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Position Paper

Importance of Tenure and Governance for Multifunctional Landscapes

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About Multifunctional Landscapes: Multifunctional Landscapes is a CGIAR Science Program that aims to enhance the resilience, productivity, and sustainability of agricultural landscapes by integrating diverse land uses, ecosystem services, and livelihood strategies. The initiative supports evidence-based policies and innovations that balance food production with climate adaptation, biodiversity conservation, and social inclusion. By collaborating with local communities, governments, and partners, it promotes landscape level approaches to managing natural resources for long-term ecological and economic benefits. Learn more here: https://www.cgiar.org/initiative/multifunctional-landscapes

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Contents

Introduction 3

Framework for landscape-level institutional arrangements 3

Tenure arrangements 5

Coordination mechanisms 6

Conclusions 8

References 9

Importance of Tenure and Governance for Multifunctional Landscapes

Introduction

Agricultural production occurs within landscapes that combine crop fields along with other types of land uses such as animal grazing areas, forests, agroforestry areas, wetlands, and water bodies, each influencing and being influenced by the others (Altieri et al., 2018). While these are often considered separately, there are complex flows of resources—including nutrients, water, energy, and labor—among these different components. What is done on one area will affect others. For example, use of pesticides to increase production of certain crops can kill pollinators that are needed for other crops, or pollute waters that affect fish downstream. Positive externalities are also possible: afforestation can reduce soil erosion and affect the timing and volumes of water flows.

Landscapes are not static; they are shaped by ongoing interactions between natural processes and human activities at various levels, from the local to the national and even international levels. There is growing attention to considering how interconnected components of the landscape can be managed to yield multiple benefits and balance economic, social, and environmental goals (Estrada-Carmona et al., 2024).

Maintaining such complex, multifunctional landscapes requires coordination across multiple uses and actors to increase ecosystem services and reduce negative environmental impacts (R. S. Meinzen-Dick et al., 2022). But multifunctionality is a choice, not a default, for decision-makers. There are often forces that push toward simplification of landscapes or conversion of high- value (economic and non-economic) natural capital stocks like forests into land uses that maximize the delivery of certain provisioning ecosystem services (ES), often at the expense of other ES. Who decides the “utility function” of the landscape and how the decisions are made is a political economy question.

Under the CGIAR Science Program on Multifunctional Landscapes, a key research question is what institutional frameworks and governance models best support sustainable landscape management and promote multifunctionality (CGIAR, 2024).

This paper provides an entry point for identifying institutional arrangements to facilitate multifunctional landscape approaches. The next section provides a framework for identifying existing tenure and governance arrangements and gaps to be filled. We then go into more detail on the range of private, public, and common property and the webs of interests that link landscape stakeholders. The following section discusses governance arrangements for coordination across landscapes, including collective action, multistakeholder platforms, and polycentric governance. Each section provides an overview of key concepts and how they apply to landscapes, and refers to other resources to go deeper on each concept. The final section offers guidance on how to use this to strengthen institutions for multifunctional landscapes.

Framework for landscape-level institutional arrangements

Figure 1 illustrates how the scale and time frame of landscape elements relate to key institutional arrangements. Particular practices can be placed in terms of their time frame, from short term, within a season, to long term, over decades, and spatial scale, from a plot to a community, and landscape, levels. Annual crop production is a plot-level practice, which can yield returns within a season. Its application is therefore primarily up to individual farmers.

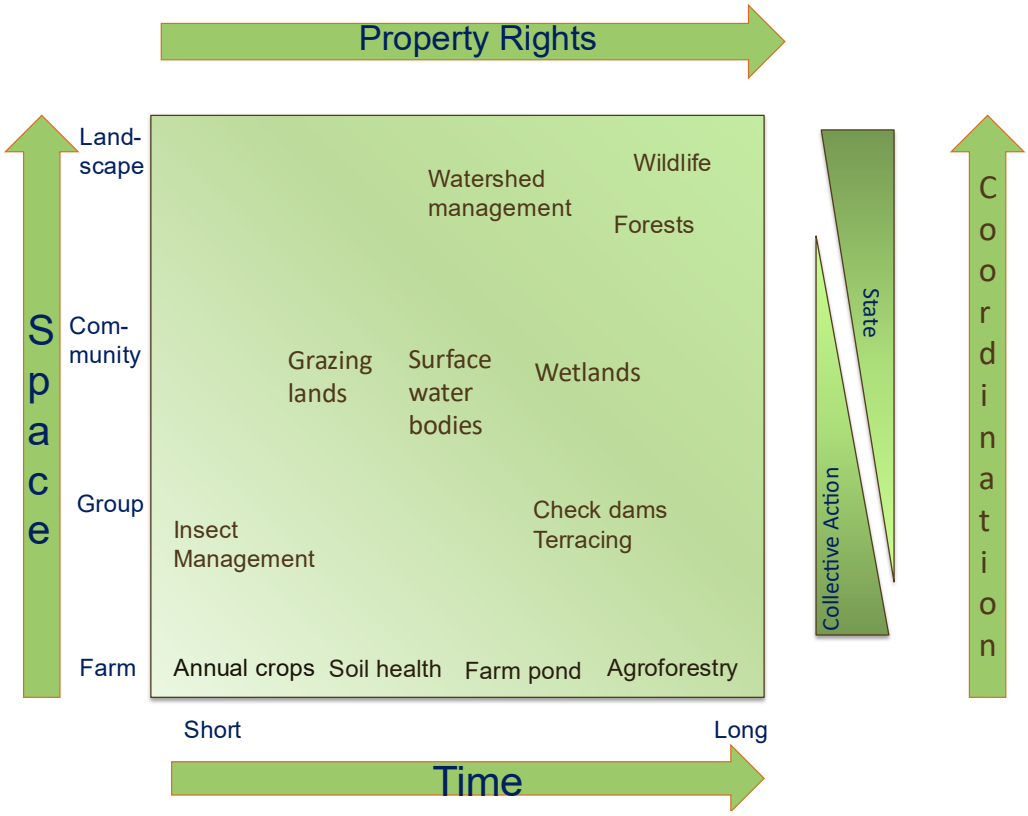

Figure 1: Scale and time frame of landscape management components
Source: Adapted from Meinzen-Dick et al. (2022).

Management of insects for pest control or pollination services is still relatively short-term, but it affects more than an individual plot or farm; hence some form of coordination is required across a group of farmers.

Moving along the horizontal axis, management of farm ponds, soil health and agroforestry are at the plot level but the investment and returns are longer term. Producers without secure property rights, and without enough resources to make the investments and wait for the returns may be unable to adopt the practices without assistance. Soil and water conservation activities like check dams and terracing are similarly above the farm level, with longer-term returns to the labor and other investments.

Other landscape components such as surface water bodies, wetlands, and grazing lands are generally at the community or higher levels, with time horizons of years to decades. Eradication of invasive species and management of watersheds, forests, and wildlife are landscape-level with returns in years to decades, involving many different stakeholders and often requiring continuous effort to maintain the desired outcome of the initial investment. These all require attention to tenure as well as governance to coordinate across actors.

Figure 1 is illustrative of a landscape. Filling this out in practice can provide a starting point for diagnosis and co-creation of institutional arrangements for landscape management. The following series of questions would allow to tailor this to a particular landscape.

1. What are the components of the landscape? For example, are there forests, water bodies, agricultural and grazing lands, etc.?
2. Who are the stakeholders for each component? This may be direct users, those affected by externalities, government agencies, and private sector.
3. What is the scale of each component? This depends on the physical area of the component and how that relates to the size of farms and communities. A forest may be a few hectares to thousands of hectares, and a forest of 10 hectares might be all within a single holding, shared by a forest user group, or a whole community.
4. What are the existing formal and informal tenure arrangements relating to each component? How do these affect incentives for its management and the distribution of benefits or costs?
5. What are the existing formal and informal institutional arrangements for coordination to manage any component above the level of the individual farm?

After reviewing the individual components, a landscape approach would then consider how these components (and their corresponding stakeholders) interact. For this it may be useful to place the components on a map of the

landscape, to identify the spatial patterns and relationships such as proximity and directionality of flows of ecosystem services or externalities (e.g., upstream-downstream relationships). Useful questions here include:

1. What are the key ecosystem services that each component provides to, and takes from, other components? For example, forests may provide fodder to farm animals.
2. What are the relationships among stakeholders of the different components? For example, are the crop farmers the same as the forest users or are they different groups? Are the interests of different groups seen as aligned or competitive?
3. What (formal and informal) institutional arrangements exist to coordinate across the stakeholders of different landscape components?

This set of questions is designed to help identify whether existing arrangements are sufficient, or if strengthening the institutions could contribute to improved condition and productivity of the individual components and the aggregate value of the landscape.

Tenure arrangements

The security of property rights in this framework depends on the tenure arrangements—the legal and customary relationships with respect to natural resources, which determine who can use the resources, for how long, and under what conditions (FAO, 2002), including the rights and obligations of the holders of these resources (Bruce, 1998). Land tenure is most prominent, but it may also be important to consider tenure over other resources such as trees, water, fish, or wildlife (Fortmann & Bruce, 1988; Hodgson, 2004). While a full review of tenure concepts is beyond the scope of this paper, in this section we identify key concepts to consider in assessing the tenure arrangements in particular landscapes.

Property rights arrangements are often classified as private, public, common property, and open access (Bromley, 1991; Feeny et al., 1990; E. Ostrom, 1990), but these are often not as distinct in practice (Berkes et al., 1989). Just as landscapes are composed of mosaics of land types and land uses, there are also mosaics of tenure arrangements. Homesteads and crop fields and agroforestry lands are often privately held, while grazing lands, forests, wetlands, and water bodies are frequently held collectively and managed as community commons, even if officially state-owned. This is particularly evident under communal tenure, where land is held by the community, with pieces allocated to households or individuals for use as homesteads and crop fields, while other land is used collectively (Bruce, 1998). Landscapes may also include public (state) property such as national parks or nature reserves.

Under private property individuals (or legal individuals such as corporations) are the primary rights-holders. These are generally found for agricultural fields, dwellings, and businesses where the inputs and outputs or benefits are largely separable and excludable.

Common property refers to property held by some type of group or community. For example, a forest may be held by a defined forest user group or by a whole community or a larger Indigenous Peoples group. Common property is often found for common pool resources, which are depletable, but it is difficult to exclude users.

Public property is held by the state, but this may be a local government body such as a municipality, or by the provincial or national government and managed by a particular agency such as the Forest Department or national park service. Public property is often associated with resources that have a broad public interest, such as roads or critical wildlife habitats.

Tenure security refers to the likelihood that the resource holders' rights will be upheld (Sjaastad & Bromley, 2000). It is not only the formal type of property that matters for the management of associated resources, but the security of tenure—the assurance that rights will be upheld. This, in turn, depends on the strength of the individuals or institutions holding the rights, and support for these rights by the state and broader society. That security of tenure shapes incentives to invest in the resources. For example, if women have formal private property rights to land but those rights are not respected by the community, their tenure will be insecure (R. Meinzen-Dick et al., 2025). Conversely, if community members have individual or household rights derived from customary tenure but these are not recognized by the state, they may be vulnerable to "land grabs" by influential outsiders. Holding property together can strengthen institutions like forest user groups to manage shared resources (Coward, 1990), but if those institutions are weak, then the collective tenure is insecure. Even when the state declares resources to be under public property, if the management entity is not able to protect the resources (such as when a forest department does not have enough guards to patrol the forest area or an irrigation department does not have the resources to maintain the infrastructure), public property can also be insecure. In each case, the resource is effectively an open access resource, which is subject to degradation. Thus, what is often referred to as "tragedy of the commons" is more accurately a "tragedy of open access" (Berkes et al., 1989).

Even under private, common, or public property, one individual or entity does not hold all rights over the resources. Different individuals, groups, and government bodies have overlapping rights to access the resource. These are often referred to as "bundles of rights" which can include use rights of access, withdrawal, and exploiting the resource for economic benefit and control or decision-making rights of management, exclusion, and alienation (including rental, sale, or otherwise transferring the rights to others) (R. Meinzen-Dick & Pradhan, 2002;

Schlager & Ostrom, 1992). It is therefore not only nominal ownership that matters, but also use and management rights, which influence and affect the quality and sustainability of the resource and the distribution of benefits.

These overlapping rights create complex interrelations among rights holders — which together constitute a "web of interests" (Arnold, 2002; Hodgson, 2004; R. Meinzen-Dick & Mwangi, 2009). Such webs of interest can be seen within a single landscape component such as a forest or wetland, but become even more prominent when we zoom out to look at the interconnections among landscape components, influencing the coordination mechanisms discussed in the next section.

Coordination mechanisms

A landscape approach implicitly assumes that there is some interest in managing the collection of multiple benefits derived across individual landscape components. While the political economy question regarding what multifunctionality means, who decides the "utility function" of the landscape, and how the decisions are made is crucial, here we focus on some of the "how" questions, assuming that the "utility function" has been plausibly defined through participatory processes such as inclusive multi-actor vision-to-action (Fuchs et al., 2025; Triomphe et al., 2024).

From the lens of economics, managing landscape multifunctionality can be interpreted as a social optimization problem capable of internalizing (positive and negative) externalities: a decision-maker, on behalf of all landscape stakeholders, would make a set of choices that maximizes the utility function, subject to relevant constraints that delineate the socio-economic, biophysical, and ecological boundaries. With "perfect" ability to implement the mathematically optimal solution, human, land, water and other resources are used or preserved in a way that delivers the first-best solution for the landscape-level objective function.

Implementing landscape approach in real life is a lot more complicated than solving a mathematic problem but thinking through the theoretical optimization problem can help point to some key considerations and research needs. For example, what engagement process and governance model is needed to make sure that the utility function and the set of constraints are defined to catch everything that matters and reflect the (sometimes conflicting) needs and preferences of all stakeholders? For example, would social inclusion and equity be included in the utility function as a desired outcome, and if yes, how much utility society does gain from this outcome? To optimize means to numerically reconcile, rank, or balance the outcomes based on the relative weights (preferences) people assign to them, accounting for the shadow prices of the constraints (scarce resources or essential conditions that bound our choices). But not everything can be measured quantitatively. For example, the cultural value attached to certain landscape components might be better captured qualitatively; social inclusion and equity might be better addressed as a binding constraint as opposed to an outcome being weighed against other more tangible outcomes such as consumption of goods and services. Economic valuation tools increasingly allow monetizing the costs of certain negative externalities (such as pollution) or the benefits of certain regulating ecosystem services (such as carbon sequestration and water filtration), but the vast majority of externalities and public good-nature ecosystem services remain methodologically challenging to value. All this is to say that not all real-world problems can be translated into mathematic optimization problems, not to mention our imperfect ability to implement the model prescribed solutions. However, improving measurement and our understanding of preferences could help move us toward a scientific way of defining and solving problems.

Coordination has a crucial role to play in operationalizing landscape approaches. In this context, coordination refers to the process of deliberate aligning the visions, actions, plans, policies, and investments of multiple stakeholders across sectors and scales within a defined landscape to reconcile competing demands, manage trade-offs and enhance synergies among various objectives (Carmenta et al., 2020; Estrada-Carmona et al., 2024; Reed et al., 2015, 2016).

Multifunctionality can be conceptually understood as a systematically built social construct regarding landscape management to achieve a balanced portfolio of landscape function-based benefits or outcomes. The scale of the problem tends to vary with where we draw the boundary for the physical landscape and landscape stakeholders. Generally speaking, the greater the heterogeneity of landscape components and their associated owners, managers or users, the greater the need for coordination; the higher the spatial scale, the greater the need for coordination.

Implementing landscape-level approaches involves diverse resource users, as well as the government and private sector organizations that are involved with those land uses, whose interests are often not aligned. This raises challenges in terms of the need to coordinate across different types of resources and different types of stakeholders. For activities among groups of farmers up to the community level, collective action can be sufficient, but at higher levels, some form of government involvement is needed, whether from local government institutions or national or provincial government departments. This includes not only the government entities that hold formal rights over public property (e.g. the national parks) but also others with strong interests in the resource, such as an environment department.

Achieving effective coordination and collaboration is far from straightforward, given the inherent heterogeneity among interest groups. Indeed, even within categories like government stakeholders, there are divergent

motivations, power structures, and spheres of influence across various departments (R. Meinzen-Dick & Singh, 2025). Thus, stakeholder analysis is an important starting point to identify who is involved (or excluded) in decision-making and analyze their interactions with different interest groups to navigate the complexities inherent in the landscape. Political economy analyses can be useful to identify the interests and power or influence of each group, for who may block or facilitate coordination, as well as to find possibilities for common ground (McKay et al., 2024).

At the local level, collective action is often important for managing landscape resources, such as developing and enforcing rules for community forests, or coordinating cleaning of irrigation canals, because external organizations such as government agencies are not as well placed to monitor or enforce rules, and people are more likely to abide by rules if they have a role in setting them. There is a large literature on the factors affecting collective action (Olson, 1965; E. Ostrom, 1990).

At higher levels, the role of the state becomes more important for coordinating action, but there can still be a role for collective action by resource users, such as through a federated structure. For example, Nepal's FECOFUN is a federation of forest user groups that operates even at the national level, coordinating across sites and advocating for policies (Ojha et al., 2016; Timsina, 2003).

The crucial question is what kind of coordination there is among the organizations (and individuals) involved at each level. While there have been numerous studies of factors affecting co-management between the state and users of individual resources such as irrigation (Asian Development Bank, 2008; Garces-Restrepo et al., 2007), forestry (Colfer et al., 2021), or fisheries (Evans et al., 2011; Wilson et al., 2003), this becomes even more complex for multifunctional landscapes, where different government and private entities are involved, along with users of different resources.

Achieving integrated landscape approaches requires engaging with diverse stakeholders with differing motivations and values to negotiate competing interests and facilitate consensus. Thus, landscape approaches invest heavily in coordination (Carmenta et al., 2020; Estrada-Carmona et al., 2024).

One common organizational response to this need for "coordination between the coordinators" is to work with some kind of multistakeholder platform (MSP). While MSPs can provide a forum for discussion and coordination, their success is far from guaranteed. Important questions relate to whether to try to create new MSPs that include the key actors in a landscape, or engage with existing MSPs that may have slightly different composition or objectives. Reviews of experiences with MSPs have identified contextual factors as well as structural aspects of the MSPs that are likely to shape outcomes (Andersson et al., 2024; Ratner et al., 2013; Sarmiento Barletti et al., 2020).

To deal with the multifunctional nature of landscapes, governance systems of successful landscape approaches provide the means of integrating decision-making and management across sectors. Since administrative boundaries often do not align with landscape boundaries, and landscapes typically display a mosaic of natural resources, polycentric governance offers a powerful solution to scale mismatches and effective landscape governance. Polycentric governance involves multiple actors and centers of authority working at different scales, both hierarchical and overlapping. Vincent Ostrom (1999, p. 57) referred to polycentricity as an order "where many elements are capable of making mutual adjustments for ordering their relationships with one another within a general system of rules where each element acts with independence of other elements."

Polycentric governance goes beyond nested or hierarchical layers, and involves multiple, semi-autonomous, decision centers that recognize shared interests and needs, and formal or informal mechanisms for cooperation, coordination, conflict resolution, competition, and information sharing (Carlisle & Gruby, 2019; E. Ostrom, 2010; V. Ostrom et al., 1961). Polycentricity thus refers to institutions that span boundaries and different actors: state, civil society, market and private actors. Developing or strengthening polycentric governance often entails providing coordination mechanisms across government departments, along with user organizations and private sector, as illustrated in Figure 2 from India.

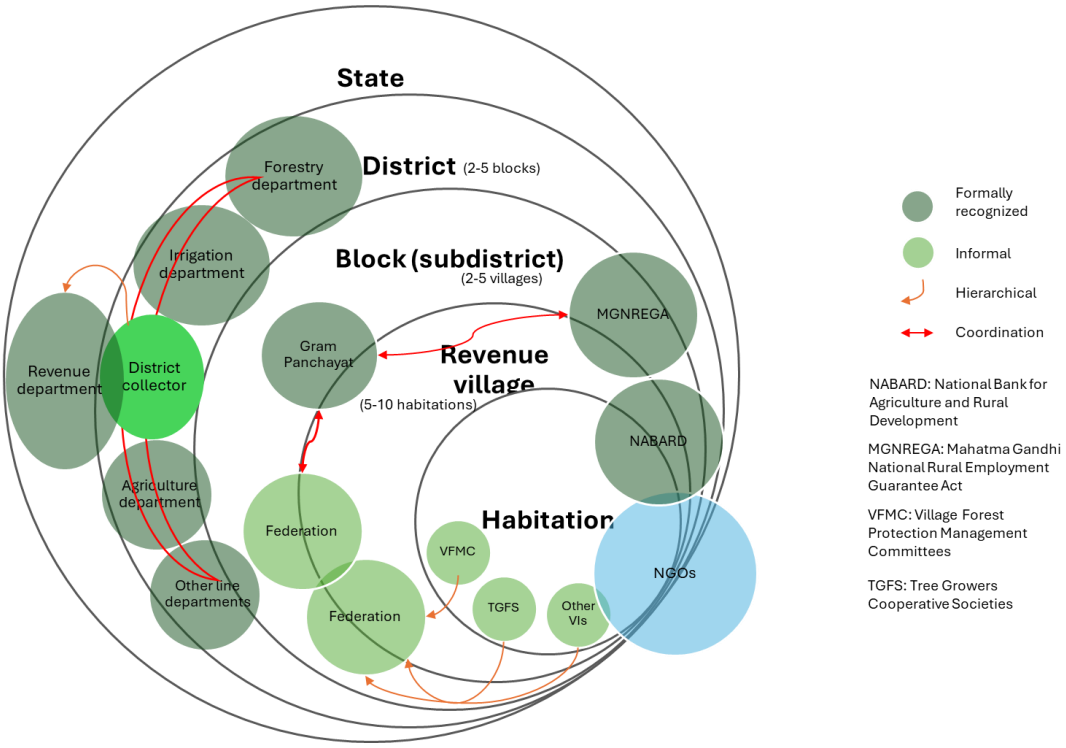

Figure 2: Illustration of polycentric governance of landscapes in India
Source: adapted from ElDidi et al. (2024)

Conclusions

In their review of landscape approaches, Estrada—Carmona et al. (2024) found that while technical approaches to landscape development focusing on either agricultural production or environmental preservation, integrated landscape approaches engage with more stakeholders, sectors, and invest heavily in coordination. This entails a longer-term view, but has payoffs: "Social justice intervention strategies enabling, specifically, tenure, equity, and culture, were associated with better performance in all but production Las [landscape approaches]" (Estrada-Carmona et al., 2024). Similarly, a meta-review of forest restoration programs in India finds that both co-management with substantive local involvement in decision-making and effective community management rights are associated with higher tree canopy cover and livelihood benefits (Fischer et al., 2025). Another meta-review of the outcomes of land tenure interventions shows a positive association of tenure security with human well-being and environmental outcomes (Tseng et al., 2020).

While there are no blueprints to address the institutional underpinnings that can contribute to more socially and environmentally sustainable landscapes, based on the discussion in this paper, we suggest the following guidance:

Start with a diagnosis of institutional arrangements, in terms of what exists in terms of tenure and coordination institutions, and what would be needed for the key landscape components and resource management practices. If gaps are identified, external programs or organizers can usefully engage with other landscape actors to strengthen those institutions, but this process needs to be viewed as an organic, not mechanistic approach—more akin to "gardening" than to "engineering" a solution.

Work to build institutions should be seen as a long-term investment, which can have important payoffs in terms of sustainability and equity.

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