CHAPTER

26

The future of landscape approaches: interacting theories of place and change

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Highlights

- Theories of (desirable) change, driving (co)investment in the trajectories landscapes will take, will need to be firmly rooted in a theory of place to reduce the chance of failure and increase the likelihood of success at scale
- Common theories of place include the way all major asset types (natural, human, social, built-up and financial capitals) interact in major similarity domains
- Specific theories of change at the landscape scale can best be constructed ('co-produced') together with all stakeholders after an initial assessment and awareness phase
- Generic theories of change need to reconcile three knowledge value chains: 1) relating process- and system-level understanding to urgency and feasibility of action; 2) linking on-the-ground action and supportive policy reform to understanding as framed in multiple knowledge systems; and 3) reassessment of preferred solutions and early diagnosis of next-generation issues that emerge during implementation at scale

1. Introduction

In this chapter we come back to the full set of propositions introduced in Chapter 1 of this book. Through the preceding chapters we learned of the need to consider the full cross-scale complexity of Figure 26.1, with global change drivers interacting (generally with strong effect from the global to local scale and weak feedback from the local to global), through their national translation in development policy and its implementation, to the set of feasible landscapes, as well as the factors that determine the appropriateness of the current landscape within this range of feasible solutions.

All preceding chapters dealt, for different contexts and place, with the contrast between change as currently happening in the various landscapes in business-as-usual scenarios and patterns of change that are deemed desirable. Place is more than a geographic location and the measurable properties that are associated with it. It includes a 'sense of place' and a 'sense of identity' of the people living there, and those that trace their historical family roots there and still want to engage in its future. Landscapes contextualize farms and

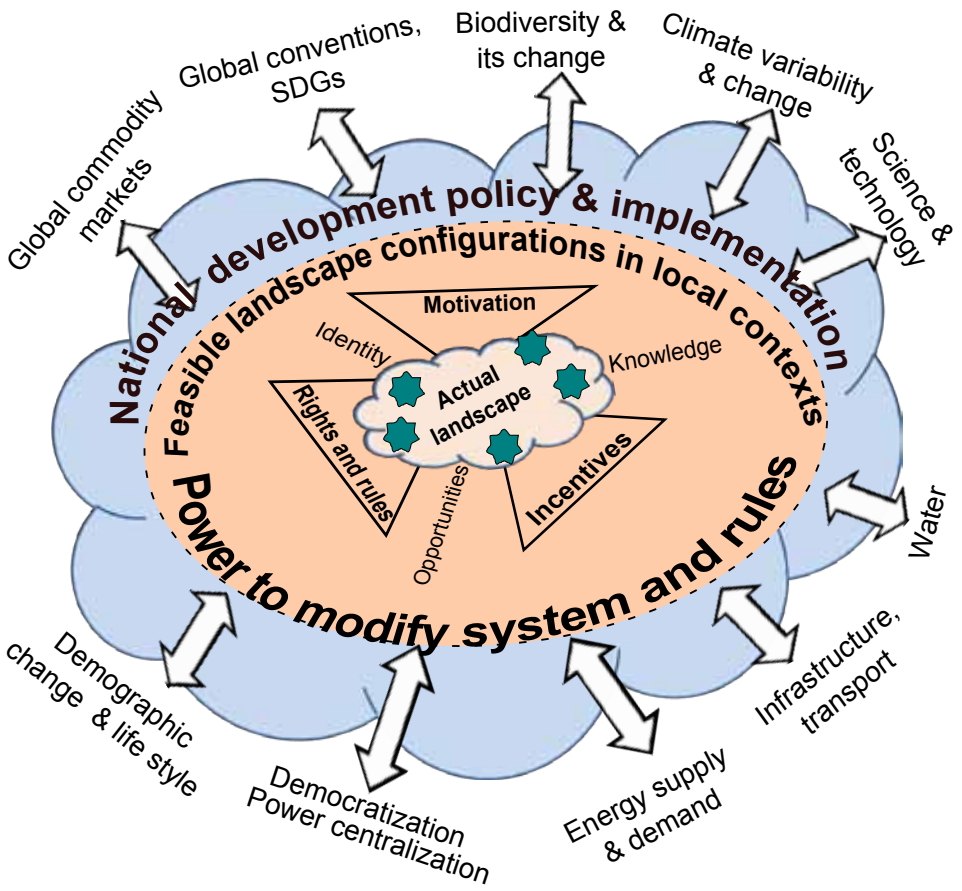

Figure 26.1 Combination of Figures 1.2 and 1.3, showing the overall complexity of the way landscapes as socio-ecological systems interact with a wider national and global system scales, as well as with households and (gender and wealth differentiated) individual livelihood strategies.

livelihood options of the people living in an area, as part of multi-dimensional change, socio-ecological resilience and adaptation to past pressures and expected future change (van Noordwijk et al., 2011; de Leeuw et al., 2013). They influence the biophysical aspects (potential land productivity, microclimate) of plots and farms, especially where lateral flows such as water, nutrients, biota or fire are involved. They also shape the portfolio of activities that provide year-round opportunities for rewarding the use of labour.

In this concluding chapter we will reflect on the way 'theories of place' (ToP) and 'theories of change' (ToC) can be reconciled on the long and winding way towards the 'sustainable development goals' (SDGs). Landscapes have been recognized as an important scale in the Convention on Biological Diversity (CBD)[1], the World Heritage Convention[2] and the European Landscape Convention[3]. Landscape approaches are now accepted to be part of the agenda for international agricultural research (see Box 26.1) and within the development agenda (see Mbow et al., Chapter 8 of this book on the SDGs). This means that beyond advocacy to get them accepted, we now need to deal with all the obstacles to make them fully functional.

The many case studies and context-based information on the practicability of climate-smart landscapes that has emerged so far is the building materials for harnessing a generic 'ToC' that aligns with current 'ToP' as a way of contextualizing sustainability. We will first discuss what has so far emerged as ToP, before relating this to ToC (see Box 26.2 for formal definitions).

Box 26.1

New directions for international agricultural research

In the October 2014 version of the proposed Strategic Results Framework for the CGIAR it is proposed that this consortium of fifteen international research centres focuses its research on three broad domains:

1. Addressing commodities within agri-food value chains
2. Managing agro-ecosystems and landscapes
3. Enhancing voice and participation of low- and middle-income countries on global issues

In doing so specific attention will be given to three cross-cutting topics of global importance:

A. Women and youth
B. Nutrition and health
C. Climate change

Box 26.2

Working definitions for theories of place and change

Theory of place (ToP): Framework for articulating, describing and analyzing the spatial and contextual aspects of current livelihoods, the business-as-usual projection of ongoing change, and the identity and sense of belonging associated with these.

Theory of change (ToC): Implementable, rational pathways aligned with documented experience, to achieve change that is deemed desirable by funders and acceptable by gatekeepers.

2. Diversity of landscapes and theory of place (ToP) (Proposition A)

The preceding chapters have provided many elements of a ToP, although this may have been largely implicit in many cases. The basic questions of physical and human geography provide a basis for any discussion of landscapes:

Who are the people making a living, influencing and associating with the place,

What are the major land use practices, and

Where are activities located (what is the spatial pattern of land use, remaining forests/wilderness, urban and trade centres) and what is the temporal pattern of change and projections of a business as usual scenario.

Beyond taking the *status quo* for granted, the actual landscape configuration is a member, and likely a suboptimal one, of the set of feasible options for local circumstances (Box 26.3 summarizes what we learned regarding proposition A).

Box 26.3

Proposition A: Current landscapes are a suboptimal member of a set of locally feasible landscape configurations

What we know well enough to act on:

A1. (see Chapters 2, 6, 9, 11, 17 and 22) Landscapes are shaped by human interactions, rather than having an absolute scale requirement. At the landscape scale, bottom-up collective action interacts with top-down governance systems. These systems typically rely on hierarchy, sectoral divisions (e.g., forest versus agriculture) and a strong jurisdictional approach to legality. Bypassing this jurisdictional level offers only short-term gains with long-term costs. Expecting jurisdictions to initiate actions will equally fail.

A2. (see Chapters 2, 4, 7, 13, 14, 15, 17, 18, 20 and 23) Perspectives on sub-optimality are likely to diverge among stakeholders. A negotiation process is essential to move outside the business as usual trajectory. Existing assessment methods relying on participatory methods can function well, but need time and resources. Suggested short-cuts don't work well.

A3. (see Chapters 2, 3, 4, 6, 7, 8, 12, 13, 20, 21 and 24). Improvements towards multifunctionality require retention of what functions well and restoration of what got lost. Current efforts are likely constrained by 1) incomplete diagnosis, 2) insufficient appreciation of consequences, 3) limited capacity to explore the full set of alternative options and interventions, and 4) ineffective shaping of coalitions for change. Therefore, an integrated process is needed to support all links in this chain.

Critical uncertainties to be resolved:

A*1. (see Chapters 3, 4, 6, 8, 9, 11, 14, 15, 20, 21 and 23) We need to better understand the politics of legal pluralism, with the local histories of place and people interacting with generic concepts such as 'indigenous people', constitution, national laws and international agreements. This cascaded interaction shapes and affects the emergence of new types of collective action that are needed for the landscape as a whole to become 'climate-smart'.

A*2. (see Chapters 13, 16, 17, 20 and 22) We need technical appraisal of multifunctionality of the full set of feasible landscapes within local constraints, and better ways to use remotely sensed characteristics in dynamic models of socio-ecological systems, with multiple feedback loops.

A*3. (see Chapters 3, 8, 10, 12, 13 and 20) We need operational metrics for monitoring the current degree of multifunctionality, matching the knowledge systems (local, public and scientific ones) and expectations of the various stakeholders, as these are still limited and in need of testing for robustness. Recent distinctions (Byerlee et al., 2014) between 'technology-based' versus 'market-based' intensification need to be further tested.

Many chapters referred to ToP that includes the way all major asset types (natural, human, social, built-up and financial capitals) currently interact. But beyond describing the current state of these assets, few considered how landscapes can be grouped in major similarity domains. Yet, a typology of similarities is important to achieve wider applications of elements and approaches that appear to work in specific examples. The similarities can be structural/compositional (ecologies) or functional depending to the way land is managed and resources used (livelihood). Both aspects are very context dependent and are usually influenced by past and current policy circumstances and institutional setups.

The 'Landcare' chapter (11) discussed a ToP in which farmed landscapes are responsible for environmental degradation in the absence of collective action for tree-based restoration of functions, but also provided a ToC of how 'Landcare' as platform for collective action can turn the situation around. The 'water-focused' chapter (13) highlighted the flows of water as an important dimension of a ToP, with proposed metrics for integrity of flow buffering, and the need for multistakeholder negotiations to overcome inconsistencies in existing sectoral policies that determine what land uses are allowed where. The 'charcoal production' chapter (14) described a ToP of where and when the use of woodfuel crosses thresholds of sustainable use, and which actions might reduce demand and/or increase supply to restore the balance. The 'gender' chapter (15) explored how gender-specific perception of space and land-use effects on ecosystem services shapes current reality, as a ToP. It also articulated that gender-specific preferences and levels of empowerment in decision-making at household and collective scales can reduce undesirable inequalities. The 'negotiation support tools' chapter (17) used a ToP in which multiple layers of geographic information systems reflect current conditions and ongoing change. It used this as a basis for a ToC in which multi-stakeholder negotiation process around visualized and quantified scenarios, as *ex ante* impact studies, assist in achieving free and prior informed consent for planned change.

3. A landscape approach as a theory of change (ToC) (Proposition B)

We here use 'ToC' in two ways: a) as a description of likely 'business as usual' change in a non-linear dynamic socio-ecological system, and b) as a backdrop for additional interventions to modify local trajectories. In a project-centric world, the b-type theories of change predominate, but are unlikely to succeed unless they are realistic about the a-type, location-specific ToC.

Success of any landscape approach intervention will usually depend on the actors/stakeholders within the landscape, their interests and level of engagement with the approach itself. To assist in the understanding of both ToP and ToC examining the following questions, beyond the who, what and where, within the context of the specific landscape can prove constructive (see Figure 26.2):

Why the drivers of current patterns, with a special interest in leverage points for nudging trajectories away from 'business as usual',

So what of the consequences of current landscape configuration and land use patterns on ecosystem services, including the provisioning services enhanced in agriculture and forest management, and

Who cares, i.e., the 'stakeholders of externalities', those affected by decisions but without direct influence on these decisions.

The dynamic landscape leaning loop (Figure 26.2) can move to a next iteration if those who care can effectively engage with the primary land users, actors and agencies involved in the 'business as usual' trajectory. Theories of (desirable) change, driving (co) investment in the trajectories landscapes will take, will need to be firmly embedded in a ToP to reduce the chance of failure and increase the likelihood of replication of successes. The relative roles of actors inside and outside the landscape of focus vary between the

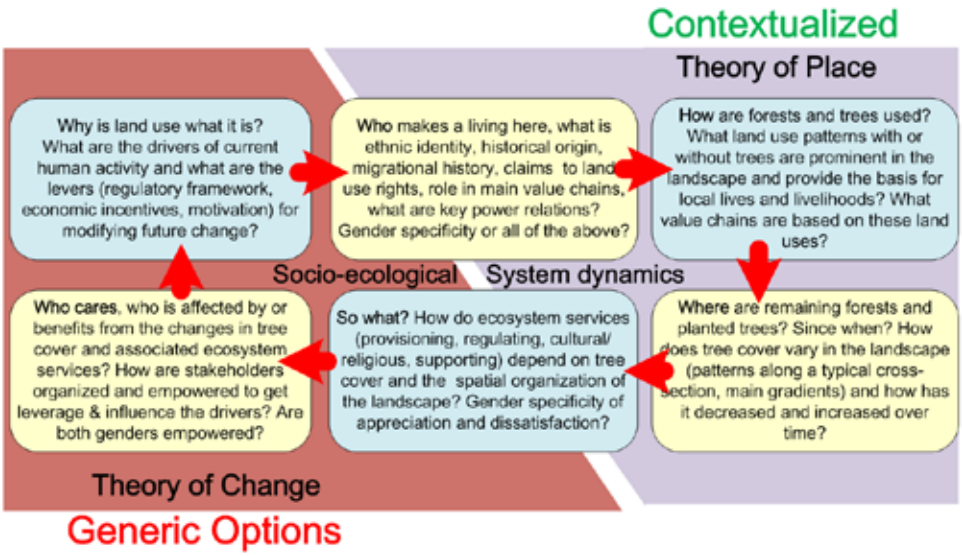

Figure 26.2 The relationship between ToP and ToC at the landscape scale are reflected through the answers to six main groups of questions (van Noordwijk et al., 2013).

cases discussed in preceding chapters. Where existing internal and external actors are associated with *status quo* and business-as-usual trajectories, the seeds for change can come from individuals or small groups inside or from those concerned about undesirable conditions and trends outside. In most cases both are needed to make a difference and form a coalition that can make a difference. Articulation of the set of SDGs (Chapter 8) can help to safeguard against hijacking the agenda of a place for an external priority; the goals formulate supposedly acceptable minimum standards for a wide range of aspects related to development and the welfare of people and the environment, globally.

At the generic level we may find a common pattern in the way issues arise from one or more knowledge systems (science, local or public) and lead to a sense of urgency, feasible targets and suggested entry points for change. Many issues may not get beyond this point of being a concern to a specific group of stakeholders, but some get wider attention and lead to the articulation of a 'specific ToC', if a broader group becomes convinced that it is important. The generic ToC can indicate what the following steps may be (Figure 26.3).

In this context, six roles can be identified for agents of change, knowledge brokers and/ or scientists:

1. Basic science of discovery, recognizing patterns, understanding system connections
2. Translating basic science to actionable knowledge on issues that appear to have urgency
3. Bringing different knowledge systems and stakeholders together in joint production of a specific theory of change
4. Piloting (e.g., in 'learning landscapes') ways to achieve desirable change, and identifying issues that deserve further attention for roles 1 and 2, and/or providing a basis for
5. Wider capacity development to broaden the basis for action
6. Supporting a broad-based political platform for change

Within the generic ToC, three knowledge value chains can be identified (van Noordwijk et al., 2014*a*): the steps from basic science to actionable knowledge, the way knowledge is linked to policy action and increased ability to act, and the broader learning loop that connects the current to future issues (see Figure 26.3).

Within this generic scheme, specific ToC's sketch a logical chain of events that can lead to desirable change, but they have to consider the many ways in which unintended private use of new opportunities distracts from the publicly stated goals. A comprehensive framework of human decision-making that includes behavioural (pico) economics, meso-scale environmental economics of financial incentive systems as well as planetary-boundary ecological (giga) economics is needed to underpin credible theories of change (van Noordwijk et al., 2012). Many chapters refer to the micro- and meso-scale, a few include the pico- and macro-scales, but the giga-scale of planetary boundaries is still heavily contested where it imposes restrictions on the sum total of anthropogenic change to the planet. Box 26.4 summarizes the experience in this book, mostly process-based, on how specific ToC, that are described as 'landscape approaches', can function.

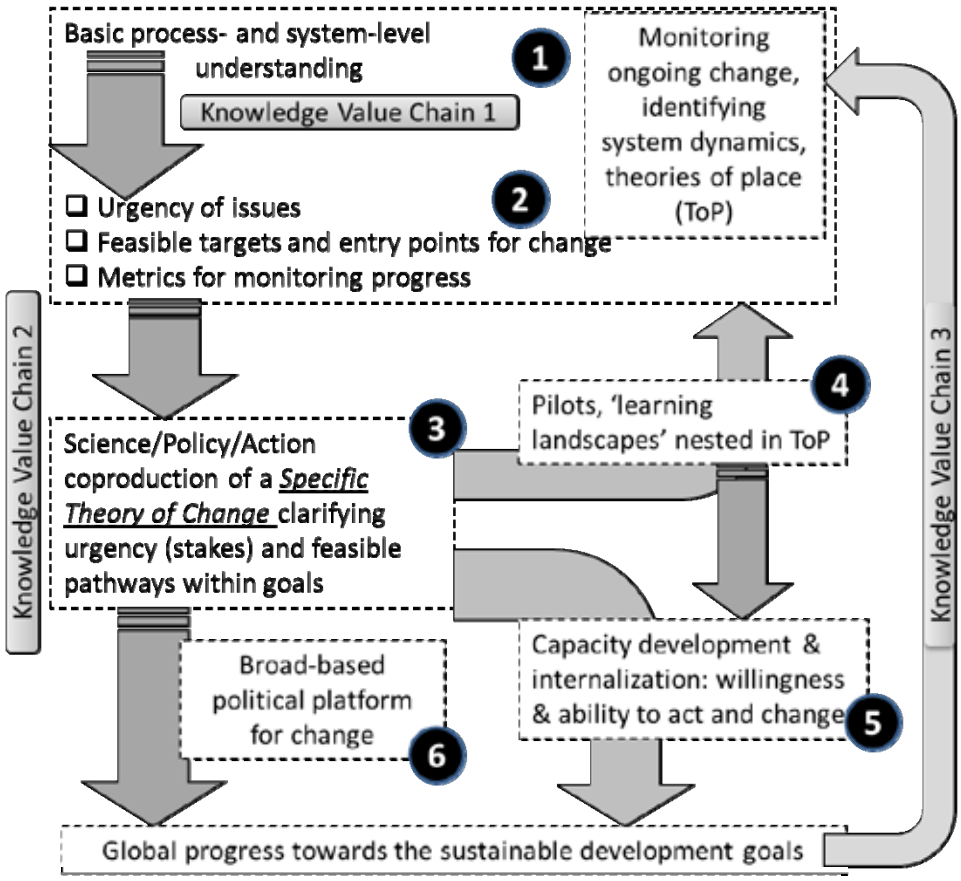

Figure 26.3 Generic ToC for global progress towards the SDGs, by combining six roles for agents of change (see text) and three knowledge value chains: 1) from generic to specific understanding, 2) from knowledge to action, and 3) from action to next-generation challenges.

Box 26.4

Proposition B: Actors and interactions can nudge landscapes towards better managed tradeoffs within the set of feasible configurations, through engagement, investment and interventions

What we know well enough to act on:

B1. (see Chapters 2, 6, 7, 9, 19 and 23) External stakeholders who engage and invest in landscapes to influence ongoing change, need to ensure moral as well as jurisdictional legitimacy, by attention for perceived fairness, empathy with local agenda's and awareness of political subtexts.

B2. (see Chapters 6, 7, 10, 11, 13, 19 and 24) When designing and implementing an incentive system for better landscape management, 'co-investment in stewardship' may be more effective than a language of payments. Balancing the basic governance instruments of rights, incentives and suasion requires full understanding of their interactions in the local context.

B3. (see Chapters 7, 8, 9, 11, 17, 20, 21, 23 and 24) The governance paradigms used at the landscape scale in balancing rights, incentives and suasion can differ from those used at national and international scales. A multi-paradigmatic approach to polycentric governance has consequences for accountability and transparency that requires specific attention.

Critical uncertainties to be resolved:

B*1. (see Chapter 5, 6, 17, 21 and 23) We need to find new ways to ensure that commitments to 'free and prior informed consent' apply to all external interventions that increase resource extraction and environmental degradation, and not only to those that support environmental services (such as Reducing Emissions from Deforestation and forest Degradation (REDD+)), as the current asymmetry favours degradation over restoration.

B*2. (see Chapters 7, 9, 15 and 18) We need to further assess individual (and often gender-specific) and collective motivation and behaviour that shapes the landscape through land-use decisions and how landscape governance instruments interact with intrinsic motivation and collective action.

B*3. (see Chapters 4, 5, 6, 7, 9, 11, 16, 19, 20 and 25) We need better tested integral planning tools, with transparency at scale transitions if a multi-paradigmatic approach is used, that relates payments at the national scale to investments at the local scale.

4. Climate-smart landscapes? (Proposition C)

As has become clear throughout this book, the current interest in 'climate-smart' landscapes cannot operate in a vacuum. While climate change provides a specific policy entry point for landscape engagement, climate is only one of the many boundary conditions for actual landscapes, and climate change one of the many driving forces that modifies the set of feasible landscape configurations. While the primary relationship between a landscape's land cover and climate at any location on earth is expected to come through greenhouse gas emissions, the more local micro- and meso-effects are gaining in recognition (Moore et al., 2012; Chapter 13). Box 26.5 summarizes the findings of the book chapters on Proposition C.

A specific ToP that has been attractive to much of the literature on climate-smart landscapes is the forest transition or tree-cover transition theory. The basic idea of

non-linear dynamics of forest cover at national or landscape scales has been around for more than 20 years (Rudel, 1998; Mather & Needle, 1998), with the empirical evidence reviewed by Meyfroidt and Lambin (2011). Byerlee et al. (2014) recently suggested that 'technology-based' intensification tends to have a land sparing effect helping to conserve forests, while 'market-based' intensification can at least locally have an opposite effect. This could be an interesting element of 'ToP' to test further, supposing that the two types of intensification can indeed be separated in practice. Meyfroidt et al. (2014) analysed the multiple pathways of commodity expansion in tropical forest landscapes and found that patterns indeed differed between commodities, urging for more empirical specificity of current generic theories.

The 'forest transition theory' has been presented as both a ToP and a ToC, depending on the spatial or temporal dimension used as its x-axis. It has proven to be a powerful rallying point for structured thinking about the wide diversity of settings global development agenda deals with, but it remains to be seen that it is a sufficiently precise framework for dealing with the specific challenges and opportunities of any place. A recent exploration of the way forest transition 'configurations' influence the way food security is achieved,

Box 26.5

Proposition C: Climate is one of many boundary conditions for landscape functioning

What we know well enough to act on:

C1. (see Chapters 3, 6, 8, 16, 18 and 25) Operational synergy is feasible at the landscape scale between climate change adaptation and mitigation (reduction of net greenhouse gas emissions). The forces that urge to keep separate adaptation and mitigation agenda's and funding streams at higher policy levels need to be challenged on the basis of track record and efficiency in reaching both goals.

C2. (see Chapters 8, 10, 12, 18 and 24) Current trends toward landscape simplification reduces landscape multifunctionality and leads to increasing vulnerability of local communities' livelihoods. These trends may need to be reversed as priority action to secure climate-smart outcomes.

C3. (see Chapters 12 and 13) Relative to current focus on changes in carbon stocks and its links to global climate change, land use effects at micro- and meso-scales on water flows, including terrestrial influences on rainfall, deserve more attention in landscape approaches.

Critical uncertainties to be resolved:

C*1. (see Chapters 3, 7, 8 and 10) We need a deeper understanding of conditions for real synergy and policy coherence and the opportunity for an integral SDG agenda to transcend the silo's that current conventions and implementation modes are building and protecting.

C*2. (see Chapters 19, 20 and 21) We need metrics that assess loss and gain of buffering of livelihoods, to be used in guiding public-private partnerships, including those that are deemed to be climate-specific.

C*3. (see Chapters 10 and 13) New ways are needed to relate landscape-scale water management to higher scale influences on rainfall and its variability, including the site-specific teleconnections.

challenged and perceived (van Noordwijk et al., 2014*b*) gives some indication that it can be used productively. Yield gap analysis can show where more efficient use of agricultural land can spare land for other functions, but more comprehensive efficiency gap analysis suggests that conventional ways to close yield gaps create other problems of resource use inefficiency (van Noordwijk & Brussaard, 2014).

Duguma et al. (2014*a*; *b*) explored how the currently segregated agendas on climate change adaptation and mitigation can move towards real synergy, but such change that seems perfectly logical on the ground at the landscape scale, faces major roadblocks at the international level. The past decade of discussions on getting 'forests' on the climate change agenda have shown that it is politically convenient to use a vaguely defined concept as a rallying point for stakeholders with multiple, and potentially conflicting interests. But to become policy-relevant, rather than politically convenient, sharp definitions and delineations are needed. The 'forest' agenda doesn't have the required definitional clarity and can only hope to be addressed as part of a wider 'landscape' approach (Matthews et al., 2014). We need to make sure that the landscape agenda does not meet a similar fate of attracting attention but not translating it to action. To make it operational those defining the modalities probably need to bite the bullet and firmly link the landscape approach to jurisdictional entities of local government, if we want it to lead to action. Despite substantial investment in 'readiness' for REDD+ implementation, there still are major gaps in connecting the links to become a functioning chain (Minang et al., 2014).

5. Discussion and way forward (Proposition D)

Drawing on a range of experience, theories, tools and methods, this book, on the whole, has argued for integrated approaches to address complex social-ecological challenges (such as climate change) within landscapes. By understanding ToP within specific landscapes an appropriate ToC can be developed to facilitate desirable multifunctional landscapes. While such processes may not always be so straight forward requiring them to be iterative and adaptive, they can still be very constructive in finding innovative and integrated solutions as demonstrated through the numerous case studies presented throughout this book.

While there is no specific formula for applying an integrated climate-smart landscape approach, there are many tools and methods which can used to assist in this process, the specifics of which will be largely context dependent (see van Noordwijk et al., 2013 for a compilation of 49 such methods and Catacutan et al., 2014 for tools with a gender focus). Box 26.6 summarizes lessons learned in the various chapters of the book regarding Proposition D, specific to the way ToP and ToC interact.

The generic ToC of Figure 26.3 provides some guidance on the complementary roles of scientists and knowledge brokers that can jointly support change – while any of the roles if weakly performed can lead to stalled processes and lack of timely actions. As the roles have rather different requirements and individuals as well the institutions that host them tend to specialize, a broad coalition of partners is needed to make progress. While some resource competition can be expected to drive perspectives that any of the six roles is more important than others and more deserving of public funding, it is only in synergy that the wicked character of the development agenda can be transformed into manageable challenges.

Box 26.6

Proposition D: Theories of change must be built within theories of place for effective location-specific engagement

What we know well enough to act on:

D1. (see Chapters 4, 7, 9, 11, 13, 22 and 23) The best way to ensure that ToP, including issues of identity and rights, inform ToC is to have early and strong involvement of local voices in any change process that is seen as externally desirable.

D2. (see Chapters 17 and 25) The tree cover (or forest) transition relationship with demography provides a useful typology of domains of landscape and livelihood similarity within broad climatic zones. It can primarily apply at subnational rather than national scales.

D3. (see Chapters 7, 8, 16, 21 and 23) Outcomes of socio-ecological system change at the process-level, e.g., through changes in human capacity and motivation, are likely to be more profound and sustainable than modified values for state variables, such as carbon stocks. Current 'results-based management' focus on what can be quantified may distract from what matters most.

Critical uncertainties to be resolved:

D*1. (see Chapters 8, 15 and 18) Building on ongoing analyses of gender specificity of landscape appreciation and preferences, further ways are needed to ensure women, youth and underprivileged groups can more effectively influence decision processes.

D*2. (see Chapters 4, 6, 7, 11, 18 and 25) New ways are needed to deal with the boundary between forest-institutional and agrarian perspectives on land and its tree cover, and to use this as a typology and framing for government resource allocations and development planning.

D*3. (see Chapters 6, 18, 19 and 21) With accountability for research and development interventions currently focused on measurable 'impact', ways to record impact on the higher-leverage aspects of dynamic systems are needed beyond the concrete metrics of state variables.

Endnotes

1 http://www.cbd.int/convention/
2 http://whc.unesco.org/en/conventiontext/
3 http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/default_en.asp

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Landscape democracy in action; community consultations in Vietnam. Photo credit: Pham Duc Thanh