)

AND

(poverty OR poor OR livelihood\* OR wellbeing OR well-being OR income\* OR "food security" OR welfare)

NOT

monoxide NOT cancer NOT physician\* NOT oxygen NOT chemical NOT fluorescence NOT bacteria\*) OR "payment\* for ecosystem services" OR "payment\* for environmental services"

### Coding for Systematic Mapping

#### Governance

- a. Actors
  - i. Individual
  - ii. Household
  - iii. Community
  - iv. Government
  - v. NGO
  - vi. Private sector
  - vii. Civil society
- b. Institutions
  - i. Formal
  - ii. Informal
  - iii. Government
  - iv. community
  - v. religious
- c. Power
  - i. Access
  - ii. Land tenure
  - iii. Common-pool
  - iv. Open access? resources
  - v. decentralisation
  - vi. other
- d. Scale
  - i. Local
  - ii. Subnational
  - iii. National
  - iv. Regional

- v. International
    - vi. Multi-level
  - e. Forms
    - i. Community-based, including CBNRM
    - ii. Multi-level
    - iii. Decentralisation
    - iv. Collaborative/co-management
    - v. Market-based
    - vi. CSR
  - f. Social differentiation
    - i. Gender
    - ii. Marginal groups
    - iii. Indigenous
  - g. Principles-Accountability
  - h. Principles-Participation
  - i. Principles-Transparency
  - j. Principles – Legitimacy
  - k. Principles - Trust
  - l. Adaptive capacity
    - i. Information sharing
    - ii. Adaptability
    - iii. resilience
  - m. Justice/equity
  - n. Instruments
    - i. Tax
    - ii. Certification
    - iii. Government policy/regulation
    - iv. Legality verification
    - v. Changes to legal framework
    - vi. PES
    - vii. REDD
    - viii. Carbon markets (or are we necessarily including that in PES?)
    - ix. Other
- 2. Poverty
  - a. Livelihoods
  - b. Wellbeing
  - c. Multi-dimensional
  - d. Income & assets
  - e. Employment
  - f. Time
  - g. Health
  - h. Education & skills
  - i. Food security & nutrition
  - j. Fuel & energy
  - k. Vulnerability & resilience

- l. Property rights
  - m. Water
  - n. Social capital
  - o. housing
  - p. Capacity/Capabilities
3. Ecosystem Services (following ES Framework)
- a. Provisioning
    - i. food
    - ii. Water
    - iii. Wood/fibre
    - iv. fuel
  - b. Regulating
    - i. Climate
      - 1. carbon
    - ii. Disease
    - iii. Flood
    - iv. Water purification
  - c. Cultural
    - i. Aesthetic
    - ii. Spiritual
    - iii. Education
    - iv. recreation
  - d. Supporting
    - i. Nutrients
    - ii. Soil
  - e. Dis-services
4. Sector
- a. Forest
  - b. Fisheries
    - i. Marine
    - ii. freshwater
  - c. Agriculture
  - d. Mining/extraction
  - e. Urban
  - f. Other
5. Frameworks
- a. SES
  - b. ES Framework
  - c. Political ecology
  - d. Resilience
  - e. Sustainable livelihoods
  - f. Environmental Entitlements and Property rights



- g. Vulnerability
- h. IPBES
- 6. Theory
  - a. Common property theory
  - b. Governmentality
  - c.
- 7. Geography
  - a. South America
  - b. North America
  - c. SS Africa
  - d. N Africa
  - e. Europe
  - f. Middle East
  - g. South Asia
  - h. Southeast Asia
  - i. Other
- 8. Methods
  - a. Qualitative
  - b. Quantitative
  - c. Mixed