8-2015

Governance criteria for effective transboundary biodiversity conservation

Michelle Mei Ling LIM
Singapore Management University, michellel@smu.edu.sg

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ORIGINAL PAPER

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Michelle Lim[1]

Abstract Intact ecosystems across jurisdictional boundaries are of growing importance as the world continues to experience the impacts of climate change. International boundaries have, however, been drawn for political rather than ecological reasons. Ecosystem components often occur in more than one nation and are consequently subject to conflicting management and land-use practices. This research integrates the legal, institutional and environmental management components of transboundary biodiversity conservation to propose a comprehensive framework for evaluating the potential effectiveness of transboundary conservation regimes. The paper presents twelve criteria for the effective transboundary conservation of terrestrial biodiversity. These criteria can assist in the evaluation of existing initiatives and the design of future ones. The criteria will be of increasing importance as decision-makers seek to adapt to climate change and conserve biodiversity at all scales of political organization.

Keywords Effective governance · Transboundary biodiversity conservation · High Pamir and Pamir-Alai Mountains · *Heart of Borneo*

1 Introduction

International border areas contain some of the most biologically intact ecosystems in the world (Singh 1999; Westing 1998). At the same time, range shifts induced by global climatic change mean that more than half of the world's species are in need of transboundary management (Hannah 2010) and transboundary approaches are of increasing importance (Butchart et al. 2010; Wiens and Bachelet 2010; Reid and Swiderska 2008;

✉ Michelle Lim
  michelle.lim11@gmail.com

[1] Griffith Law School, Arts, Education and Law Group, Griffith University, Building (G36), Room 3.76, Gold Coast Campus, Parklands Drive, Southport, QLD 4222, Australia

Hannah 2010; Rands et al. 2010; Rüter et al. 2014). Many international boundaries have, however, been drawn for political rather than ecological reasons. Ecosystem components on each side of the boundary line are therefore often subject to conflicting management and land-use practices (Singh 1999).

The transboundary conservation literature highlights the benefits and challenges of transboundary collaboration. Most publications have a site-specific focus or discuss a particular management component of transboundary conservation (see, for example, Scovronick and Turpie 2009; López-Hoffman et al. 2010; Kim et al. 2011; Martin et al. 2011a, b). Other works analyse the legal issues of sovereignty, harmonization of national rules, types of legal arrangements and negotiating transboundary agreements (Shine 1997; van der Linde et al. 2001; Mohamed-Katerere 2001; Katerere et al. 2001; Rummel-Bulska 2008) or set out good-practice guidelines for transboundary protected areas (Sandwith et al. 2001; Erg et al. 2012). Though the literature provides useful insights into the challenges of transboundary biodiversity conservation and how these challenges might be addressed, there remains the need to synthesize the elements required to design effective legal governance regimes for transboundary biodiversity conservation.

Legal arrangements are frequently seen as pivotal to effective transboundary conservation. To be effective, laws for complex environmental issues such as transboundary biodiversity conservation require the consideration of other issues such as the capabilities of the government agencies concerned, the degree of receptivity of the community to the instrument and its implementation, and interactions between other various social, economic and institutional factors.

Despite this, there is no unified approach within law or other disciplines which encompasses all dimensions of the implementation of legal arrangements. As a result, I adopt in this paper a strategy of triangulation. Drawn from the social science methods literature (see, for example, Olsen 2004; Wolf 2010), this strategy uses comparisons to a range of 'reference points' and requires the mixture of methods including traditional legal methods and an engaged research component (Small and Uttal 2005). Two case studies, supported by extensive desk research, provide a real-world context within which to explore the issues of transboundary biodiversity conservation.

The first case study is the Sustainable Land Management in the High Pamir and Pamir-Alai Land Management (PALM) project. This is a joint project of the United Nations Environment Program (UNEP), the Global Environment Fund (GEF), the United Nations University (UNU) and the national governments of the former Soviet states of Tajikistan and the Kyrgyz Republic. The second case study involves the *Heart of Borneo* (HoB) project. The HoB project incorporates the three Bornean nations of Malaysia, Indonesia and Brunei. National legal teams were involved in the first case study. This facilitated an in-depth understanding of the legal and institutional frameworks and the governance context that these frameworks operate. Interviews and site visits were used within both case studies along with focus groups in the PALM case study.

The result of this research is a set of 12 criteria (see Table 1) to evaluate the potential effectiveness of transboundary conservation in terrestrial ecosystems. The criteria integrate legal, political, social, governance and environmental management knowledge. The case studies are used to test the findings of the desk-based research, inform the development of the criteria, and evaluate their applicability in practice. As part of the iterative process, the criteria are also used to evaluate the two case studies. This research therefore extends the good-practice guidelines contained within the literature and unifies transdisciplinary considerations for effective transboundary management. The triangulation approach provides a framework for determining what complementary reforms may be needed in

addition to suitable legal instruments. Effective transboundary conservation may be possible if a transboundary conservation initiative does not meet all of the twelve criteria. However, the fewer the criteria that are fulfilled, the more likely it is that an initiative will fail.

This paper builds on previous work (Lim 2013) which developed criteria for transboundary conservation with a particular focus on mountain areas in the face of climate change. This paper extends the cursory examination of the case studies in Lim (2013). An additional review of developments in the literature has resulted in a second iteration of the criteria which now includes a dispute resolution criterion (Criterion 12) and a set of criteria applicable to transboundary conservation more generally. I do not propose that these criteria are the ultimate or only tests for the potential of transboundary legal governance arrangements. Rather, they offer a grounded starting point for further development of methods and practices.

2 Twelve criteria for the effective transboundary conservation of terrestrial biodiversity

2.1 Threshold issue: net benefits of '*going transboundary*' considered

Transboundary collaboration introduces additional complexities and is a risky, costly and time-consuming process (Kark et al. 2015). Cooperating across borders also increases the network of stakeholders and can create new patterns of resource ownership and additional demands on national and sub-national institutions (Katerere et al. 2001; van der Linde et al. 2001; Petursson et al. 2014).

The coordination of conservation efforts can result in efficient and effective use of conservation resources, especially where neighbouring countries share ecological biomes, multiple species and conservation features (Kark et al. 2015). The existence of a shared

Table 1 Criteria for effective transboundary biodiversity conservation

Threshold issue: net benefits of 'going transboundary' considered
12 Criteria
1 Engages each level of political organization
2 Has political buy-in
3 Costs and benefits of transboundary conservation are equitably distributed
4 An integrated ecosystem approach which incorporates available science is applied
5 The objective of conservation is explicit
6 Good governance is practiced
7 Clear success indicators for ongoing monitoring and evaluation exist and adaptive management is practiced
8 Existence of rules and legal instruments that enable the process
9 Designated institutions are identified at each level of organization and vertical and horizontal linkages are established across all levels
10 Operates in consideration of capacity
11 Complexity is recognized and appropriate funding is secured
12 Dispute resolution mechanisms exist

resource or ecosystem is not in itself sufficient rationale for transboundary management. There has to be an apparent need for the countries involved to consider devolving power towards a transboundary regime as there are occasions where there is little net gain from collaboration (Petursson et al. 2014). Where conditions for in-country natural resource management are absent, these inadequacies can rarely be overcome by 'going transboundary'. The decision to engage in transboundary management should therefore be made following an assessment of the costs and benefits of doing so.

The differences between the PALM and HoB case studies illustrate the influence this threshold issue has on the level of commitment of parties to transboundary collaboration. Connectivity between designated areas of HoB countries is limited. The parties raise sovereignty concerns as a reason against engaging in extensive transboundary activities. The national governments of the HoB countries manage protected areas within their respective territories independently, and the transboundary component is limited in practice.

The interdependence of participating countries and their border communities is much greater in the PALM project. The challenges faced by the post-Soviet states of Kyrgyzstan and Tajikistan include the withdrawal of previously provided subsidies from the centralized Soviet government and the conversion of administrative boundaries to international boundaries within a short timeframe (Economic Commission for Europe 2009).

The emergence of the PALM countries as independent states has meant that many previously internal problems concerning the use, distribution and protection of natural resources have assumed a transboundary character. The Pamir and Alai mountain ranges have been traditionally used as an integrated geographic unit. The 270-km-long border separating Tajikistan and Kyrgyzstan constrains the movement of goods, services, livestock and people across the mountain ranges and the collection and exchange of information regarding migrating wildlife species (PALM 2010). The development of transboundary strategies to address the multiple livelihood, resource use and environmental protection issues is therefore an important issue for parties to the PALM project. As a result, there is genuine interest in cross-border collaboration and joint approaches.

2.2 Criterion 1: engages each level of political organization

Many border areas have a long history of transboundary cooperation at national, regional and local levels (Blake 1997). Transboundary biodiversity conservation involves multiple organizations and institutions from the local to the transboundary level. The transboundary context creates an additional layer of institutional complexity and a unique power structure. The principle of sovereignty means that transboundary-level authority is dependent on the endorsement of national-level powers. Though transboundary initiatives need not operate from every level of political organization, the involvement of each level is desirable.

Transboundary initiatives should identify the many levels of political organization that influence the transboundary management process as well as 'best fit' counterpart authorities across each level of political organization. Initiatives should actively involve stakeholders at every level and take into account the nature of power relations between stakeholders (van der Linde et al. 2001). Well-coordinated plans that consider risks at multiple scales while integrating stakeholders across scales provide an effective way of addressing the challenges of scale (Kark et al. 2015).

Transboundary projects, particularly the legal component of such projects, often prioritize agreements and collaboration at the transboundary level. Special attention must be

given to the sub-national and local level in the formalization of transboundary cooperation. This is because formal transboundary cooperation could constrain communities that have evolved organic forms of transboundary collaboration at the community level (Katerere et al. 2001) and risks counteracting local community conservation attempts (Petursson et al. 2014; Kark et al. 2015).

A top-down conservation approach which does not engage local communities can result in biodiversity losses in the event that governments are no longer able to enforce conservation regulations while provoking antagonism locally (Kark et al. 2015). At the same time, transboundary institutions are unlikely to have implementation or enforcement powers. Therefore, even if decision-making is situated at the transboundary level the involvement of the other levels is essential.

Proponents of decentralized approaches to conservation assert that local communities have more motivation than the state or distant corporate managers to conserve natural resources which are of direct economic benefit to them (Brosius et al. 2005). It is argued that denying resource use to local people severely reduces local incentive to engage in conservation. This threatens the long-term viability of such schemes as the monitoring and enforcement costs borne by governments are extremely high (Pimbert and Pretty 1997).

Grassroots liaison, at its best, builds familiarity and trust while supporting the development of flexible and innovative approaches (Shine et al. 2000). Andersson and Ostrom (2008) cite, however, local tyrannies as the most common source of failure in decentralized systems. Some self-organized resource governance systems will not be democratically constituted. Faure et al. (2010) point out that decentralization of environmental management in developing countries can lead to the capture of decision-making processes by local elites. These studies suggest that in some cases local end-users are better off where there is direct intervention from the central government to enforce the law against local elites.

Faure et al. (2010) point out that the location of decision-making is a key element in designing effective environmental legislation and argue that decision-making should occur at the level where standards are most likely to be set in the public interest. They argue, however, that centralizing decision-making competencies is advisable only if the central level can better guarantee that environmental issues will be resolved in the public interest or that the issue does not require considerable cooperation of local people.

Organic forms of transboundary collaboration exist in both the PALM and HoB initiatives. In both instances, local border communities are far from financial and political centres. The PALM project includes community participation components which aim to involve and empower the mountain communities in the PALM area. This goes a long way to address the fact that a large portion of decision-making occurs in the lowlands in the national capitals.

Transboundary community engagement is restricted in the HoB project. Vertical linkages from the transboundary to the local are also limited. The greater involvement of local communities would allow decision-making at national and transboundary levels to be better informed of local-level issues. The promotion of meaningful interaction between border communities would enhance understanding and cooperation between the countries involved in the initiative.

2.3 Criterion 2: has political buy-in

Developing and sustaining commitment for transboundary management at each level of political organization is one of the most important elements in determining the success of

initiatives. The existence of multiple stakeholders and competing interests among and between the different stakeholders makes this a challenging goal.

To develop support for transboundary initiatives, the creation of value and sense of ownership is essential. Biodiversity contains many values which range from the economic through to existence and spiritual values (Millennium Ecosystem Assessment 2005). Nevertheless, current measures of economic wealth do not reflect the total economic value of ecosystems (CBD Secretariat 2004). To gain political buy-in, the importance of the values of biodiversity and its conservation should be promoted. The importance of transboundary collaboration for protecting or enhancing that value also needs to be highlighted.

Global experience demonstrates that while more expensive initially, planning that involves all relevant actors from the initial planning stages instils a sense of ownership and commitment for the parties involved and is more likely to be successful in the long term (Cinner et al. 2005; Granek and Brown 2005; Simon and Schiemer 2015; van der Linde et al. 2001). Retaining the interest of stakeholders requires demonstrating how doing so will be in their interests. Socio-economic and political legacies of mistrust, however, create multiple challenges to implementing an acceptable regulatory regime (Simon and Schie-mer 2015).

Resource management across an international boundary impinges on sovereignty and potentially on national security. At the same time, unlike domestic law, international law mechanisms for ensuring compliance are weak (Kunich 2001–2002). Further, state consent is fundamental to binding a particular state to an international legal instrument (see Articles 26 and 34 of the Vienna Convention on the Law of Treaties 1969). The sincere support of states for transboundary initiatives is therefore critical. Unless the aspirations of the treaty are incorporated into national policies and decision-making, the act of signing a treaty will not translate into tangible environmental outcomes.

The PALM and HoB projects illustrate the challenges of project implementation when there is insufficient political buy-in and the complexities of developing political support. In both projects, greater political interest for transboundary biodiversity conservation could be developed by demonstrating the value of biodiversity and its conservation. The experience in the HoB in particular demonstrates that sustaining political support will require more than demonstrating the dollar value of conservation. As discussed in Criterion 6, where governments are not democratically constituted, support for the initiatives at each level can depend on the extent that decision-makers benefit personally. To be sustainable, it is important that decision-making is in the public interest. If there is a perception that benefits are not being distributed equitably, initiatives can suffer from the lack of political support (Katerere et al. 2001). This brings us to Criterion 3.

2.4 Criterion 3: the costs and benefits of transboundary conservation are equitably distributed

The direct and indirect causes of biodiversity declines are extremely complex and rarely if ever exclusively local (Mulder and Coppolillo 2005). The benefits of conservation projects based on global priorities are, however, reaped globally (Vermeulen 2004). In addition, conflicts can exist between the sovereign interests of nation states and the welfare of local communities who straddle these borders. Pooling common transboundary resources while privatizing associated benefits can therefore risk further isolating the poor (Sandwith and Besançon 2005).

The inequitable distribution of benefits between countries and shareholders has been identified as a major hindrance to transboundary initiatives (Singh 1999). Transboundary initiatives should therefore offer genuine opportunities for the equitable distribution of tangible benefits for stakeholders at all levels of political organization.

The lack of enthusiasm for transboundary conservation at the local level in the PALM and HoB projects could be attributed to concerns about the equitable distribution of the costs and benefits of transboundary conservation. In the PALM project, more needs to be done to ensure equitable distribution of benefits to the local level. Trophy-hunting and hunting-tourism often result in profits accumulated by a few with little if any gain for local communities (Lim 2013). The same can be said for the profits from logging in the HoB context. In the HoB project, concerns that participating countries may not benefit equally from transboundary collaboration appear to be a reason for hesitance in engaging in joint management.

2.5 Criterion 4: an integrated ecosystem approach which incorporates available science is applied

Transboundary management of biodiversity is often part of the ecological case for management at the scale of ecosystems. At the same time, the Third Global Biodiversity Outlook (GBO 3) has stressed that action to implement the *Convention on Biological Diversity* (*CBD*) has not occurred at a sufficient scale to address the pressures on biodiversity (CBD Secretariat 2010). Particularly with the advent of climate change, many protected areas are not, and will not be, large enough to preserve biodiversity in the long term, and species could become extinct even when they exist in protected areas (Reid and Swiderska 2008; Hannah 2010). Furthermore, state boundaries rarely take into consideration the parameters of ecological units. Transboundary cooperation is a valuable means of combining and coordinating biodiversity conservation efforts between countries to promote ecological integrity beyond the national level (Movchan 2004).

To implement the ecosystem approach across international boundaries, transboundary conservation needs to occur in the wider landscape beyond protected areas and take into account the various sectors that impact biodiversity. Policies in all sectors should consider the implications for biodiversity and integrate appropriate measures into management strategies (Thompson and Christopher 2008).

The use of appropriate and available science in the decision-making process is a common theme of successful conservation initiatives (Lundquist and Granek 2005), and the *Convention on Biological Diversity's* principles for the implementation of the ecosystem approach advocate the use of science to bring the approach into effect (CBD 2000). There are, however, significant challenges in translating scientific findings into policy and practice (Ryder et al. 2010).

Though ecosystem approaches are often used as the rationale for transboundary initiatives, such wisdom can often be lost in practice. The area of the HoB, for example, is presented as 'the last remaining place where the Indo-Malayan forests of Southeast Asia can be conserved on a scale large enough to be permanently viable' (Hardiono et al. 2005). The reality is that each of the participating jurisdictions determines unilaterally which parts of their territory are included as part of the HoB area. Many areas are protected areas which were gazetted prior to the introduction of the HoB. There is also limited connectivity between protected areas. The result is a group of unconnected protected areas under the HoB banner.

The PALM project acknowledges the importance of an ecosystem approach and includes components aimed to achieve sustainable land management. There is also a substantive land-use planning component and scientific studies which focus on areas such as biodiversity, pastures and livestock, cropland and water resources. Many of these studies are confined within national boundaries. More needs to be done to take into account the wider transboundary ecosystem.

The experience from the two case studies emphasizes the importance of science–policy linkages. Ecological data are collected in both projects. Further work is needed in both contexts to articulate how the data will inform decision-making.

2.6 Criterion 5: the objective of conservation is explicit

There is growing acknowledgement of the links between biodiversity and livelihoods; the contribution that biodiversity makes to human well-being (Millennium Ecosystem Assessment 2005); and the need to integrate human well-being and biodiversity conservation (Fisher and Christopher 2007; Sachs et al. 2009; Turner et al. 2012). Biodiversity–livelihood relationships are, however, nonlinear. Conservation and poverty alleviation objectives often conflict and are themselves highly complex. Though the importance of an integrated approach is highlighted in Criterion 4, the objective of conservation must not be overlooked in the incorporation of multiple values and sectors.

If the objective of conservation is not explicit, livelihood and development outcomes can be prioritized at the expense of environmental ones. By first clearly stating biodiversity conservation as a key objective of an initiative, it is more likely that governments and communities will remain attentive to the conservation aspect of the initiative.

The importance of Criterion 5 is particularly evident in the context of the PALM project. The PALM project aims to address a wide range of transboundary issues. The downside of this is that transboundary biodiversity conservation is overlooked. In contrast, the HoB identifies itself as a conservation initiative. The advantage of this is that while livelihood issues are acknowledged, the conservation objective is not forgotten.

2.7 Criterion 6: good governance is practiced

Good governance is essential for successful application of the ecosystem approach (CBD Secretariat 2004). Successful transboundary management requires good governance at all levels of political organization. Corruption and lack of transparency erode public support, impede effective resource mobilization and divert resources from poverty reduction and sustainable economic development activities. It is therefore important to establish transparency and accountability between levels of political organization from the local to the transboundary (van der Linde et al. 2001).

Transboundary projects can provide opportunities for corrupt powers to gain personally. Transboundary governance should therefore be examined in the wider political context as the various actors that have the power to propose and implement conservation policy change often and have multiple motives which do not necessarily prioritize the public good (Petursson et al. 2014). van der Linde et al. (2001) therefore suggest that improved national governance may be a precondition for the effective management of transboundary resources, and Katerere et al. (2001) recommend that the obligation to develop or improve such systems should be provided for in transboundary agreements.

It is of course desirable that good governance is practiced by in-country governments and the international institutions involved in the implementation of initiatives. Faure et al.

(2010) point, however, to the large amount of time and effort that international organizations have spent tackling corruption in the administrative structures of developing countries. These efforts have not resulted in noticeable improvements in corruption problems (Huther and Anwar 2001). Faure et al. (2010) indicate that the common approach to addressing corruption has been to increase the possibility of enforcing environmental law based on developed country models. The alternative they propose is to accept the existence of corruption and attempt to create a less corruptible legal regime. Ogus (2008), for example, recommends precise rules to reduce the potential for corrupt behaviour by bureaucrats as imprecise standard-based systems allow for discretionary decisions and hence opportunistic behaviour.

Inherent governance challenges are present in both case studies. Both the HoB and PALM initiatives demonstrate the detrimental effect governance challenges in one country can have on the whole transboundary initiative. The governance issues of in-country systems are major impediments to implementation. Lawlessness in Kalimantan combined with vested interests and the elite capture of funds generated from logging and land clearing for palm oil plantations on the Malaysian side severely strain the effectiveness of the HoB. Malaysia, for example, uses Indonesia's lack of capacity to address illegal logging to justify inaction within Malaysian territory (Lim 2014a).

In the PALM project area, there is an acute need for effective and equitable transboundary governance. Border communities are still dealing with the effects of the shift from porous borders of adjacent Soviet Republics to international boundaries following the fall of the Soviet Union. Transboundary activity remains, but is now restricted by border checks which are often subject to corrupt practices. Enhanced governance capacities and oversight are also needed to stem the transboundary wildlife trade.

2.8 Criterion 7: clear success indicators for ongoing monitoring and evaluation exist and adaptive management is practiced

Value-based standards are essential for the good governance of natural resources (Lockwood et al. 2009). Monitoring and evaluation based on specific indicators are effective tools for demonstrating progress and enlisting stakeholder support (Lundquist and Granek 2005) and are crucial to determining whether such standards have been met and where interventions are needed.

Managing any natural resource is ultimately about managing uncertainty (Ryder et al. 2010; Cullen 1990). Adaptive management is essential for transboundary biodiversity conservation due to the complexity of issues and scales that are involved. Monitoring and evaluation play a vital role in adaptive management. One of the benefits of policy evaluation is the learning which results from the assessment of past experiences (Pressman and Wildavsky 1984; Howlett and Ramesh 2003) as often the unintended impacts of cross-sectoral linkages only become apparent after implementation has occurred (Thompson and Christopher 2008).

Indicators should be developed with and by stakeholders at each political scale. This can enhance the perception of the legitimacy of the indicators. At the local level, site-specific biodiversity and livelihood indicators and targets should be developed with the communities where initiatives are based. Involving local communities in monitoring can create a sense of empowerment and pride while enabling communities to learn from mistakes (Roe et al. 2006).

The PALM and HoB projects both have some scientific data collection and project evaluation processes. The importance of data collection is also acknowledged in project

documents. Despite this, the lesson that emerges from both projects is the importance of science–policy linkages. The failure to sufficiently incorporate ecological data into decision-making is missed opportunities.

2.9 Criterion 8: legal instruments enable the process

Legal instruments articulate rules and create the framework within which stakeholders interact. Such instruments can provide the mechanisms through which regulatory and control measures are exercised. Legal instruments can have a further role as priority setting mechanisms and convey the message that decision-makers deem the issue in question to be an important one (Majchrzak 1984). The Brundtland Report emphasized that management based on equitable and enforceable rules and incentives is key to ensuring sustainable and equitable use of the global commons (WCED 1987). Effective transboundary biodiversity conservation requires more than the mere existence of transboundary agreements and corresponding national rules. Time and resources should be allocated to the careful drafting and development of legal instruments at each level of the transboundary process.

As indicated in Criterion 6, the development of precise rules within legal instruments can reduce the corruptibility of regimes. In the transboundary context, the development of binding instruments with precise obligations is notoriously difficult in the initial stages of cooperation. It may therefore be easier to amend existing national legislation so that it contains precise standards or to develop subsidiary legislation. Given the fixed nature of international instruments, locating overly prescriptive obligations in the transboundary instrument is not advisable. A combination of strategies is required, which aim to build governance capacity through auditing and oversight while developing precise standards and monitoring and evaluation within legal instruments.

Sandwith et al. (2001) indicate that formal and informal transboundary agreements are important means to declare common interests, agree on objectives, state guiding principles, and determine and ensure levels of commitment from parties. They also indicate that transboundary agreements secure the endorsement of relevant authorities and establish accountability. Similarly, van der Linde et al. (2001) indicate that agreements facilitate the clear identification of the parties and their roles and responsibilities and ensure that issues of sovereignty are not compromised.

The need for enabling instruments is not limited to the transboundary level. Transboundary cooperation can be hampered by different and/or conflicting laws, and lack of parity in the ratification of international protocols. In most cases, it will be necessary to amend each state party's rules to incorporate principles contained within transboundary agreements and to harmonize area-based rules (Shine 1997).

In both the PALM and HoB projects, the signing of non-binding transboundary agreements[1] was deemed by country parties and project implementers to be successes in themselves. The conclusion of an agreement should, however, be seen as a starting point. The content of the agreement, its appropriateness for the given situation, and the existence of clear rules and standards are the real indicators of the potential usefulness of such instruments.

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[1] The *Memorandum of Understanding about the joint implementation of the Strategy and Action Plan on Sustainable Land Management in the High Pamir and Pamir-Alai Mountains* ('the PALM MoU') concluded February 2011 and the *Declaration on the Heart of Borneo Initiative*, 12 February 2007, Brunei Darussalam—Republic of Indonesia—Malaysia.

The evaluation of existing environmental legislation and transboundary agreements proved an important exercise in the PALM project. Joint National Legal Task Forces (LTFs) from Tajikistan and the Kyrgyz Republic found, for example, conflict across primary legislation and inconsistencies within by-laws. If recommendations for the amendment of national legislation are implemented, this will not only facilitate the realization of project goals but also enhance in- country regulation of natural resources (Lim 2012).

In the HoB project, the lack of concern for the development of effective legal instruments and reluctance to harmonize in-country legislation means that the initiative is without a key tool for facilitating and guiding the implementation of the HoB project (Lim 2014a).

2.10 Criterion 9: designated institutions are identified at each level of organization and vertical and horizontal linkages are established across all levels

COP 7 of the *CBD* endorsed the design of management processes and institutions to match the scales of the ecosystem being managed (CBD, COP 7). From a scientific perspective, the management of an ecosystem unit by different institutions in accordance with different legal rules is unsatisfactory (Shine 1997). This can lead to duplication of effort, conflicting management policies, wasted socio-economic opportunities and weak or non-existent law enforcement. Regardless of the instruments chosen to regulate the environment, all require efficient institutional backing and adequate implementation resources. The optimum result arises when instruments work in concert and are supported by credible institutions with appropriate resources (Martin et al. 2007). If environmental regulation is to succeed, it needs to recognize that the effectiveness of rules depends not on their codification into formal law but on the knowledge of these rules and an acceptance of the values underpinning them by the actors who must operate within them and those who enforce them (Faure et al. 2010).

An increasingly globalized world requires institutions that link the local level to higher levels of social and political organization. It is therefore important to develop institutional systems that link transboundary planning to planning at national and local levels (Katerere et al. 2001). This can provide ways to deal with multiple objectives (Hackel 1999) and multiple knowledge systems (Millennium Ecosystem Assessment 2005).

Shine (1997) suggests that it would be preferable for the whole of a transboundary area to be administered as a single ecosystem unit by the one institutional body. The establishment of a single authority may be perceived by parties to be politically unacceptable particularly in the early stages of transboundary cooperation. Shine (1997) therefore recommends working with existing agencies to establish regular coordination between the lead agency in each participating country and that it may be necessary to develop a specific financial mechanism.

Others argue that transboundary initiatives which build on existing internal natural resource management and work through existing organizations are more likely to be successful (van der Linde 2001; Petursson et al. 2014). van der Linde et al. (2001) maintain that the creation of new organizations is undesirable as such organizations may not have buy-in or acceptability by other stakeholders. They also stress that good national-level natural resource management including appropriate structures and systems should be a basis for transboundary collaboration (van der Linde et al. 2001). They do not indicate, however, how to proceed when national systems are inadequate.

Petursson et al. (2014) recommend formalizing cooperation with corresponding conservation authorities in neighbouring countries instead of developing a whole new institution. Similarly, the experience from Tanzanian Village Land Forest Reserves reveals that the strengthening of existing institutions ultimately avoids the difficult, time-consuming and risk-laden process of creating new institutions (Nelson 2007).

Nevertheless, the success or failure of transboundary initiatives does not hinge on the existence of an overarching transboundary institution. What matters is that corresponding government bodies are identified within participating countries and responsible institutions are allocated at each level of authority. In line with Criterion 1, institutions should be linked horizontally at each level across the international boundary as well as vertically across each scale of organization from the local to the transboundary. Working within existing institutions may be more politically acceptable, but there are valid arguments for and against the establishment of new institutions. It is important to weigh up the pros and cons based on the circumstances in each case. If decision-making will be impartial and there exists the capacity for the enduring support of a transboundary institution, a new transboundary institution has the potential to be effective and efficient. This transboundary institution could act to distance transboundary conservation from national politics and break away from entrenched governance practices that may not be in the public interest. For this to succeed in practice there would need to be high levels of trust between country parties and significant long-term financial mechanisms.

Participating countries in the PALM and HoB projects have indicated a preference for working within existing institutional structures. Considering the capacities of the countries involved and the lack of funding for maintaining a transboundary institution in the long term, this is probably for the best. In the HoB project, an overarching institution is currently politically unacceptable. Without secure funding mechanisms, a transboundary institution in the PALM project is similarly not advisable at the present time.

2.11 Criterion 10: operates in consideration of capacity

This criterion stresses the importance of evaluating existing capacity from the outset then designing transboundary initiatives and reforming legal instruments and institutions in consideration of existing capacity. Implementation strategies should also be structured to match available resources at each level of authority.

In countries where administrative structures suffer from limited governance capacities, it is misguided to develop an environmental legal system that depends on strong administrative legal systems. Where it is possible to determine in advance that a participating country or countries lack the capacity or will to issue executive orders, Faure (2008) recommends structuring environmental legislation so that it is as independent as possible from such orders. Institutional and instrumental design should be based upon an assessment of the level of institutional development as well as an examination of the particular environmental problems faced.

Transboundary initiatives create additional demands on the administration of natural resources, policy development and harmonization, consultation processes, and implementation. A new set of expertise capable of operating in a complex and multi-layered policy environment may be needed (Katerere et al. 2001).

Enhanced capacity within weaker country parties may also be needed to facilitate equitable participation in meetings among nations (van der Linde et al. 2001). Local-level capacity building is also important. While local information may be extensively developed and used by communities, local groups are likely to have limited access to scientific know-

how (Andersson and Ostrom 2008). Many community-based institutions suffer a lack of skills, while insufficient funding can make community-based institutions dependent on donors (Barrow et al. 2000). It is therefore important to develop the capacity of governments to provide support for local-level initiatives (Prior and Holt 2006). The *Landcare* experience demonstrated that where the capacity of local institutions and organizations is high, organizations seek to form constructive, productive partnerships to support activities and implement sustainable natural resource management (Prior 2004). The reverse is also true. Prior and Holt (2006) stress that without the support of government and other relevant bodies, initiatives will at best function in a disconnected vacuum and at worst develop destructive practices that limit programme success.

Capacity issues are particularly evident within the administrative systems of PALM project countries. To develop instrumental and institutional capacity to the level required to implement biodiversity conservation based on northern models would require a complete overhaul of country systems and would take generations to complete. The short-term capacity-building strategies built into the project have improved the ability of country representatives to complete certain project components. To have an enduring impact, long-term capacity building is needed. Considering limited existing capacity, a rule-based system with fewer and simpler rules should form the main approach of PALM countries as this will likely be easier to administer (Ogus 2008; Schäfer 2006; Faure et al. 2010).

The HoB project highlights the difficulties that can arise where there are disparate capacities among participating countries. The different levels of development between the participating countries appear to have led to hesitancy in the creation of a transboundary institution and applying for international funding. The two wealthier countries (Brunei and Malaysia) are concerned that the least developed country (Indonesia) would be allocated the bulk of funds from international funding agencies that allocate funding based on gross domestic product.

2.12 Criterion 11: complexity recognized and appropriate resources secured

Many transboundary initiatives are aimed at the management of multiple and complex resources (Katerere et al. 2001). The sustainability of funding is therefore crucial to achieving transboundary conservation goals. Often transboundary initiatives are project (not programme)-based and work within 3- to 5-year time frames. Such time frames are rarely of sufficient length to achieve the intended outcomes of complex transboundary initiatives. van der Linde et al. (2001) emphasize the importance of securing flexible and multiple source funding bases, demonstrating clear links between benefits and costs at the local level, and ensuring the equitable sharing of benefits on both sides of the border.

The incorporation of 'transboundary thinking' into normal management operations and the opportunistic use of existing funds can go a long way towards funding sustainability. The transboundary context can also provide opportunities for securing funding through the establishment of cooperative budgets, joint revenue generating and fund-raising activities and joint project proposals (van der Linde et al. 2001).

Often insufficient resources are allocated for developing, adapting and maintaining the legal and institutional components of transboundary initiatives. Laws and institutions are fundamental to the effective function of transboundary initiatives. Ongoing and long-term financial commitment to facilitate the evolution and maintenance of these components is essential. In both the PALM and HoB projects, the importance of this is not recognized. At a more general level, both initiatives would benefit from longer-term funding mechanisms.

This highlights the importance of aligning and integrating project goals where possible with existing national strategies and priorities.

2.13 Criterion 12: dispute resolution mechanisms exist

Dispute resolution is important at all political levels from the international to the local. Dispute resolution mechanisms need to be specific and have the necessary political commitment and financial support to ensure their implementation and enforcement.

The potential for disputes at various levels of both initiatives is high. Despite this, dispute resolution mechanisms are not clearly set out in either of the case studies.

3 Conclusion

Transboundary natural resource governance for conservation purposes has the potential to deliver numerous benefits. To achieve this, a complex set of conditions must be fulfilled. Without acknowledgement of, and planning for, the immensity of the multifaceted nature of transboundary conservation, such initiatives are at risk of failure.

The criteria presented in this paper are intended to contribute to the evaluation of existing initiatives and to the design of the legal and institutional components of future initiatives. The criteria should help inform the implementation of the ecosystem approach across international boundaries. The criteria may also be applicable to evaluating the conservation of biodiversity across administrative boundaries within a country, within transboundary aquatic ecosystems and in areas beyond national jurisdiction such as the high seas. I have also demonstrated elsewhere (Lim 2014b) the capacity to adapt the criteria for the management of other transboundary resources such as international watercourses.

Compliance with ethical standards

Conflict of interest   The author declares that she has no conflict of interest.

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