Community meeting in Lanzi Village, Uluguru Tanzania. Photo credit: Miika Makela

Wambugu, S. W., Chomba, S. W., & Atela, J. (2015). Institutional arrangements for climate-smart landscapes. In Minang, P. A., van Noordwijk, M., Freeman, O. E., Mbow, C., de Leeuw, J., & Catacutan, D. (Eds.) *Climate-Smart Landscapes: Multifunctionality in Practice*, 257-273. Nairobi, Kenya: World Agroforestry Centre (ICRAF).

CHAPTER 18

Institutional arrangements for climate-smart landscapes

Susan W. Wambugu, Susan W. Chomba and Joanes Atela

Highlights

- This chapter highlights seven institutional benchmarks for achieving climate-smart landscapes
- Case study analysis shows that the benchmarks are highly contextual in practice
- Achieving the benchmarks in practice involves synergies and tradeoffs
- Optimal choices involves strategic choices such as targeting investments with knock on effects on other benchmarks

1. Introduction

"Institutions are the multitude of means for holding society together, for giving it a sense of purpose, and for enabling it to adapt" (O'Riordan & Jordan, 1999).

Landscapes are gaining policy and scientific attention as a means to addressing the multiple aspects of climate change. Climate-smart landscapes operate on the principle of integrated landscape management encompassing ecological, social and economic actions that synergize adaptation and mitigation within the target landscape (Scherr et al., 2012). In climate-smart landscapes, institutions play a central role in structuring risks and sensitivity to climate hazards. They are critical as mechanisms for enabling or constraining individual and collective responses to climate risks and hazards (Agrawal, 2010). This chapter broadly defines institutions as a system of laws, rules, norms and regulations that define, constrain, and shape actors' interactions (North, 1990; Ostrom, 1990). Ideally, institutions comprise interactions of multiple actors at various levels to formulate and implement rules and regulations or norms that shape resource use and access at the landscape level. This chapter focuses on these actors, their roles, and how they organize themselves to respond to climate change challenges in landscapes.

The analysis undertaken is mainly concerned with the performance of multi-level actor interactions in practice based on key institutional benchmarks drawn from institutional literature. It specifically aims to evaluate how present institutional arrangements of climate-smart interventions apply these benchmarks, and then suggests possible improvements that could enhance the initiatives' work in achieving climate-smart landscapes. The specific objectives of the chapter are to: 1) highlight institutional arrangements in climate-smart agriculture and forestry landscapes and 2) to apply benchmarks on institutional

arrangements, drawn from the literature, to determine the extent to which they are realizable in practice.

The chapter constitutes six sections. This brief introduction is followed by an overview of the various actors usually present in a climate-smart landscape and their roles. The third section briefly discusses the seven institutional benchmarks for climate-smart landscapes. These benchmarks are then applied in section four to evaluate the performance of ongoing climate-smart interventions within agriculture and forestry landscapes. Discussion and concluding thoughts for achieving climate-smart landscapes in practice are outlined in the last two parts.

2. Overview of institutional arrangements in climate-smart landscapes

Several actors with different roles and relationships interact within landscapes. They have different mandates and interests, capabilities and weaknesses, necessitating interactions within and across levels which are governed by laws, rules and regulations as illustrated below.

Actors and policies operating at various levels, global to local, shape climate-smart landscapes that explicitly address mitigation and adaptation. For instance, global level actors generate and disseminate climate-related knowledge applicable at global, regional and local levels. Such actors include the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) and its subsidiary bodies. Both provide platforms within which states and non-state actors design, negotiate and commit to global emission reductions. Decisions reached

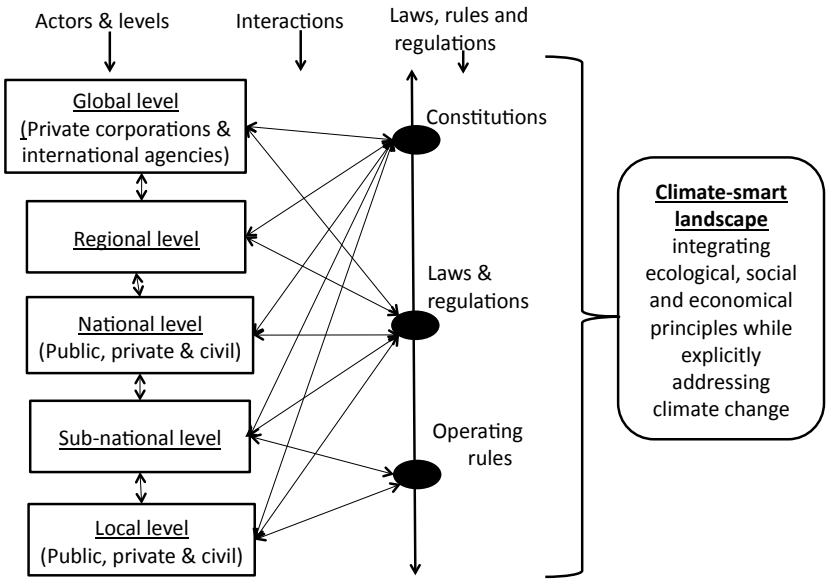

Figure 18.1 Institutional arrangements, i.e., actors and their interactions at various levels, governed by laws, rules and regulations in shaping landscapes (developed from multi-level governance perspectives and social dimensions of climate change) (Adger, 2001; Cash et al., 2006; Mwangi & Wardell, 2012; Meinzen-Dick et al., 2013).

at this level have an impact on the nature of decisions and activities at the landscape level. Furthermore, the knowledge generated forms the basis for setting up funding mechanisms by multilateral agencies such as the World Bank and UN bodies for landscape-level actions. Other global level actors include scientific bodies such as the CGIAR Consortium which generates scientific knowledge, for example, on agroforestry systems and climate-smart agriculture, often piloted at the landscape level. A host of international nongovernmental organizations have also emerged to advocate for equity and rights in climate change initiatives such as Reducing Emissions from Deforestation and forest Degradation (REDD+). In their actions, these actors provide feedback to the national and international levels through policy recommendations.

At the regional level, a number of bodies with collective policies and goals act as intermediaries between states and the international agencies. Regional bodies comprising of Non-Governmental Organizations (NGOs) such as the Tropical Rainforest Alliance and intergovernmental agencies such as the Central African Forest Commission (COMIFAC) advocate for the interests of their member states at international negotiations, but also formulate ways of addressing regional-level climate change and sustainability challenges. Such regional actors are important for addressing environmental challenges in trans-boundary landscapes such as forests, mountains and lake basins. For example, COMIFAC in the Congo Basin constitutes 10 member states, and advocates for sustainable management of forests, including issuing joint submissions to the UNFCCC on behalf of its member states. Essentially, regional networks are significant in creating synergies, building human, political and financial capital for climate actions that transcend geographical boundaries.

At the national level, government ministries, parastatals and related agencies formulate, guide and facilitate the implementation of climate and related policies at the national, subnational and local levels. Linked to the global level, these actors are critical for successfully embedding mitigation and adaptation actions to the broader national level policies, defining resources rights, e.g., tenure, trees and carbon, at the local level. There are major critiques of the institutions at this level so far including lack of coordination and weak linkages within government organizations and across different sectors, inadequate capacity for climate monitoring, funding dependency and consequent global subordination by funding agencies (Brown et al., 2010; Atela, 2013).

At the local level, institutions are critical in shaping how local communities are affected by, and respond to, climate-related challenges. They mediate individual and collective action in four critical ways: by shaping the impact of climate change and vulnerabilities of communities to climate change; by shaping the manner in which communities respond to climate change; by acting as intermediaries for external support between the local communities and the intervening agents (Agrawal et al., 2008); and by providing the medium for local representation and access to external resources. Informal institutions (denoting non-codified rules and norms, e.g., customary rules) are more prevalent at this level, and include communal regulations and norms that define access and use of key resources such as land and forests. Despite the critical role of local level institutions, they are mainly treated as recipients of climate-related knowledge in many interventions. A number of obstacles such as social resistance to change, weak governance, lack of information on climate-related disasters as well as lack of assets and insurance that can

enable them to withstand shocks are presented as their main weaknesses (Agrawal et al., 2008; Alemagi et al., 2014). Despite these setbacks, local networks (organizations as well as individuals) are increasingly becoming connected to regional and global networks, introducing new opportunities, and risks (Mwangi & Wardell, 2012).

In summary, institutional networks and collaborations at the landscape scale often involve a complex mix of the above, presenting challenges in choices (who to work with), display of power relations, bureaucratic challenges and sometimes social and cultural resistance. Despite the complexity and challenges of working across many scales and levels, such interactions have great potential for synergies. At this juncture, it is critical to note that although climate change as an explicit subject has only started being addressed by institutions in various landscapes, multiple institutions pre-existed as evidenced by different actors, rules and roles in many agriculture and forestry landscapes. The experiences from such previous interactions may help build lessons and progress towards climate-smart landscapes. In the next section, we review these lessons in the form of benchmarks, with which we assess real landscapes based on practical experiences.

3. Key benchmarks for institutions in climate-smart landscapes

Here we present seven benchmarks which are outlined in the literature as crucial in defining climate-smart landscapes. While the benchmarks cut across various landscapes (such as forestry, agricultural, urban, coastal and drylands), the variations between landscapes will determine what criteria are prioritized. Our presentation however does not imply any order of importance or that this list is exhaustive in itself. Rather, they serve as reference points which we can use to analyze institutional arrangements for climate-smart landscapes.

The benchmarks are drawn from and expanded using a variety of sources, including Eco-Agriculture Partners four 'institutional mechanisms' (Scherr et al., 2012); the six "INS" of climate-smart agriculture (Meinzen-Dick et al., 2013) and other selected literature. Subsequently, we identify indicators for each benchmark to better illustrate how they are operationalized as presented below.

3.1 Participatory and collaborative processes

Various actors ranging from government, international agencies, non-governmental organizations, local communities, and the private sector get involved in initiatives at the landscape level (Scherr et al., 2012). Bringing together actors provides the opportunity to "… negotiate priorities, [and] recognize legitimate local, regional, national and business interests" (Scherr et al., 2012). The process can also facilitate the building of partnerships, sharing of knowledge, and pooling of resources. A collaborative approach aids in building the requisite social capital necessary for ensuring the long-term sustainability of climate-smart practices in the landscape (FAO, 2013). To operationalize this benchmark in our cases, we focus on the inclusivity of the planning and implementation processes of the climate-smart practices through: a) the variety and levels of actors in the landscape, b) what levels and sectors they represent (if applicable), d) the presence and nature of local representation, i.e., descriptive versus substantive, and e) how resources, knowledge and decision-making powers are shared among the actors.

3.2 Secure tenure

The landscape as a unit of production, economic endowment and an environmental regulation unit is closely linked to property rights which define ownership and access to key resources such as land and forests (Lyster, 2011). Access to land, including clear and secure tenure, as well as historical patterns of distribution determines the ability of households to make investments on lands, contribute to their own food production and access to credit (Cotula & Mayers, 2009). For instance, access to benefits associated with carbon is largely determined by land, forests and tree tenure, as demonstrated through the case studies (see Box 18.1). In the case studies, we focus on a) clarity and security of land tenure, forests and tree tenure and b) use and access rights of these resources.

3.3 Equitable benefit-sharing mechanisms

Benefit-sharing mechanisms are important for articulating equity in benefits between actors occurring across the various levels (international, national, landscape and local) and within levels (e.g., within communities) (Luttrell et al., 2013). As value chains are created within forestry and agriculture landscapes, the associated costs and benefits of actions to actors helps to indicate climate-smart potential. This requires paying attention to equity issues crucial for checking against elite capture of benefits from marginalized groups in the society such as migrants, low castes, native forest dwellers, women and youth (Westholm et al, 2011; McDermott et al., 2013). Under this benchmark, we focus on the actual benefits-sharing mechanisms in the landscapes. Gender equity in benefit-sharing is however tackled separately (see next section, 3.4). We specifically consider the following criteria in our analysis: a) clarity and transparency in benefit-sharing mechanisms, b) equity in benefits, c) actor accountability in benefit sharing, and d) a pro-poor benefit-sharing approach.

3.4 Gender consideration

Social stratifications, and particularly those surrounding gender are key considerations in forestry and agriculture climate-smart landscapes (Leach et al., 1999). This stems from the fact that there are differentiated gender roles, rights and values that have been shown to be associated with such landscapes. For instance, land and tree tenure in societies where ownership of such recourses is along patrilineal lines compromises the ability of women to make decisions and benefit from such resources. On the other hand, significant gender differences exist in values such as collaboration, solidarity and conflict resolution among men and women (Westermann et al., 2005). In the cases analyzed, we focus on the following gender indicators: a) representation of women and youth in decision-making, b) active participation in the project activities, c) gender equity in benefit-sharing mechanisms, and d) gender-biased cultural practices.

3.5 Strategic targeting of investments

Successful achievement of a climate-smart landscape requires that waste of resources is minimized both through pooling of resources intended to meet similar objectives and putting the same resources to multiple uses along the chain of project formulation and implementation (Scherr et al., 2012). This is important for ensuring that funds are put to the most effective and efficient uses possible. Harmonized interventions create opportunities to target the same funds at initiatives with multiple, interrelated, and sustainable objectives (Visseren-Hamakers et al., 2012). This may involve channelling

various funding streams (whether public or private) through a common mechanism. Our analysis examines whether such mechanisms exist in the case study landscapes and specifically: a) whether they are pro-poor in their targeting, and b) whether funds from diverse sources are directed towards common objectives.

3.6 Monitoring and evaluation of impacts

Because there are so many objectives to be met within a climate-smart landscape, the ability to track and monitor them becomes important (Scherr et. al 2012). While the purpose of this chapter does not include developing indicators for monitoring success, we seek to gain an understanding of whether there are systems in place for tracking change over time to determine if the goals (ecological, social, economic, climate-related) are being met. We focus on a) whether there are credible verification standards present for tracking carbon fluxes, b) whether local communities participate in the monitoring of carbon fluxes, c) changes in livelihoods, d) monitoring of other goals such as wildlife conservation, and e) whether there is opportunity for continuous research and learning in the landscape. Some of these goals compete and complement each other and therefore we look at mechanisms for addressing tradeoffs and synergies at the landscape level.

3.7 Explicitly addressing mitigation and adaptation needs

At the heart of 'climate-smart' landscapes is the inclusion of mitigation and adaptation goals in the broader context of the landscape (Duguma et al., 2014). The roles of actors present in the landscape in meeting these goals need to be clearly understood. For our analysis, we focus on a) carbon sequestration, b) emissions reductions, and c) adaptation of livelihoods and the ecosystem to climate change impacts.

The following section consequently applies these benchmarks to three agriculture and forestry case study landscapes in Kenya to assess the extent to which they are considered. But first we provide an overview of the methods, and a case study box with summaries of the historical background of the individual case studies.

4. Empirical cases on institutions in climate-smart landscapes

The cases presented are based on empirical data collected using mixed methods designed under two PhD and one MPA studies conducted in Kenya between 2011 and 2014, (see Wambugu, 2012; Atela, 2012, 2013; Atela et al., 2014; Chomba, in press; Chomba et al., in press). Each individual study entailed different, but related objectives, embedding institutional research, with common findings on multiple and complex institutional arrangements in each of the cases. The authors draw from their primary and secondary data, as well as field experiences to evaluate the cases against the benchmarks.

The three case study landscapes include: the Kasigau Corridor Carbon project in southeastern Kenya, the Kenya Agricultural Carbon project (KACP) in western Kenya and the Kamae-Kipipiri project in central Kenya. Box 18.1 provides an overview of the varied ecological and social characteristics of the three projects.

Box 18.1

Brief histories and backgrounds of the three case study landscapes

Kasigau Corridor Carbon Project

The Kasigau landscape is a mosaic of dryland forests interspersed with pastoral areas and farmlands. Located in the southeastern part of Kenya, the area has historically supported agropastoralism by local communities and wildlife conservation activities (it lies between two national parks). A REDD+ carbon project was introduced in the late 2000s by a private land holding company, Wildlife Works, on its Rukinga Ranch. The project was intended to supplement ongoing conservation efforts by supporting alternative livelihoods of local communities aimed at reducing pressure on the forest, protecting biodiversity, and contributing to climate change mitigation. The project has since spread to other communal and privately held ranches in the area with the sale of carbon credits and distribution of benefits amongst various actors already ongoing. Community members have formed Location Carbon Committees (LCCs) to represent their views in the project's decision-making processes. The certified project applies the Verified Carbon Standard (VCS) and Climate, Community and Biodiversity Alliance (CCBA) standards for the credits which are mainly sold to international corporations. Private landholders get direct cash benefits (in some form of easements) as they have a contractual agreement with the project implementer, Wildlife Works, to that effect. Project costs are then deducted and the reminder is allocated between the various LCCs and Community Based Organizations (CBOs) for spending on prioritized community projects. Although the project is well known and widely cited, the State has no direct involvement in it.

Kenya Agricultural Carbon Project

The project is being implemented over a large area in a landscape in western Kenya around Lake Victoria. The area has traditionally supported smallholder farming and fishing communities and human settlements. The main crops grown are maize, beans and potatoes. There is also a protected humid tropical rainforest in the wider landscape (not covered by the project). A number of past interventions to improve farmer outcomes and productivity by state and non-state actors (such as the Kenya Agricultural Research Institute and the World Agroforestry Centre) have been implemented. The ongoing Kenya Agricultural Carbon Project (KACP) is run by Vi Agroforestry, an international NGO and supported by the World Bank. Other stakeholders include approximately 60,000 farmers, the local administration, and local CBOs. The project aims to achieve a 'triple-win' scenario, i.e., achieve mitigation, adaptation, and food security while addressing land degradation and farmer livelihoods. Certified carbon credits generated from sustainable agricultural land management practices such as agroforestry are verified using the VCS certification and partly sold to the World Bank's BioCarbon Fund. Although farmers are meant to receive direct cash benefits from these sales, these are yet to be significant as carbon prices remain low and project and technical costs are prioritized.

Kamae-Kipipiri

The Kamae-Kipipiri landscape is found in the Central Region of Kenya in the Aberdare Ranges. The mountain ranges are heavily forested and serve as wildlife habitat and water catchment areas for many of the country's larger watersheds. Much of the forest is protected but has suffered deforestation and degradation as large and small-scale farming and associated human settlements have been established. The Green Belt Movement (GBM) has worked with local

communities, and women in particular, to restore indigenous forest and plant more trees on farms since the late 1970s to protect the watersheds and improve livelihoods. It initiated a carbon project in the landscape in 2007 in partnership with the Kenya Forest Service (KFS), local community forest associations (CFAs) and with support from the World Bank. The project aims to reforest depleted areas and reduce degradation from human activities such as overgrazing thus addressing mitigation, adaptation and other landscape goals. Carbon credits generated from project activities are sold to the World Bank's BioCarbon Fund with benefits accruing to the communities in the form of prioritized development projects after deduction of project costs.

All the three projects state their focus is on achieving climate-smart practices, but the outcomes vary in different ways. To understand the ways in which the projects attend to the institutional benchmarks, we assess and present the benchmarks and corresponding indicators under each of the projects in the matrix presented in Table 18.1.

5. Discussion

The cases presented exhibit a diversity of actors from private, to state and civic, operating at different levels, i.e., from international to regional, national and local levels. The nature of activities in the landscapes also varies from wildlife and forest conservation to assisted regeneration and on-farm tree planting but with a focus on building climate-smart landscapes. In this section, we discuss the similarities as well as the differences across the three projects in addressing the seven benchmarks.

One of the key striking similarities is that all the projects are mainly planned and implemented by international and civil society organizations, while including national and local-level actors as partners. Thus we can argue that these do not represent 'home grown solutions to home grown problems' in the landscapes. This is not surprising, considering that the projects, which started either under REDD+ or the Clean Development Mechanism, are technical in nature or are designed based on technical guidelines which are beyond the capabilities of local communities. As a result, the projects exclude local communities, and sometimes even national-level actors such as in the case of Kasigau, and only engage them in the projects as participants in implementation.

Similarly, monitoring and verification of carbon, livelihood and biodiversity impacts was implemented through technical guidelines under CCBA and VCS, mainly by the project proponents, with little or no input by the communities. As such, the process remained largely technocratic and a privilege of the project proponents. An exception however was noted in the KACP, which attempted to engage farmers in carbon monitoring through the Activity Baseline Monitoring System (ABMS). However, the process, due to its technical linkage to credible verification requirements under the VCS, remained science-driven, oblique and factually subjective to the farmers. The technicalities around scientific standards of farmer sampling did not account for farmers' consent, language for understanding, raising further concerns on the credibility of information provided by farmers in the farmer evaluation forms.

All three projects had had positive indicators for pro-poor targeting either through their geographical scope, distribution of benefits, or incorporation of various other non-

Table 18.1 Comparative matrix for the three case projects aiming to achieve climate-smart outcomes in various landscapes.

Climate-smart benchmarks and indicators	Kasigau Corridor Project	Kenya Agricultural Carbon Project (KACP)	Kamae-Kipipiri Project
Participatory and collaborative processes			
a) inclusivity of actors in the planning and implementation processes of climate-smart practices	Project design was done mainly by Wildlife Works, an international private corporation based in the US. The local community was involved in planning and implementing the already designed activities.	Project design was done mainly by Vi Agroforestry, an international NGO, in collaboration with consultants from the World Bank. The local community has been involved in implementation.	Planning mainly by the NGO, Green Belt Movement (GBM). The local community has been mainly involved in implementation.
b) variety and levels of actors in the landscape	Private actors at the international level purchase credits. International agencies, regional and state actors absent.	The project includes the World Bank and Vi Agroforestry (international organizations) and local farmers. The private sector is missing.	The project includes the World Bank (international organization), the GBM (national level), and the local communities.
c) economic sectors represented (if applicable)	Wildlife; Forestry	Agriculture	Forestry
d) presence of local representation	Local communities are represented through LCCs and CBOs.	Local farmers participate in the project through farmer groups.	Local communities are represented through CFAs.
e) how resources and knowledge are shared among actors	Project information on benefit-sharing and activities communicated to the community even though community members still do not understand the accounting processes involved. The project managers have also presented the project's work to national and international stakeholders through workshops and conferences.	Project information, especially on benefit-sharing and carbon accounting procedures, not fully communicated to the local communities. The project however shares information on its work in various national and international platforms.	Project information not fully communicated to the local communities.

Secure tenure			
a) explicitly articulated ownership of land, forests, agricultural produce and carbon as resources	Ownership of land is mainly through private and communal group ranches some of which have been leased to the project. Rights to carbon are clarified and were transferred to the project through an informed consent agreement between the project and the executive board of the group ranches.	Ownership of land is mainly by individual smallholder farmers. Rights to carbon are unclear.	Forest under assisted regeneration is state-owned, while the participating communities are private small-holders.
b) use and access rights of these resources	Communities' access to forest resources is limited; particularly activities such as charcoal burning are prohibited.	Access to tree resources on private lands is uncontrolled. There is generally communal use of individual lands especially for activities such as grazing.	Communities are granted access to forest products through state CFA agreements.
Equitable benefit-sharing mechanisms			
a) are benefit-sharing mechanisms in the landscape clear and transparent in their framing?	Benefit distribution is clearly articulated in the project documents with one third distribution of revenue to project costs, individual landholders and communities respectively, but the implementation reflects complexities of factoring in costs and uncertainties of carbon markets leading to skewed benefit allocation in favour of land owners and the project at the expense of non-group ranch members.	Carbon revenue calculations are included in the project documents but not clarified to farmers. The carbon benefits are simply highlighted as a bonus because the project managers do not want to raise expectations.	Benefit-sharing mechanisms are articulated in the project Memorandum of Understandings between CFAs, GBM and KFS which are guided by negotiations and the Forest Act (GoK, 2005).
b) are they equitable?	Landholders derive the greatest benefits as they receive a contractually agreed cash payment. Communities receive the least benefits.	Farmers who are the carbon producers end up with 30% of total carbon revenue.	Communities are supported with communal projects, but it is not clear what share of carbon money is invested in these communal projects.

c) do they foster accountability among actors?	In some cases, especially with LCCs and CBOs, but the project proponent is not accountable to the local communities or the Kenyan government. Project costs are not transparent.	The World Bank undertakes review and validation exercises to ensure delivery of carbon. However the carbon accounting is done at higher management levels with no accountability checks, i.e., accountability measures mainly applied to farmer activities.	The engagement of legally functioning CFAs reasonably provide for accountability especially through state laws, but there are no mechanisms to hold CFAs to be downwardly accountable to the rest of the community.
d) are they pro-poor?	The communal approach to benefit-sharing enables inclusion of the poor, landless and immigrants to benefit from the one third of carbon revenue directed to community projects. Ranch shareholders however receive much more than non-ranch shareholders.	It is not pro-poor as there is no specific support for pro-poor assets such as water access thus making it difficult for the poor themselves to engage in project activities such as tree planting and management.	The communal project enables inclusivity of the poor in benefit sharing.
Strategic targeting of investments			
a) whether they are pro-poor in their spatial targeting	The project is being implemented in a semi-dry area that ranks among the poorest in the country	Implemented in an area that is ranked as 'moderate' in the poverty index even though some livelihood assets relevant to the project, e.g., water access are really constrained.	The project is being implemented in a highland area, endowed with humid forest resources and is relatively less poor compared to most areas in Kenya.
b) whether funds from diverse sources are directed towards common objectives	Carbon proceeds are the main source of income even though the project has established a trust fund through which other funds could be directed to adaptation.	Funds mainly drawn from carbon revenue purchased through the World Bank. No clear mechanism for attracting other funds.	Not clear.

Monitoring and evaluation of impacts			
a) credible verification standards present for tracking carbon fluxes present	The project applies VCS and CCBA standards for verification.	The VCS standard is applied in verifying the project's activities.	The VCS standard is applied in verifying the project's activities.
b) participation of local communities in the monitoring of carbon fluxes	Communities not involved in the monitoring of carbon pools.	Farmers are involved in recording activities on their farms but are not involved in the carbon accounting, arguably due to technicalities involved.	Communities provide records on the number of seedlings planted and surviving trees, but do not take part in the actual carbon accounting.
c) positive changes in livelihoods	There's an improvement relative to past interventions.	None observable at the time of the research, but some positive changes could occur with time.	Improvement in livelihoods monitored even though project faces competition from other relatively more rewarding land uses.
d) monitoring of other goals such as wildlife conservation	These are systematically monitored through aerial and ground surveys. The project standard, CCBA, requires evaluation of biodiversity and community benefits.	Changes in crop yields are monitored alongside carbon.	Socioeconomic impacts such as community projects are evaluated and reported even though the project standard is purely targeting carbon.
e) opportunity for continuous research and learning in the landscape	A number of studies have been conducted in the landscape and the project offers internship opportunities to research students.	Relatively cautious of potential negative reporting that could impede the project given the complex system within which it operates.	Relatively cautious about research activities due to past experiences with 'negative' research reports.

Explicitly addressing mitigation and adaptation needs			
a) carbon sequestration	In-situ conservation and natural regeneration of degraded areas core activities.	Carbon is generated through on-farm activities including agroforestry and soil carbon replenishment.	Carbon is generated through avoided deforestation as well as reforestation and afforestation activities.
b) adaptation of livelihoods and the ecosystem to climate change impacts	Addressed, although the focus has been on community rather than household/ individual adaptation capabilities.	Households' food security addressed as part of carbon. No funds allocated for livelihood support.	Community projects supported as part of adaptation. It is not clear how this support translates to household-level wellbeing.
Gender			
a) representation of women and youth in decision-making fora	Implicit in project documents, but representation remains low in practice.	No mechanism for gender equality in representation.	Not clear.
b) active participation in the project activities	Women and youth are involved in project activities, but no affirmative action/requirements for consideration of the same.	Mainly women are involved through groups. Participation of men and youth is very minimal.	Women and men involved. Youth involvement is minimal.
c) gender equity in benefit-sharing mechanisms	Existing tenure system (on which benefit-sharing mechanisms are based) reinforces gender bias as it is mainly patriarchal.	No mechanism in place.	No mechanism in place.
d) gender-biased cultural practices	Not observed, but high rates of illiteracy in women compared to men were noted. Also high rates of drinking illicit brews by men, leaving household burdens entirely to women were noted. Further gender research would be required.	Men have traditional rights to land inheritance while women don't, even though most farmers are women.	Not observed.

economic benefits to communities. However the level and nature of pro-poor targeting activities differed across landscapes. For instance, whereas the Kasigau Carbon project is located generally in a poor semi-arid area compared to the Kamae-Kipipiri project which is located in high-potential highlands. The later targets mainly women, who are a less economically enfranchised group, while the former targets thousands of smallholder farmers who are excluded from land ownership through complex group ranch land allocations. The KACP on the other hand targets thousands of smallholder farmers through sustainable land management practices, mainly agroforestry, as well as payments to grow trees.

Key differences among the projects were noted on benchmarks such as tenure, mode of participation, monitoring and evaluation and equity in benefits sharing. The projects worked under various land holdings, spanning from individual land holdings, to communally held lands and state-owned forests. The Kasigau Corridor Carbon project, for instance, recognized private ranches, communal land and private land. It also recognized different social groups' claims to communal lands, and incorporated poor and landless households into the project. This enabled them to draw benefits that they would otherwise foregone if the project targeted land owners in the project area only. The KACP project worked with lands that were customarily held by individual families, yet communal use of these lands was a common practice. This compromised the mitigation agenda of the project as individual commitments (such as incorporating after-harvest crop residues back into the soil) competed with communal interests (such as allowing free grazing of land).

The mode of participation and community representation also varied across the three projects, with organized forms such as LCCs, CBOs and CFAs in the Kasigau and Kamae-Kipipiri projects respectively. Under the KACP, individual households participated directly in the project. While organized forms of representation had the advantage of creating synergy and collective bargaining among the local communities, they were not guaranteed broad-based or democratic representation. For instance, in Kasigau, the initial organizations that the project chose to work with included state-sanctioned representation under chiefs and elected local authorities. However, these were soon abandoned in favour of single purpose carbon committees, the LCCs, formulated specifically to address carbon issues. The reasons for the drastic change included corruption and bureaucratic dogmas. Whereas LCCs achieved the desired project goals of prioritizing and distributing carbon revenue efficiently, the fact that they are not anchored within institutionalized structures of governance implies that they will likely not be relevant beyond the project lifetime (Chomba et al. in press.) The Kamae-Kipipiri project, on the other hand, has engaged with the community through CFAs which are legally recognized management units by the state, but powerless in negotiating benefits with the state. In the case of the KACP, however, farmers have no idea that the new project is being implemented under a 'triple win', climate-smart agriculture banner, and they assume simple continuity with past interventions.

Finally, the three projects varied in their considerations for gender equity. The Kamae-Kipipiri landscape has traditionally explicitly aimed at empowering women by providing them with additional revenue streams through afforestation and enhancing their participation in decision-making. The Kasigau and KACP projects, however, target the general community with no explicitly recognized gender considerations.

In summary, this section reveals the complexity of institutional arrangements in each of the case studies. While our benchmarks and indicators served as a comparative basis for comparing the cases, our analysis also depicts tradeoffs in achieving the benchmarks. Ideally, achieving one benchmark (e.g., globally designed credible monitoring standards) may potentially compromise other benchmarks (e.g., participatory monitoring). In our conclusions, we discuss key approaches for optimizing institutional arrangements for climate-smart landscapes.

6. Conclusions

The first approach to optimizing institutional arrangements towards climate-smart landscapes involves identifying and engaging key actors in the landscape at various levels, their interests and the competencies they avail. Even in private sector led interventions, the role of government agencies is still critical to facilitate political goodwill. Uncertainties remain where government policy contradicts project goals or where no such policy exists. Limited community input, non-inclusive project designs and mitigation-oriented standards may compromise the ability of the case projects to achieve climate-smart landscapes.

The second approach regards designing effective participatory processes. The involvement of local communities needs to go beyond mere participation as other landscape management objectives may suffer. It is important to note that individual farmers and forest-dependent communities have the right to know and be actively involved in developing such interventions, and, as such, local institutional changes and development that support these ideals must be identified and supported. Broad-based representation, with specific emphasis on gender and other marginalized groups such as migrants, forest dwellers, etc., must be anchored in institutionalized structures such as devolved local government to provide continuity beyond project interventions.

The third approach regards simplification and flexibility in project designs. According to Minang and van Noordwijk (2013), design flexibility and legitimacy are key to synergizing mitigation and adaptation and greater efficiency, effectiveness and equity in implementation and outcomes. This also applies to the design of monitoring systems, which must be simple, flexible and include other social and livelihood outcomes, and not just carbon.

Additionally, the roles of buyers and consumers of landscape products and services should ensure sustainability of their production and ensuring minimal negative consequences. Landscape products and services, varying from agricultural products such as food (from livestock and crops) and various forms of ecosystem services (e.g., water, carbon sequestration, soil erosion control, etc.), have both local and international consumers. Local buyers and consumers have a more intimate relationship with the actual landscapes, as the sustainable supply of most of the products and services, for instance food and water, directly affect them. The Kamae-Kipipiri and KACP landscapes both incorporated local consumers of landscape products in exchange for forest management (Kamae-Kipipiri) and adoption of sustainable farming practices. The Kasigau project, however, largely excluded the local communities from accessing these products and services. Whereas we have witnessed consumer strategies such as fair trade for timber, coffee, cocoa, etc. to safeguard against human exploitation and illegal activities, this is not well established in carbon schemes. Consumers should insist more on social justice for the providers of the

ecosystem products and services, to minimize undesired effects such as displacement of people to create carbon sequestration and conservation areas.

While this chapter proposes seven benchmarks which inform appropriate institutional pathways for climate-smart landscapes, we acknowledge that there is a great deal of interrelatedness among them, that these benchmarks are by far non-exhaustive, and that in achieving various projects goals, there will be tradeoffs and synergies to be taken into consideration. While priorities may be very landscape-specific, we advocate for the pursuit of benchmarks that have positive knock-on effects on others and can build upon the gains made so far.

References

Adger, W. N. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development, 13*(7), 921-931.

Agrawal, A. (2010). *Local institutions and adaptation to climate change. Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World.* Washington DC: World Bank, 173-198.

Agrawal, A., McSweeney, C., & Perrin, N. (2008). Local Institutions and Climate Change Adaptation. Washington, DC: World Bank.

Alemagi, D., Minang, P. A., Feudjio, M., & Duguma, L. (2014). REDD+ readiness process in Cameroon: an analysis of multi-stakeholder perspectives. *Climate Policy* (ahead-of-print).

Atela, J. (2012). *The politics of Agricultural carbon finance: The case of the Kenya Agricultural Carbon Project*. Brighton, UK: Steps Centre.

Atela, J. (2013). Governing REDD+: *global framings versus practical evidence from the Kasigau Corridor REDD+ Project, Kenya*. STEPS Working Paper 55. Brighton, UK: STEPS.

Atela, J. O., Quinn, C. H., & Minang, P. A. (2014). Are REDD projects pro-poor in their spatial targeting? Evidence from Kenya. *Applied Geography*, 52, 14-24.

Brown, H., Peach, C., Nkem, J. N., Sonwa, D. J., & Bele, Y. (2010). Institutional adaptive capacity and climate change response in the Congo Basin forests of Cameroon. *Mitigation and adaptation strategies for global change, 15*(3), 263-282.

Cash, D. W., Adger, W. N., Berkes, F., Po, G., Louis, L., Olsson, P., ... Young, O. (2006). Scale and cross-scale dynamics: governance and information in a multilevel world. *Ecology & Society, 11*(2).

Chomba, S. (In press). Institutional Choices under REDD+ and their implications for local democracy: Lessons from Kasigau project in Kenya.

Chomba, S., Kariuki, J., & Lund, J. F. (In press). Roots of Inequity: Tenure Arrangements and Carbon Benefits in the Kasigau Corridor, Kenya.

Cotula, L., & Mayers, J. 2009. *Tenure in REDD – Start-point or afterthought?* Natural Resource Issues No. 15. London, UK: International Institute for Environment and Development.

Duguma, L., Minang, P., & van Noordwijk, M. (2014). Climate Change Mitigation and Adaptation in the Land Use Sector: From Complementarity to Synergy. *Environmental Management*, *54*(3), 420-432.

GoK (Government of Kenya). (2005). Forests Act. GoK: Nairobi, Kenya.

FAO (Food and Agriculture Organization of the United Nations). (2013). *Climate Smart Agriculture Source Book*. Rome, Italy: Food and Agriculture Organization of the United Nations.

Leach, M., Mearns, R., & Scoones, I. (1999). Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management. *World Development, 27*(2), 225-247. doi: http://dx.doi.org/10.1016/S0305-750X(98)00141-7

Luttrell, C., Loft, L., Gebara, M. F., Kweka, D., Brockhaus, M., Angelsen, A., & Sunderlin, W. D. (2013). Who Should Benefit from REDD+? Rationales and Realities. *Ecology and Society, 18*(4). doi: 10.5751/ES-05834-180452

Lyster, R. (2011). REDD+, transparency, participation and resource rights: the role of law. *Environmental Science & Policy, 14*(2), 118-126. doi: http://dx.doi.org/10.1016/j.envsci.2010.11.008

McDermott, M., Mahanty, S., & Schreckenberg, K. (2013). Examining equity: a multidimensional framework for assessing equity in payments for ecosystem services. *Environmental Science & Policy,* 33, 416-427.

Meinzen-Dick, R., Q. Bernier, & E. Haglund. 2013. *The six "ins" of climate-smart agriculture: Inclusive institutions for information, innovation, investment, and insurance.* CAPRi Working Paper No. 114. Washington, D.C.: International Food Policy Research Institute. doi: 10.2499/CAPRiWP114

Minang, P. A., & van Noordwijk, M. (2013). Design challenges for achieving reduced emissions from deforestation and forest degradation through conservation: Leveraging multiple paradigms at the tropical forest margins. *Land Use Policy,* 31, 61-70.

Mwangi, E., & Wardell, A. (2012). Multi-level governance of forest resources (Editorial to the special feature). *International journal of the Commons, 6*(2), 79-103.

North, D. C. (1990). *Institutions, institutional change and economic performance.* Cambridge, U.K.: Cambridge University Press.

O'Riordan, T., & Jordan, A. (1999). Institutions, climate change and cultural theory: towards a common analytical framework. *Global Environmental Change, 9*(2), 81-93.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action.* Cambridge, U.K.: Cambridge University Press.

Scherr, S. J., Shames, S., & Friedman, R. (2012). From climate-smart agriculture to climate-smart landscapes. *Agriculture and Food Security*, 1, 12.

Visseren-Hamakers, I. J., Gupta, A., Herold, M., Peña-Claros, M., & Vijge, M. J. (2012). Will REDD+ work? The need for interdisciplinary research to address key challenges. *Current Opinion in Environmental Sustainability, 4*(6), 590-596.

Wambugu, S. (2012). Securing Tenure for Reducing Emissions from Deforestation and Forest Degradation (REDD+) in Kenya. Paper presented at the 'Beyond Carbon: Ensuring justice and equity in REDD+ across levels of governance', St. Anne's College, Oxford, UK.

Westermann, O., Ashby, J., & Pretty, J. (2005). Gender and social capital: the importance of gender differences for the maturity and effectiveness of natural resource management groups. *World Development, 33*(11), 1783-1799.

Westholm, L., Biddulph, R., Hellmark, I., & Ekbom, A. (2011). REDD+ and Tenure: A review of the latest developments in research, implementation and debate. *Focali report,* 2.