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# **NAVIGATING COMPLEX TRADE-OFFS IN CONSERVATION AND DEVELOPMENT: An Integrative Framework**

by

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**Abstract:** We present a framework that makes space for multiple perspectives and ways of thinking about complex trade-off problems in conservation and development. At the core of the framework are three “integrative lenses” designed to facilitate lines of inquiry according to three unique ways of perceiving complexity. The aim of the framework is not to produce a unified theory or a model that justifies one choice over another to all audiences; rather, its purpose is to yield a more integrative and context-sensitive set of problem definitions that can open the way to a variety of pathways for action and research. The approach we present is particularly relevant in the context of highly complex problems – those involving complicated and uncertain dynamics, a multiplicity of values, a multiplicity of perspectives, and the exercise of multiple forms of power (including the power to frame the problem). We argue that setting aside the urge for synthesis—and thereby preserving enough of the complexity of the problem—can serve as a starting point for fertile and productive engagements between researchers working across disciplines, and between researchers and practitioners.

**Keywords:** interdisciplinary research, collaboration, win-win solutions, trade-offs, synthesis, complexity, framework, integrative, lenses, conservation and development, sustainability

## Introduction

From 2007 to 2010, the *Advancing Conservation in a Social Context Initiative*<sup>1</sup> (ACSC) brought together researchers and practitioners from several countries working in the areas of conservation, development, and sustainability. We were asked to address why projects that were conceived to simultaneously conserve biodiversity and promote human well-being (often via economic development) were not working as well as expected (Adams et al., 2004; Sunderland et al., 2008; Wells & McShane, 2004). Our group's starting point was to question the prevalence of "win-win" framing, in which conservation and development objectives are seen as mutually beneficial, while losses—both to people and to natural systems—are systematically under-acknowledged (Brechtin et al., 2003; Redford, 1992; Robinson, 2011; Schelhas & Lassoie, 2001). So-called "win-win" solutions have proliferated over the past few decades; ecotourism, bio-prospecting, biofuels, payments for ecosystem services and community-based conservation, for example, are often presented as win-win solutions. However, the preponderance of evidence indicates that, although these initiatives may bring about important gains in terms of some social, economic, and environmental goals, they often entail losses in terms of *other* social, economic, or environmental goals (Bailey et al., 2011; McShane & Wells, 2004; Sunderland et al., 2008). When losses are experienced where only gains were promised, the result can be disillusionment and alienation of the very people and groups whose support is essential for long-term success.

Because social, economic and environmental goals—the key components of sustainability—are often in conflict with each other, we sought to develop an approach that involves an explicit recognition of *trade-offs* that can occur between these goals (McShane et al., 2011). Our underlying assumption was that if trade-offs are indeed the norm in the implementation of conservation- and/or development- oriented programs and policies, then the explicit acknowledgement of trade-offs might serve not only to help prevent the disenchantment that can arise when initiatives fail to live up to lofty promises, but also to open a variety of productive pathways forward for both research and practice. From a research perspective, these pathways include the development of methodologies for weighing and calculating trade-offs, for understanding better how trade-offs are experienced and interpreted from

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<sup>1</sup> Funding for the ACSC Initiative came from the John D. and Catherine T. MacArthur Foundation, through a grant to Arizona State University's Global Institute of Sustainability.

different perspectives, and for highlighting the various ways in which different actors seek to influence trade-off decisions. From the perspective of practice, acknowledging trade-offs can open the way to the development of strategies for monitoring gains and losses over time, to deliberative processes for negotiating between the multiple actors involved, and to more authentic forms of engagement on the part of project participants than those available in the context of win-win rhetoric (see, for example, the discussion in Bozeman & Hirsch, 2006).

Disciplinary perspectives represented in the ACSC Initiative included ecology, economics, geography, political science, public policy, anthropology, sociology, engineering, and law. Participants included current and past staff members of leading conservation organizations and academic institutions from both the global “North” and “South.”<sup>2</sup> As a diverse group, we experienced significant challenges in our attempts at collaboration. The early meetings of ACSC were sometimes fraught with conflicts between participants about how to best understand and address complex socio-environmental problems. While we agreed that characterizing the trade-offs that occur both within and between conservation and development agendas was an essential task, as a group made up of members speaking different languages (disciplinary and otherwise), we soon realized our members saw the concept of trade-offs as implying some very different things. Some group members, for example, interpreted trade-offs as “opportunity costs,” while others resisted the definition of trade-offs in exclusively economic terms. Indeed, in some contexts and for some group members, the assumption that deeply held values are amenable to being traded off at all was seen as problematic.

As a result of these conflicts, it became clear that both a more sophisticated understanding of the concept of trade-offs *and* a new model for interdisciplinary collaboration were needed. To develop a more robust notion of trade-offs, we articulated a set of orienting principles (McShane et al., 2011), and we advocated for an approach to understanding and navigating trade-offs that is sensitive to the various dimensions of trade-off problems. These dimensions include the losses and gains that occur, the ways they are experienced and interpreted from different perspectives, and the power-lad-

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<sup>2</sup> Partner institutions included the University of Georgia Center for Integrative Conservation Research, the Peruvian Society for Environmental Law, the Sokoine University of Agriculture in Tanzania, the Center for Natural Resources and Environmental Studies in Vietnam, the World Wide Fund for Nature (WWF), the Georgia Institute of Technology’s School of Public Policy, the Center for International Forestry Research, the University of Vermont, and the Wildlife Conservation Society.

en dynamics within which problems are defined and solutions are developed (Hirsch et al., 2011).

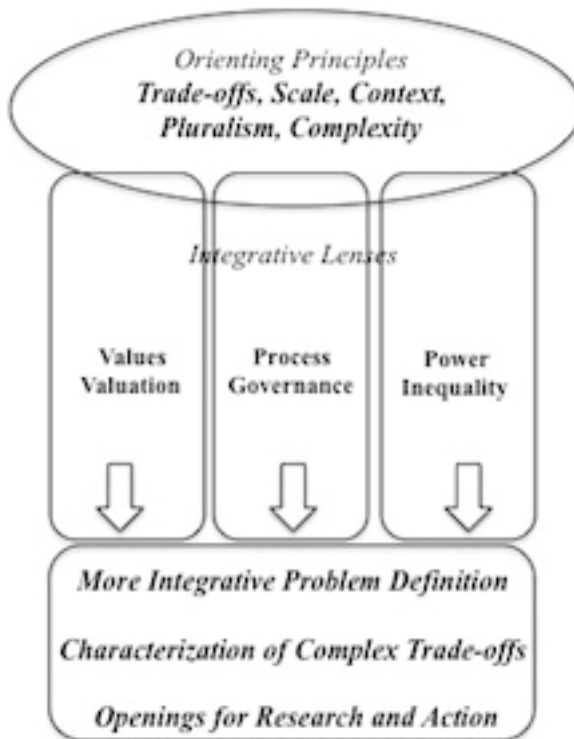
Further progress in moving from unproductive conflict to more productive engagement was made when we explicitly recognized that our efforts to understand and navigate complex trade-offs were guided by three different ways of perceiving and interpreting complexity. This recognition led us to forego the quest for a unified, synthetic *output*, and instead seek to develop a framework that can allow for an integrative *process* of defining problems and developing pathways for navigating them (Klein, 2000, 2004, 2005; Norton, 2012; for a perhaps contrary perspective, see Newell, 2001). This culminated in the development of what we came to call an “Integrative Framework.”

Below, we outline the key features of the Integrative Framework. We then discuss past, current, and prospective applications of the framework. We conclude with a review of the importance of integrative thinking about complex trade-offs within ongoing efforts to advance and understand conservation and development.

## The ACSC Integrative Framework

The ACSC Integrative Framework is a structured guide for illuminating and navigating complex trade-offs in conservation and development. The framework is organized according to three “integrative lenses” that correspond to three distinct ways of perceiving how the world works in relation to conservation and development scenarios. The three lenses—called Values and Valuation, Process and Governance, and Power and Inequality—are designed to make space for a multiplicity of perspectives and to simultaneously orient those perspectives around three sets of questions and concepts. The result is a more integrative process of problem definition that accounts for the multiplicity of issues identified and for the diverse perspectives and beliefs underlying these issues. The Integrative Framework is intended to provide openings for further research and/or action that no single perspective could yield in isolation.

## ACSC “Integrative Framework”



Semantics are important here. It is necessary to distinguish between “integrative,” a *process* of bringing separate elements together, and “integrated,” an *output* in which the separate elements are combined to yield a synthetic whole. To be integrative is to embrace the idea that any analysis of a complex problem is necessarily partial and that, further, it can be counterproductive to attempt to unify multiple perspectives into an integrated whole. Being integrative is therefore a process of *gaining perspective*, in which more details of a problem’s context are revealed.

The Integrative Framework is likely to resonate with a variety of audiences for different purposes. For interdisciplinary research groups, the framework can be used to help researchers from multiple disciplines develop compatible research agendas (Hirsch & Luzadis, 2013) by focusing their efforts on the three sets of questions. Practitioners can use the framework to develop a greater understanding of what's "at stake" from multiple perspectives, to lay the groundwork for negotiation of tensions and trade-offs, and to provide touchstones against which to observe, monitor, iterate, and learn. For those working across the boundaries of research and practice, the framework can be applied to help pro-actively negotiate the inevitable tensions that emerge by helping collaborators see themselves, their work, and their point of view as a part rather than as the whole. By making space for three very different kinds of conversations and ways of perceiving the world and its problems, and by recognizing and embracing the value of dissonance over synthesis, application of the framework can allow fertile collaborations to emerge where competition and frustration might otherwise hold sway.

Applying the Integrative Framework consists of three "phases." First, a group works to orient around a set of shared orienting principles. Participants in the ACSC Initiative developed a set of principles oriented toward widely held values and ways of thinking about current problems in conservation and development (see McShane et al., 2011). These principles are presented in Table 1, below. Other organizations and groups working in different contexts may wish to adapt the ACSC principles or to develop new guiding principles.

A second stage—a stage of parallel processing, if you will—allows for the development of insights that correspond to each lens. Each lens consists of ideas and concepts drawn from several bodies of literature, along with a set of questions designed to make space for one of three unique ways of looking at complex trade-off scenarios. The questions are phrased in ordinary language (see Norton, 2005) and are approachable from a variety of perspectives (disciplinary, organizational, cultural, etc.). Engaging with each of the lenses might entail each group member selecting a particular lens to focus on, or it might entail each group member engaging with each of the lenses. In either case, it is essential that time and space are made for each set of questions to be adequately explored without participants having to engage in the intellectual turf wars that often result when a unitary problem definition is the goal (see Hirsch & Luzadis, 2013).

Third, after the lenses have been applied in parallel fashion, the insights from one lens can be juxtaposed with insights from the others so that areas

of overlap and dissonance can be acknowledged and addressed in the formulation of a more integrative process of problem definition. An integrative problem definition will likely consist of a set of statements rather than a single statement, and ideally will provide an opening for multiple pathways for research and/or action. Crucially, an integrative process of problem definition may play a cautionary role as well. That is, to the extent that a problem can be understood in terms of complex trade-offs, the most appropriate action may in some cases be a healthy pause before moving forward with simple solutions to complex problems.

### *Orienting Principles*

As indicated above, ACSC developed a set of 5 principles to orient our work (see McShane et al., 2011), and these are presented in **Table 1**.

**Table 1. ACSC Orienting Principles**

**Trade-offs:** The basic definition of trade-off is that some things are gained and others lost. In conservation and development, trade-offs are the norm. A focus on trade-offs allows multiple actors to recognize the hard choices involved in conservation and development, the outcomes of which will change the diversity, functioning, and services provided by ecosystems and the range of opportunities available to people over space and time. More explicit acknowledgement of trade-offs and hard choices may lead to more resilient and sustainable conservation outcomes.

**Scale:** Different social and ecological values manifest at different scales, and trade-offs occur both within and between scales. Successful negotiation of trade-offs will come only with reasonable attention to political, social, economic, and ecological dynamics at multiple spatial and temporal scales, and are critically dependent on interactions across these scales. In some cases, dynamics operating at one scale may prevent or constrain successful negotiation of trade-offs at another.

**Context:** Analytical tools and methods should be applied with sensitivity to the political, economic, institutional and social contexts in which decisions about conservation and development occur. There are no panaceas or one-size fits all solutions, nor are there necessarily solutions with long-term staying power: decisions and strategies will have to be revisited as new knowledge emerges, and as the social, political, economic, and ecological contexts change.

**Pluralism:** Trade-offs are experienced and understood from a variety of legitimate perspectives. At the root of many long-standing disputes are differing models, metaphors, and ways of understanding the complexity of trade-off decisions. Each perspective highlights certain trade-off dimensions and obscures others. Better formulation of problems can occur when new ways of understanding conservation and development trade-offs are developed collaboratively and iteratively with the input of multiple voices and multiple perspectives. Diligence is necessary to ensure that the voices of all affected parties are heard, understood and respected.

**Complexity:** Human and natural systems are inextricably linked. Many important environmental and developmental issues will always involve uncertainty. All models and analytical tools for understanding conservation and development issues engage in some form of simplification of complexity, and none provide a comprehensive picture.



### *The Integrative Lenses*

Each of the lenses of the Integrative Framework views the concept of trade-offs in a distinct way. Seen through the Values and Valuation lens, trade-offs consist of gains and losses that can be accounted for by various means and methods. Seen through the Process and Governance lens, trade-offs consist of active choice processes that can be more or less democratic, more or less transparent, and so on. Seen through the Power and Inequality lens, the trade-offs concept is a framing device that can be productively used to illustrate that there are winners and losers associated with different interventions. Yet, at the same time, it can also be used in problematic ways to obscure the political dimensions of complex problems by rendering them in “objective” terms. Below, the particular mode of characterizing complex trade-offs provided by each of the lenses is further described. The description of the lenses is followed by three sets of questions designed to structure collaborative inquiry corresponding to each of the lenses, and then by a section on bringing the insights from the lenses together.

#### **Values and Valuation Lens**

From the perspective of the Values and Valuation lens, the focus is on the relevant values that may be subject to being traded off, and on the related challenges of measuring, aggregating, and ultimately comparing across different kinds of values. An additional focus of the lens is on the implications of different methods and theories of valuation for the way trade-offs are understood and navigated.

The role of temporal and spatial scale is particularly important for the consideration of complex trade-offs in conservation and development. As the ACSC Initiative unfolded, our colleague Ann P. Kinzig led the development of the important insight that the localized costs of pursuing biodiversity conservation—at least when evaluated over the short term and from the local perspective—generally exceed the diffuse and global nature of the benefits. For example, if conservation in a particular area involves foregoing the benefits of timber production, the costs of foregoing these benefits are generally seen to be higher for those living near the conservation project than those who live far away (who can presumably get timber elsewhere). At the same time, many of the benefits accrue at more macro, especially global, scales (Dixon & Pagiola, 2001; Ferraro, 2002; Perrings & Gadgill, 2003).

Whether or not the global benefits outweigh the local costs of the pres-

ervation of global goods such as the protection of endangered species or the sequestration of carbon and how one might go about determining this and even potentially reconciling the discrepancy are thorny questions that are neither easily measurable nor painlessly negotiated. Several concepts associated with the Values and Valuation lens can be used to support a process of inquiry for this kind of question. One overarching distinction is that between monistic and pluralistic approaches to valuation. Monistic approaches to valuation are those that assume that there is really only one underlying value at stake in any given decision. From a utilitarian perspective, this one value is generally understood as welfare, or happiness. Monistic approaches to valuation have a certain advantage in that gains and losses can be easily weighed against each other, because they are gains and losses in terms of the same kind of value (e.g. Arrow & Debreu, 1954). An example of a monistic approach to valuation is total economic valuation (Freeman, 2003; Costanza et al., 1998), which attempts to represent all environmental values in monetary terms.

A key consideration in monistic approaches to valuation is the choice of spatial and temporal discount rates, which are typically used to compare costs and benefits across different time periods and/or spatial units (e.g. local, national, and international levels). There are widespread disagreements about the appropriate choice of discount rates among valuation experts, in particular for policies and programs that deal with medium to long-term conservation and development issues (Zia, 2013).

In contrast to the monistic valuation approaches, value pluralism takes as a starting point the assumption that a multiplicity of values are relevant in conservation and development decisions, and that these different values may be incommensurable—that is, they may not be feasibly or meaningfully reducible to a common measure or metric (see Norton, 1994; 1995; Norton & Noonan, 2007). From the standpoint of value pluralism, values such as animal and human rights or the integrity of communities and ecosystems may all be considered to be important, and they are not presumed to be reducible to a common measure. Multiple criteria analysis, mediated modeling, and participatory decision-making approaches are sometimes used to clarify value trade-offs across pluralistic values under different courses of action. Complex value trade-offs may also be reflected in fundamentally different ways that people view and think about the environment, natural resources, and communities (Paolisso & Chambers, 2001; Schelhas & Hitchner, 2012).

## Process and Governance Lens

From the perspective of the Process and Governance lens, the focus is on the range of processes by which different voices and perspectives are engaged in making hard choices about complex trade-offs. The context of this focus consists of the multiple scales of governance within which these processes are embedded and that may serve to support or constrain or guide them.

Several distinctions and concepts help elucidate the Process and Governance lens in light of its application to complex trade-offs in conservation and development. Herbert Simon (1979) introduced an important distinction between *substantive* and *procedural* forms of rationality. A substantively rational approach to navigating complex trade-offs would involve identifying desired goals and analytically determining the best means to reach them. To the extent that goals related to conservation and development may change over time and are dependent on specific contexts and people—both of which are also in a constant state of change—substantively rational approaches to conservation may be insufficient (Simon, 1979; O’Neill et al., 2008; Norton, 2012). Thus, the Process and Governance lens focuses on procedurally rational approaches, which place the focus on finding the most appropriate set of procedures for a group of people to discuss the hard choices before them, to negotiate a decision, and to adapt as new information becomes available.

An important emphasis then, in the context of complex trade-offs as seen through the Process and Governance lens, is on finding ways to involve and engage the public and to nurture the emergence of a sense of the public interest. Barry Bozeman, building on the work of John Dewey, defines the public interest as “a contextual and pluralistic good, one constructed in each policy and problem context by a democratic public committed to the cooperative and deliberative process of experimental social inquiry” (Bozeman, 2007, p. 110). The public being faced with a particular set of complex trade-offs, of course, may not view itself as such – there may be dissonant and competing voices, speaking from different and competing world-views and ideologies. Depending on the decision context, therefore, procedures for fostering communication (across scientists, policy makers, and citizens) and mutual learning may be as important as—and in some cases more important than—the role of formal decision-making bodies.

Clearly, where biodiversity conservation is being pursued in contexts characterized by poverty or other forms of vulnerability, work must be done to ensure that any decisions that are made are followed through and

supported by relevant governance institutions. Different governance and institutional design configurations in a political system can lead to different policy choices and trade-offs (e.g. see Ostrom, 1990; Habermas, 1998). Democratically anchored governance systems arguably generate “fairer” collective outcomes, at least in the procedural sense (e.g. see Haas, 2004; Zia & Koliba, 2011). Furthermore, decision-making processes that are not democratically anchored lack the good governance criteria of legitimacy and public accountability. With the onset of the information era, an emphasis on transparency and related governance processes has recently focused attention on “full disclosure” of the actors who participated in a given decision-making process.

### **Power and Inequality Lens**

From the perspective of the Power and Inequality lens, the focus is on how complex problems are understood, framed, and spoken about against a background of historical and structural inequality. Some analyses of power focus on coercion: the ability of some actors to coerce other actors through the potential or actual use of physical, financial, or other forms of force. This form of power is *explicit* and easily identifiable; it includes, for example, the enforcement of conservation area boundaries with armed guards or the restriction of subsistence activities in specific areas. While we see such power manifested in many conservation contexts, it is only part of the story. *Implicit* forms of power are often exercised *outside* of the actual conservation site and occur as well. These include, for example, applying reserve selection algorithms to “maximize” biodiversity, making maps of protected areas or eco-regions that exclude human use, establishing monitoring and evaluation frameworks for conservation “success,” or using decision-support tools that address conservation goals through monetary valuation. While multiple forms of power are relevant, the Power and Inequality lens is particularly attuned to these types of *implicit* power.

Several concepts underlie the Power and Inequality lens that highlight how the production of inequality is the inevitable product of uneven power relations. While the treatment here is brief, each of these concepts corresponds to central areas of scholarship in critical theory. Agency is “the ability to act or perform an action” (Ashcroft, Griffiths & Tiffin, 1995), which is the result of differentiated resources that individuals and institutions possess. A key purpose of the Power and Inequality lens is revealing who decides what the field of relevant (or irrelevant) actors or agents in a conservation and

development trade-off scenario will be. Hegemony refers to the idea of domination by consent, or how dominant interests produce and maintain the status quo through the production of particular norms in society that are seen as inevitable or natural (Ives, 2004). Viewed in this way, the most effective forms of power are those through which people are not coerced, but instead participate willingly in their own domination.

The contemporary idea of discourse goes beyond a literary definition and instead includes the ways in which understandings about the world crystallize into narratives, institutions, and practices that are maintained or contested by various groups (Foucault 1973, Escobar 1995). The idea of discourse is premised on the notion that all categories (wilderness, biodiversity, ecosystem services, etc.) have histories that were shaped by power relations. Seeing who sets the terms of the debate about what constitutes the world through discursive practice is a key concern of the Power and Inequality lens.

The power to define dominant discourses is often asserted and bolstered by claims of knowledge about a particular issue or context. Critical understandings of knowledge are premised on the idea that all knowledge is political and that every perspective, even those claiming to be neutral and objective, is partial (Forsyth, 2003; Haraway, 1988). Challenging the idea of objective knowledge need not imply that there is no reality. Rather, it entails questioning how knowledge is produced, who is empowered to produce it, how it circulates, and how some kinds of knowledge are taken to be authoritative while others are marginalized (Eden, 1998; Goldman et al., 2010). It further entails asking how some forms of knowledge are seen as credible by certain categories of actors and contested by others. From this perspective, knowledge itself must be regarded as intrinsically political.

Finally, the Power and Inequality lens draws from Spanish economist Joan Martinez-Alier, who posed a deceptively simple question: “Who has the power to simplify?” (2002, p. 271) Recent scholarship has shown how economic formulas, maps, and other forms of aggregation and visualization reinforce certain configurations of power through their ability to simplify and make legible the messiness of local complexity (Scott, 1998). In other words, complex problems are reduced to particular elements that various actors and institutions can understand and make compatible with particular goals and management methods.

## Questions to Elicit Multiple Perspectives

The analysis of complex trade-offs through each of the lenses entails applying a range of questions to the conservation and development trade-off scenarios we observe. The questions are presented below in Table 2. These questions are useful in several contexts, but may not be universally applicable; any researchers or practitioners using the Integrative Framework may potentially need to add some questions and remove others.

**Table 2. Questions to Bring in Multiple Perspectives**

Values and Valuation Questions	Process and Governance Questions	Power and Inequality Questions
<ul style="list-style-type: none"> <li>• What is important and how can it be counted?</li> <li>• Whose values or perspectives count?</li> <li>• What are the key values that orient the decisions and actions of the different actors involved?</li> <li>• What fundamental differences exist among actors in the nature of their approaches to value and valuation?</li> <li>• How are different values measured and aggregated?</li> <li>• How might values be prioritized and compared?</li> <li>• Which values can be put into common units of measure?</li> <li>• Which values may be difficult or impossible to measure, compare, or prioritize?</li> <li>• What issues arise when comparing values across different conceptual and cultural contexts?</li> </ul>	<ul style="list-style-type: none"> <li>• Whose voices need to be included, and how can they be?</li> <li>• How do existing procedures, institutions and structures of governance shape the way problems are identified and negotiated?</li> <li>• What processes are currently in place for identifying and negotiating trade-offs?</li> <li>• How do existing processes and procedures include (or exclude) different perspectives and values?</li> <li>• What possibilities exist for deliberating across multiple perspectives and ways of knowing to clarify and negotiate trade-offs?</li> <li>• What is the role of various institutions, including governance institutions, in supporting or constraining the outcomes of deliberative processes and negotiations?</li> </ul>	<ul style="list-style-type: none"> <li>• Who is defining the issue or problem?</li> <li>• How do different actors frame what the key issue or problem is?</li> <li>• What are the explicit and implicit forms of power that influence decisions?</li> <li>• How might certain interests be rendered invisible?</li> <li>• What possibilities exist for embracing complexities and making the role of hidden power more transparent?</li> <li>• Who pays the costs of trade-off decisions, and who benefits?</li> <li>• What forms of inequality are relevant for understanding and negotiating trade-offs?</li> <li>• How is power embedded in certain forms of knowledge, tools, and methods?</li> <li>• What political or institutional interests may shape or influence conservation and development initiatives?</li> </ul>

### *Integrative Problem Definition and Pathways for Engagement*

By articulating multiple perspectives through the integrative lenses, one can explore different assumptions, concepts, and ways of thinking about complex conservation and development trade-off scenarios. This process is

intended to result in fuller and more integrative problem definitions. Such problem definitions, furthermore, can serve to open multiple pathways for engagement that may not have otherwise been considered. So what might these pathways look like? As we know, the way a problem gets defined shapes the range of possible solutions. We consider briefly the pathways for engagement that may be opened through each of the lenses.

Defining a complex trade-off problem from the perspective of the Values and Valuation lens may yield a problem definition that opens the way for conservation-related values to be incorporated into regulatory and incentive-based mechanisms for solution building and ongoing management (e.g. payments for ecosystem services, pollution taxes, cap-and-trade systems, permit markets, compensation payments and offsets). Monistic approaches to valuation may clarify the need for further cost-benefit analysis or techniques for clarifying trade-off decisions. Pluralistic approaches to valuation may highlight the opportunity for multi-criteria analysis, mediated modeling, and participatory decision-making approaches to be used in clarifying value trade-offs across multiple values and scales. Furthermore, answering the questions that correspond to the Values and Valuation lens may open the way to the development of strategies to inform stakeholders with the necessary information for decision-making, help create a basis for understanding different values and how they affect people at different scales, help put numbers to certain values where it is important and necessary to do so, and play a role post-decision-making to keep track of the impact and effect of the decision through audits, evaluations, monitoring, and adaptive management.

Defining a complex trade-off problem from the perspective of the Process and Governance lens may yield a problem definition that opens the way for a wider range of stakeholders to be engaged in a particular decision process or for a process to be re-designed such that it is more likely to provide a forum for the authentic engagement of diverse perspectives. If the inquiry into the role of more formal governance institutions identifies a gap between deliberative decision-making and the structures of government authority, the importance of addressing complex trade-offs at national or even international levels may be highlighted. If the gap is understood to be between decision makers and scientists, then the development of “boundary organizations” to strengthen the science-policy interface (e.g. see Guston, 1999) may facilitate the negotiation of trade-offs across different organizational and institutional boundaries. At all levels, the Process and Governance lens may serve to highlight issues of accountability and legitimacy that need to be addressed. Finally, strategies to encourage social learning may emerge

from the application of the Process and Governance lens.

Analyses which draw on the concepts that underlie the Power and Inequality lens often frustrate conservation and development practitioners because they are not perceived as constructive (Brosius, 2006). While the other lenses of the Integrative Framework are premised on a faith in the possibility for achieving fair and equitable outcomes in complex conservation and development trade-off scenarios, the Power and Inequality lens embodies a much more skeptical perspective. Imbued as it is with the recognition of the ubiquity of implicit forms of power, this lens regards the very effort to negotiate trade-offs as a power-laden process that will inevitably privilege some actors at the expense of others. This leads to a certain reticence to engage with any form of valuation or governance-based solution that involves simplification, aggregation, or commensuration. This skepticism and reticence inevitably frustrate those who are eager to make progress in negotiating conservation and development trade-offs, and who often see the critical approach exemplified by the Power and Inequality lens as unproductive, or as tending towards paralysis. In response, proponents of a critical perspective would contend that attempts to navigate complex trade-offs *without* due attention to the kinds of issues highlighted by the Power and Inequality lens may serve to more deeply entrench the dynamics that threaten ecosystems and perpetuate inequality in the first place.

In terms of opening pathways for research, methods relevant for further articulating these dimensions of complex trade-offs include ethnography, discourse analysis, and community-based participatory research. In terms of action, while it may be difficult to change or challenge established power dynamics (particularly for those who are embedded in them), attention to the dynamics of implicit power need not produce paralysis. Rather, we view this as providing a clearer pathway to engagement by a) making power dynamics more explicit and thus more transparent, b) providing awareness of unintended individual or institutional complicities in power dynamics, c) resisting forms of simplification that may serve to privilege some views and interests over others, and d) promoting a more reflexive approach that facilitates better understanding of how the methods and categories one applies to complex problems are not only intellectual choices but have implications for supporting or challenging existing configurations of power.

## Applying the Integrative Framework

To date, the Integrative Framework has been deployed to organize col-



laborative efforts around particular trade-off scenarios including steep slope development in Macon County, NC (Vercoe et al., forthcoming); the debate around the Inambari Hydroelectric Dam proposed for the Peruvian Amazon (Ráez-Luna & Dammert Bello, 2012); the analysis of alternative conservation and development scenarios for national Parks in Tanzania and Vietnam (Zia et al., 2011; Zia et al., in preparation); and the synergies and conflicts between biodiversity conservation and poverty alleviation in Cat Tien National Park in Vietnam (Anderson et al., 2012). It has also been used to structure programs in Integrative Conservation in both K-12 and graduate settings and as a tool for conservation practitioners wishing to better engage with local stakeholders in the communities in which they work. Below, we outline four examples of the application of the Integrative Framework.

First, the Integrative Framework was used by research associates at the Peruvian Society for Environmental Law to structure an analysis of the process of promotion, contestation, and ultimate failure of the Inambari Hydroelectric Dam project in the Peruvian Amazon. This was one of the emblematic socio-environmental conflicts during the government of Alan Garcia (2006-2011). If constructed, the dam would have been the largest investment in Peruvian history, and would have had unprecedented social and environmental impacts in the Peruvian Amazon. Many sectors of the government supported the project. Brazil was to supply much of the financing, and most of the energy would be exported back to Brazil. Citizens' collectives, settlers who would be impacted by the project, and some local and regional authorities advocated against the project. After a long political, social, and legal process, the Peruvian state halted forward progress on the project. The three lenses of the Integrative Framework were used to investigate a) the values related to the promotion of the project and the resistance to it; b) the procedures and institutional frameworks that shaped the process; and c) the exercise of power by the different involved actors to achieve a favorable outcome for their interests.

Second, the Integrative Framework is currently being used by researchers from the University of Georgia and the USDA Forest Service in a two-year ethnographic research project entitled "Social Acceptability of Bioenergy in the U.S. South," which is funded by the U.S. Department of Agriculture's Agriculture and Food Research Initiative (AFRI). Because of the multiple values and perspectives at play across the landscape of the southeastern U.S., it is critical to analyze bioenergy development broadly, taking into account diverse values, governance processes, and equity concerns. The main objectives of this research are to a) identify the range of regional stakeholders; b) document the

ways that different components of bioenergy systems are valued; c) identify policies, procedures, and institutions that influence bioenergy development; and d) identify how different stakeholders shape the processes of bioenergy development (Schelhas & Hitchner, 2012; Hitchner & Schelhas, 2012). This research takes place in forest-dependent communities in the southern U.S.—places where there are multiple demands on forests and that, while often on the economic periphery, have internal racial and class-based tensions. Ongoing research has revealed multiple ways of seeing and valuing forests, their uses, and their importance in rural landscapes. For example, some actors fear that additional forest uses will lead to deforestation or degradation of forest ecosystems, while others assert that markets for forest products keep land forested. Other trade-offs were revealed when a renewable energy generation project designed to maximize local economic benefits in a minority community was opposed due to air quality and environmental justice concerns. The Integrative Framework also calls attention to the dynamic processes by which bioenergy is being promoted by highlighting the ways that dominant actors and alliances advance their interests while excluding other concerns and actors. Examining bioenergy through multiple lenses may facilitate more thoughtful discussion among various stakeholders and guide managers and policy makers by elucidating the beliefs and values that underlie public opinion, clarifying trade-offs and synergies embedded within bioenergy development, and suggesting ways to negotiate this social complexity.

Third, the Integrative Framework serves as the organizing structure for an Integrative Conservation Ph.D. program at the University of Georgia.<sup>3</sup> This program has two core courses that students are required to take. The first introduces them to the principles of integrative thinking and spends several weeks on each of the three lenses. Students learn to appreciate the kinds of insights that each lens can provide, which helps them begin to understand how their own perspectives are only partial. The readings and class discussions are designed to foster mutual respect and engagement across disciplinary lines. The second core course challenges students to apply the Integrative Framework to a real conservation issue, while working with local stakeholders, government officials, and NGOs or interest groups. This process emphasizes working across knowledge domains in an iterative way. Using the Integrative Framework helps ensure that as the students are learning about interdisciplinary collaboration and working with partners outside of academia, they are critically reflecting on their own disciplinary biases (how research questions are designed, what counts as data, etc.) and on the

<sup>3</sup> <http://cicr.ovpr.uga.edu/education/doctoral-program-in-integrative-conservation/>

challenges inherent in collaborative processes.

Fourth and finally, the Integrative Framework is helping conservation practitioners develop improved methods for understanding the context, the stakeholders and actors, and the trade-offs within conservation projects and programs. The framework provides improved guidance in the research and analysis that are needed in the design of a conservation project as well as in thinking about who, how, why, and when different sets of actors engage in conservation work and/ or are affected by it. In addition, the Integrative Framework is being shared more widely across the conservation community to see how it might help in strategy selection and design, as well as in reviews and evaluations of projects and programs. Both the Center for International Forestry Research (CIFOR) and the World Wide Fund for Nature (WWF) have used early versions of the Integrative Framework in their guidance materials for evaluating trade-offs and for engaging stakeholders.

## Conclusion

Many of the conservation and development issues we face today involve thorny questions of politics and social complexity, land tenure, markets, and structural threats far-removed in space and time. Over the last several decades, the threats to people and nature have moved from straightforward, local, and immediate to distant, indirect, and cumulative. In reality, rather than indicating a change in the scope of the challenges, the difference reflects a growing and more sophisticated understanding of our complex and ever more crowded globe.

The Integrative Framework provides a conceptual architecture that “makes space” for multiple perspectives and ways of thinking about complex problems and trade-offs. The application of the Integrative Framework is best understood as part of an iterative and reciprocal cycle of reflection and action. The starting point of such a process is the assumption that a single and final understanding of a sufficiently complex issue is inherently over-simplistic. By articulating multiple perspectives through the integrative lenses, those involved in a research and/or practical endeavour can explore different assumptions, concepts, and ways of thinking. Ideally, the multi-perspective process allows for different views and voices to be equally expressed in the search for understanding and addressing trade-offs and complexity. As a result, the way can be opened both to the generation of new insights and to the selection of actions that reflect and build on them.

The Integrative Framework is applicable to complex problems that tran-

scend disciplines, boundaries, scales (both spatial and temporal), organizations, cultures, and values. Conservation and development practitioners have long recognized that the problems they are working on require trade-offs. They also recognize that a variety of views, perspectives, institutions, approaches, individuals, societies, and relationships need to be understood along with the biophysical considerations in order to better integrate conservation in its social context and appropriately design and define positive action. The Integrative Framework is intended to result in better problem definitions, improved communication, the formulation of better research, and ultimately outcomes that are more resilient and robust.

Win-win solutions that both conserve biodiversity and promote human well-being have made promises both locally (well-being) and globally (global conservation priorities) that are rarely realized, resulting in a general disillusionment with conservation and development interventions. We believe that trade-offs and the hard choices they entail are more the norm. The key challenge faced by any approach to advancing conservation that acknowledges both gains and losses, and that attempts to uncover how those gains and losses are understood and experienced from a variety of perspectives, is to avoid paralysis. The last thing anyone needs is an approach that leads to people throwing up their hands in resignation. Yet while the call to action should indeed be heeded, it should also be recognized that many actions could serve to make complex problems worse. Indeed, it is a goal of the Integrative Framework to better address, and ideally prevent, just this possibility, resulting in a more open and just set of pathways forward along with ongoing recognition of what is being traded off, and how gains and losses are experienced from the different perspectives involved.

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