Social context and the role of collaborative policy-making for private land conservation

Benjamin Cooke[a]*, William T Langford[a], Ascelin Gordon[a] and Sarah Bekessy[a]

[a]*Department of Global Studies, Social Science and Planning, RMIT University, Melbourne, Australia*

*Corresponding Author: Email: ben.cooke@rmit.edu.au

Abstract

Recent decades have seen a proliferation of conservation programs designed to encourage private landholders to protect and enhance biodiversity on their land. This paper reviews research that emphasises the role of social context in shaping private land conservation (PLC) outcomes. We examine the potential for a collaborative policy-making process incorporating design and implementation of PLC programs, to reduce conflict between conservation agencies and landholders and increase community consensus around PLC issues. Collaborative partnerships nested at the sub-watershed governance level may represent an appropriate geographic scale for engaging community interest, whilst linking PLC efforts to higher-level institutional frameworks.

Keywords: Private land conservation; social dimensions; collaboration; market-based instruments

Introduction

The protected area system alone is not sufficient for the conservation of biological diversity at a global scale (Gallo et al. 2009). Threatened ecosystems can be over-represented on private property, as geographic locations traditionally suited to settlement and agriculture often correlate with specific ecological niches (Platt and Ahern 1995). In the US alone, around 40 per cent of threatened or endangered species are found exclusively on private land (Defenders of Wildlife 2009). In recent decades, government and non-government organisations have sought to encourage private land conservation (PLC) through specific initiatives designed to preserve and enhance biodiversity. These programs have utilised a variety of policy mechanisms, including legally binding agreements (easements/covenants), market-based instruments (MBIs), suasion measures (information, training and extension services), or a combination of the above.

Despite the key role played by landholders in determining the success of such programs, through their decision to adopt and implement these initiatives, their influence has received less attention than ecological objectives when developing programs (Brechin et al. 2002). PLC programs have traditionally taken a homogenous view of landholder values, motivation and capacity (Vanclay 2004), potentially compromising adoption, cost efficiency and effective targeting of conservation need.

This paper seeks to emphasis that ignoring the social dimension inherent in PLC, runs the risk of not reflecting or engaging with the motives or management priorities of the intended adopters. We begin by briefly outlining the policy frameworks underlying efforts to conserve biodiversity on private land. Three themes will then be reviewed in order to demonstrate the importance of treating conservation as a fundamentally social process: the relationship between landholders and conservation agencies in dictating outcomes; the interplay of existing social dynamics like trust, legitimacy, intrinsic motivations and norms with policy instruments; and a specific discussion on the implications of social complexity for PLC, utilising emerging multifunctional rural landscapes as an example.

The final section reviews the potential for a collaborative policy-making approach for PLC program design for embedding ecological objectives within their relevant social context. We suggest collaboration has the potential to address agency-landholder conflicts, build consensus regarding PLC issues amongst the community and provide more equitable and ultimately successful conservation outcomes (Petheram and Campbell 2010; Cocklin et al. 2007). By emphasising the multiple phases of collaboration, from consensus building through to implementation (Lauber et al. 2008; Wondolleck and Yaffee 2000), an approach to policy development for PLC programs is outlined. This discussion will also address the need to consider how collaborative partnerships for PLC policy-making could be 'nested' within existing institutional frameworks, to mediate local community interests with higher level governance structures (Marshall 2008; Ostrom 1990). The sub-region (sub-watershed) is identified as a potentially suitable geographic scale for effective collaboration that balances local and regional priorities (Genskow 2009; Marshall 2008).

Policy settings for private land conservation

Regulatory "command-and-control" approaches have traditionally been preferred by Western governments especially to protect PLC values (Cocklin et al. 2007, p387). Private landholders have often viewed regulatory interventions concerning environmental policy as onerous and undermining private property rights (Doremus 2003). The implementation of laws like the Endangered Species Act (ESA) in the US, has drawn criticism regarding inflexibility, inefficiency (Whitten et al. 2003) and poorly resourced enforcement (Nie 2008). In some cases, this has resulted in landholders who fear the impact of restrictions on land use productivity, clearing vegetation to avoid threatened species being detected by authorities (Polasky et al. 1997). Brook et al (2003) noted that actions motivated by perverse incentives had the potential to undermine any benefit derived from the listing of a threatened species under the ESA. Despite these concerns, the history of policy interventions aimed at conserving biodiversity on private land is relatively short. Not surprisingly, a number of studies have identified that landholders generally consider voluntary measures much more palatable

as a policy approach to biodiversity conservation, especially when land has a productive value (Fischer and Bliss 2009; Cocklin et al. 2007; Doremus 2003).

However, voluntary conservation measures have their own shortcomings. Limited control over the spatial arrangement of implementation, a lack of quality control and doubts over long-term benefits are common criticisms (Monkkonen et al. 2009). There are a number of different forms of voluntary 'grassroots' or community-based natural resource management (CBNRM). The formation of local landholder collectives to help address sustainable land management objectives, such as Landcare in Australia, is a frequently cited example (Prager and Vanclay 2010). While such initiatives seek to empower local communities, concerns exist regarding continuity in the instance of key individuals leaving, or hard working members suffering burn-out (Lockie 2001; Curtis et al. 1999). These concerns have been paralleled with concerns regarding the transparency of public funding and support for such groups (Weber 2000).

The preference among landholders for voluntary conservation measures, in contrast to the preference for regulation by conservation agencies (Fischer and Bliss 2009), is important in charting the evolution of PLC programs. The perceived failure of regulation to elicit land management change (Langpap 2006) and the decreasing role of the state in environmental management (Marshall 2008) have spawned a multitude of voluntary and market-based initiatives (Stoneham et al. 2000). The shift in policy direction towards financial incentives is also a response to calls for addressing PLC equity issues, by reducing the cost burden carried by landholders for the provision of public good conservation benefits, in the form of ecosystem services (Stoneham et al. 2000). Such incentives may ultimately prove attractive to both landholders and conservation agencies, given the potential for balancing the surety aspired to by regulatory frameworks, with the flexibility of non-binding programs (Whitten et al. 2003).

Yet, the very recent emergence of MBIs means that no clear picture of their effectiveness has emerged to date (Barde and Smith 1997). While the popularity of MBIs is likely to continue gaining momentum amongst policy-makers (Whitten et al. 2003), MBIs in isolation are unlikely to

address the underlying causes of environmental degradation (Gustafsson 1998). There is also a concern that financial incentives could become a new norm, engendering a culture of expectation amongst landholders towards subsidy payments for even basic land management tasks (Fairfax et al. 2005).

Conservation agency-landholder relationship: the potential for conflicting perspectives

The traditional formula for PLC programs sees the conservation goals determined by conservation agencies, with landholders playing the role of program adopter (Siikamäki and Layton 2007). This approach reflects typical top-down governance arrangements, with policy objectives dictated by a central decision-making authority. As such, potential exists for a disconnect between conservation agencies and landholders regarding local conservation priorities and appropriate management responses. Speaking directly to this disconnect concerning the implementation of the ESA, Peterson and Horton (1995, p141) note "landholders perceive themselves as political outsiders (because) the rhetoric … has assumed an elitist form that fails to ground itself in local cultural practice".

Enticing landholders to enrol in a program is clearly vital for the implementation of any PLC scheme. However, landholder participation can be compromised when landholders and conservation agencies do not share similar preferences for the types of policy mechanisms to be used for achieving conservation goals. Given some programs require both the landholder and conservation agency to commit to a legally binding contract, the terms of the program need to be appealing to both parties (Mayer and Tikka 2006). For example, programs with compliance conditions or incentives considered overly restrictive or meagre, respectively, are unlikely to be widely adopted by landholders (Connor et al. 2008; Noah and Zang 2001).

Table 1 offers a hypothetical demonstration of how landholders and conservation agencies can possess differing perspectives on the desirable attributes of a conservation program. This is not intended to suggest, for example, that all landholders possess homogenous views on whether conservation programs should be legally binding. However, comparing the preferences of agencies and landholders towards specific policy attributes, as they appear in the empirical studies citied

demonstrates the potential for conflict. Conservation objectives could be jeopardised if these value positions are not recognised and made explicit when the development of a PLC program is being considered.

Table 1. The potential for differing preferences between conservation agencies and landholders regarding the characteristics of PLC programs.

Policy component	**Conservation agency preference**	**Landholder preference**
Agreement strength	Legally binding agreements within strong policy framework (Noah and Zhang 2001)	Non-binding with assurance that participation will not attract increased regulatory intervention (Langpap 2006)
Eligibility	Targeted at regions with high biodiversity values (Stoneham et al. 2003; Tikka and Kauppi 2003)	Broad eligibility criteria with simple and flexible objectives that facilitate wide spread adoption (Cocklin et al. 2007)
Monitoring	Clearly defined monitoring and reporting protocol for participants (Shogren et al. 2003)	Minimal agency interference – self-reporting and respect for landholder privacy (Reeson, 2008; Shogren et al. 2003)
Compensation	Compensation for participation that reflects a cost effective investment of public funds (Stoneham et al. 2003)	'Equitable' compensation reflecting the protection of public good conservation values (Langpap 2006)
Land use	Encourage change in land management practices in favour of biodiversity enhancement (Shogren et al. 2003)	Minimal imposition on productive land use and existing practices (Klapproth and Johnson 2001)
Policy continuity	Politically acceptable duration, cognisant of funding cycles (Raymond and Olive 2008)	Confidence in long term duration of program (Cocklin et al. 2007)
Administration	Streamlined, cost-effective administrative process (Shogren et al. 2003)	Transparent, fair administrative process (Chomitz et al. 2006)

The social dimension of private land conservation programs

The participation of landholders in PLC programs can be shaped by numerous social factors, many of which are inter-related. This section condenses a number of key implications for PLC from the literature regarding the role of trust, legitimacy, norms, intrinsic stewardship motivations and land tenure. This discussion centres on the implications for conservation policy when such issues are ignored, and potential avenues for incorporating social dimensions into program design and implementation.

Trust in conservation agencies

The trust that a landholder possesses in a conservation agency can play a pivotal role in their decision to participate or not participate in a PLC program. Mistrust of government interventions is frequently demonstrated in landholder-conservation agency relationships, to the detriment of conservation goals (Leahy and Anderson 2008). This is partly the result of a tendency for conservation policy to clash with entrenched landholder perspectives on the rights afforded to them by property ownership (Jansujwicz and Calhoun 2010; Farrier 1995). Furthermore, if any previous conservation initiative in the region has been poorly received, a perception of agency incompetence amongst landholders can emerge (Leahy and Anderson 2008).

Fostering a trusting agency-landholder relationship can have positive implications for the adoption of PLC programs. Some conservation agencies have used intermediaries like a trusted community representative (forester or local farmer, for example) to discuss projects with landholders at the outset, increasing the likelihood of developing a positive relationship (Wilcove and Lee 2004). The first point of contact with landholders may be a vital phase in dictating success; once programs are established, suspicions of ulterior motives on the part of the agency often fade (Wilcove and Lee 2004).

Procedural and substantive legitimacy

The legitimacy of a PLC program from a landholder perspective can take two forms; the procedure that was followed in the process of developing the policy, and the substance of the policy and its outcomes (Trachtenberg and Focht 2005). Landholder participation in policy making has the potential to increase the procedural legitimacy of a policy intervention in the eyes of private landholders (Breetz et al. 2005). While not all landholders in a region may have an interest in participating directly in policy-making, the knowledge that an equitable procedure was undertaken to incorporate input from non-government actors, may prove sufficient (Tyler 2000). Processes for pursuing procedural legitimacy will be elaborated upon in final section of this review.

Given perceived policy legitimacy is often highest amongst individuals who agree with the substance of a policy intervention (May 2005), it is important for landholders to relate to the problem being targeted. This can be challenging when landholders in a given regional will frame conservation issues in a number of different ways. As Fischer and Bliss (2009) found, property owners' perspective on threatened species management was framed around attitudes to private property rights and obligations, beliefs about human-nature relationships (including the right to exploit natural resources) and the merits of policy interventions for enacting social change.

Intrinsic motivations and "crowding out"

When implementing PLC programs, an understanding of the existing motivations for involvement in conservation practice can prove invaluable. For example, programs that offer extrinsic financial incentives to complete conservation works already being undertaken voluntarily on private land, can result in the "crowding out" of voluntary landholder motivations (Reeson 2008, p8). Frey and Jegen (2001) demonstrated that intrinsic motivations for conducting a given activity, such as conservation work, can be undermined by the introduction of external (financial) reward. The contribution of voluntary conservation initiatives on private land – through programs like Landcare in Australia – is such that only a small reduction in intrinsically motivated contribution could offset any gains from MBIs (Reeson and Tisdell 2007). Moreover, once intrinsic motivations have been discouraged, the resulting landholder disillusionment with the process, or with the agency involved, appears difficult to reverse (Hatfield-Dodds and Proctor 2008). Disillusioned landholders may also be less inclined to participate in future PLC programs.

Simply replacing voluntary motives with extrinsic incentives does not represent efficient or effective policy, and potentially proves counter-productive to conservation goals (Hatfield-Dodds and Proctor 2008; Frey 2001). By recognising existing intrinsic motives, PLC programs can be designed to build on existing voluntary efforts, rather than discouraging them (Reeson and Tisdell 2007).

Local normative influences

The influence of neighbours in shaping the behaviour of landholders provides a number of potential implications for PLC programs. Indeed, Riley (2006, p345) found the influence of neighbours in agri-environment schemes had three distinct phases: "information", where program details are discussed between neighbours primarily before program were adopted; "uptake", as landholders were at least partly influenced by observing the practices of others already involved in a program; "conformity", where neighbours reminded one another of obligations, to ensure they meet program guidelines.

Neighbourhood norms have been well established in the context of household recycling behaviour, where a "change champion" householder can induce a sense of obligation amongst neighbours to follow suit (Reid et al. 2009, p14). Engaging particular landholders in PLC programs based on the strength of their local community influence, may increase awareness of conservation issues and increase program adoption in a given region. For example, recruiting landholders to participate in PLC programs that are known amongst the community to be sceptical of government intervention could increase the likelihood that neighbouring landholders might also be encouraged to get involved (Wilcove and Lee 2004).

Land tenure and ownership arrangements

The suitability of certain policy instruments for PLC like conservation easements or MBIs can be complicated by differing land tenure and ownership arrangements (Clements et al. 2010). For example, whether private land may be owned outright (freehold) or leased (leasehold), adds complexity to a landholders' decision to adopt a program. Farming leaseholders may be focused on maximising short-term economic yield, due to the short duration of some lease arrangements (Riley 2006). Uncertainty around future leasehold occupancy arrangements has inhibited the adoption of PLC programs in the savannah grazing regions of Queensland, Australia (Greiner and Gregg 2011). Offering extended lease periods to potential leaseholders willing to participate in conservation

initiatives, as is the case with the Delbessie Agreement in Queensland (Department of Environmental Resources and Management 2011), may help to decrease such reluctance.

Indigenous ownership arrangements in places like Australia and Canada also add emphasis to the role of social dimensions in PLC programs (Duff et al. 2009; Berkes et al. 2007). Encapsulating indigenous local knowledge and customary practices by giving communities power in policy-making processes has yielded some success (Bishop et al. 2009; Berkes et al. 2007). Managing landscapes that cross indigenous and non-indigenous land tenure may also present challenges; prescribed burning regimes for cultural or ecological reasons on indigenous land may not align with economic motives for asset protection on adjoining property (Duff et al. 2008). Collaborative fire management projects in Australia's northern tropical savannah region have helped to minimise such conflicts, by bringing interested stakeholders together to plan prescribed fires (Duff et al. 2008).

Social complexity and PLC in multifunctional landscapes

Multifunctional rural landscapes provide a unique case for considering the implications of social complexity for PLC program design. Many post-productivist nations are experiencing increasing in-migration from amenity or lifestyle orientated landholders in rural landscapes once dominated by productive farming (Gosnell and Abrams 2009). While recent in-migrants might pursue hobby farming on a small or subsistence scale, many are drawn to rural regions for visual amenity and other lifestyle related motives (Argent et al. 2007). The resultant mix of amenity motives for property ownership and persisting agricultural production, present a dynamic context for conservation agencies looking to implement PLC policy.

As Gosnell and Abrams (2009) identify, recent in-migrants may not immediately possess knowledge of the practicalities of rural land management, while bringing a more idealistic notion of how the rural landscape should be conserved. Some may bring stronger views on the need for biodiversity conservation than previously existed in the community, instigating resentment between new and established residents (Pannell and Wilkinson 2009). It has been suggested that promoting

greater cooperation and knowledge exchange between long time residents and amenity in-migrants, may require specific incentives for cross-boundary collective action (Yung and Belsky 2007).

One issue constraining conservation action in multifunctional landscapes is the time it may take for recent in-migrants to develop social bonds with others in the local community (Salamon 2003). This may make it more difficult to disseminate information to the local landholding community via social networks. Such difficulties can be exacerbated by absentee landholders who only visit their property on an intermittent basis (Mendham and Curtis 2010; Pasquini et al. 2010). The extent to which lifestyle property owners interact and cooperate with their neighbours may present challenges to program implementation (Yung and Belsky 2007).

Contrary to popular assumptions, recent arrivals may possess very individualistic interpretations of private property rights, declining approaches from long-term residents to consider the need for cross-boundary management of particular threats (Yung and Belsky 2007). The desire for space and serenity that motivated the move to a rural setting may well result in a desire for "getting on with (conservation work)" in the confines of their own property, rather than contributing to local collective efforts over which they have less control (Gill et al. 2010, p323). Interestingly, this property-focused mentality may also correlate with increased willingness to enter into legally binding conservation programs like easements, especially for landholders seeking a rural lifestyle property for retirement (Pasquini et al. 2010; Ernst and Wallace 2008). Restrictions on productive land use could be less significant is such circumstances. Navigating a desire on behalf of some residents for conservation action at the property scale, with a desire to address landscape scale conservation goals, presents clear challenges to conservation agencies. Yet, it is only through a process of uncovering and investigating this diversity of stakeholder perspectives that this complexity can be properly incorporated in policy-making for PLC (Brook et al. 2003).

Collaborative policy-making processes for PLC programs

In recent decades, Western democracies in particular have moved towards a more inclusive process of policy making in the environmental policy sector (Wondolleck and Yafee (2000). This has

coincided with the diminishing role of the state, as natural resource management (NRM) responsibility has increasingly devolved to local and regional government (Marshall, 2004). As a result, a range of interested or effected community, business and government stakeholders have participated in land use, habitat protection and watershed planning processes (Koontz 2005). In this review, we use the term, 'collaboration' to describe a participatory decision-making process that allows citizens, government representatives and other key stakeholders to come together to solve complex problems (Weber 2003). Face-to-face deliberation through a committee or working group is usually the forum by which participants pursue a mutually acceptable consensus for responding to a given issue (Wondolleck and Yaffee 2000).

Collaboration offers a number of key potential avenues for addressing private land conservation challenges. Firstly, as Lubell (2004, p342) suggests, landholders are "grassroots stakeholders", meaning they are direct consumers of the natural resource that policy-makers seek to protect. In the case of PLC, they are also the owners of that resource. If PLC policy is to be effective, it will require action on the part of these grassroots stakeholders to achieve the desired outcome. Given the extensive control landholders exert over biodiversity on private land, excluding their input from the policy-making process increases uncertainty around the success of the intervention.

Secondly, traditional regulatory models for governing biodiversity conservation on private land have produced some conflict between governments and proponents of strong private property rights (Shogren et al. 2003; Peterson and Horton 1995). As discussed earlier, these conflicts can result in a lack of trust in conservation agencies on the part of landholders, limiting the uptake of PLC programs. Table 1 identified some points of conflict that could potentially emerge between conservation agencies and landholders, through differing preference about the attributes of programs. One of the strengths of bringing stakeholders with disparate views together is the potentially for participants to engage with each other's differences, and pursue goals that are mutually beneficial (Weber 2003; Wondolleck and Yaffee 2000; Margerum 1999).

Thirdly, the challenge with PLC is the need for enough individual landholders to participate in a program, or adopt pro-conservation behaviours, to result in a biodiversity gain at the ecosystem scale. No single point source can be regulated to achieve these gains, as conservation need is diffused across multiple point sources in the form of multiple private properties (Jansujwicz and Calhoun, 2010). Building community consensus around the problem of declining biodiversity, and an acceptable approach to addressing it, may help to increase program adoption across the private property landscape (Sabatier et al. 2005). Avenues for building community consensus through collaboration are discussed in the following section.

It should be recognised that collaborative projects often have multiple phases (Figure 1); a starting point could involve broadly engaging interested citizens through participatory forums and public meetings or submissions (Lauber et al. 2008). Evidence from collaborative partnerships for watershed governance suggests citizens who participate are often already active in other similar groups or initiatives (Koehler and Koontz, 2008). Inviting initial input from the wider public may result in enhanced representation from less established voices in the community. Recent amenity migrants to rural regions may be one such group who could benefit in this case.

Moreover, the selection of the collaborative committee needs to be deemed legitimate, or the outcome of deliberations may be challenged by the community (Margerum, 2007). Participatory forums may prove an opportunity for citizens to express an interest in being involved. An open access approach, where those who wish to participate are given the opportunity, may prove the most beneficial for perceived procedural legitimacy (Margerum 2007; Warner 2007). Ultimately, if the collaborative process is deemed ineffective, some landholders may actively undermine the policies that result (Lubell, 2004).

Building community consensus through collaboration

While a collaborative working group or committee provides a setting for social learning as participants engage with the perspectives of others, there is no guarantee that the wider community will be accepting of a committee's findings, as they have not been exposed to the same learning

process (Lubell, 2004). The translation of committee consensus to community consensus requires an upfront investment is building social capital around PLC issues (Koehler and Koontz 2008; Lauber et al. 2008; Sabatier et al. 2005; Putnam 2000).

One mechanism for building consensus may be identifying individuals with strong community links for participation in a collaborative committee. Leveraging the existing social networks of those involved in the collaborative partnership means the outcomes of social learning processes can flow back to grassroots stakeholders from trusted sources (Lauber et al. 2008; Lubell 2004). Disseminating information through Landcare and other grassroots CBNRM groups is another method by which existing landholder networks could contribute to building consensus (Sobels and Curtis 2001; Weber 2000).

A shared belief amongst the community around the problem being targeted, and the possible solutions, is likely to improve the manner in which PLC programs are received (Sabatier et al. 2005; Pretty and Smith 2004). As Peterson and Horton (1995) noted with efforts to protect the endangered Golden-cheeked warbler on private land in Texas, US, landholder objections to the project were not surprising, given they were only engaged at the implementation phase. Early, widespread public engagement mechanisms may be especially critical for increasing the level of trust between landholders and conservation agencies (Memon et al. 2010; Armitage et al. 2009).

Collaboration for policy implementation

Issue-specific collaborative partnerships like those focusing on PLC do not often persist beyond the point that a policy is introduced (Jansujwicz and Calhoun, 2010). Yet, continuing a collaborative partnership through the implementation of a PLC program may prove an effective way of tracking ecological, social and economic outcomes, and feeding that information back to grassroots stakeholders (Lubell 2004). Trust between landholders and agencies is difficult to build and easily eroded (Armitage et al. 2009). Maintaining community support, dealing with unforeseen implementation challenges and facilitating the monitoring and evaluation of the program could prove valuable roles for a collaborative partnership (Weber, 2003). Figure 1 offers an outline of

how the PLC policy-making could be organised to reflect the multi-phase collaborative processes discussed.

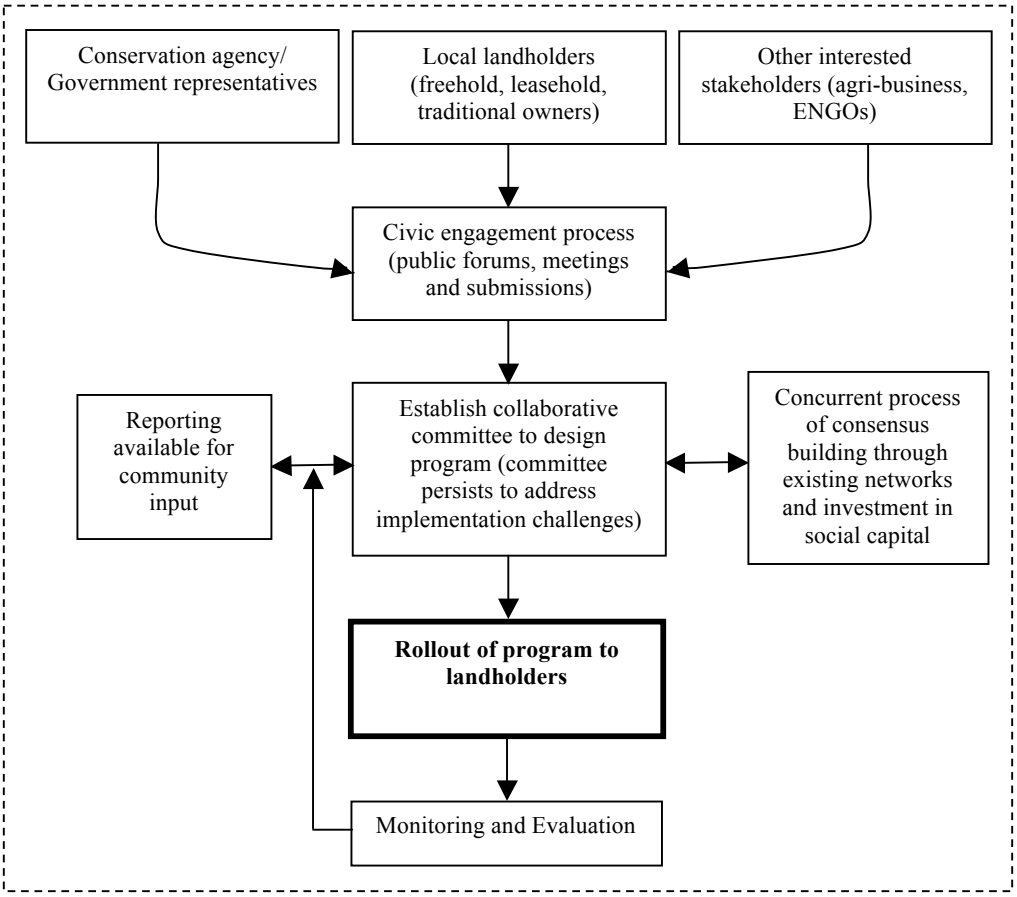

Figure 1. A collaborative policy-making process for PLC programs encompassing a consensus building and implementation phase for dealing with emergent challenges and evaluation.

Capturing local priorities: nested sub-watershed collaboration

A complex problem like PLC requires a collective response from grassroots stakeholders, resolution of potential conflict and strong social capital, all within the context of complex institutional frameworks (Brunkhurst et al. 2006; Ostrom 1990). As Ostrom (1990) demonstrated in common pool resource contexts, nested approaches that link local and regulatory interests across multiple scales are a characteristic of enduring governance arrangements in complex scenarios.

One of the key environmental governance challenges in Australia has been translating local enthusiasm underpinning CBNRM through groups like Landcare, to the scale of recently

established regional NRM authorities (Marshall 2008). While a key premise of establishing regional NRM was their capacity for achieving ecosystem-scale outcomes (Keogh et al. 2006), the level of community concern for dealing with environment management issues is often grounded at the local level (Lokocz et al. 2011; Cheng and Daniels 2005). What is considered local will vary between individuals, but is generally reflective of the geographical area that provides a sense of place for a community, and where residents interact with one another (Brunckhurst et al. 2006). For this reason, regional collaborative partnerships for PLC may struggle to be reflective of grassroots stakeholder concerns (Ferreyra et al. 2008), whilst not providing participants with a collective sense of place for helping to uniting potentially disparate views (Weber 2009; Cheng and Mattor 2006).

Sub-regional or sub-watershed bodies that link a number of local groups together have shown promise for integrating the interests and priorities of grassroots stakeholders with strategic regional governance priorities (Genskow 2009; Marshall 2008; Keogh et al. 2006; Sobels and Curtis 2001). The establishment of Landcare Networks in Australia has seen smaller, autonomous Landcare groups come together to coordinate land management outcomes at a sub-watershed scale (Sobels and Curtis 2001; Curtis et al. 1999). Given the large geographic expanse of some NRM regions, and the diverse array of management challenges that can present across a region, sub-watershed groups often represent a vital intermediary for information exchange and negotiation between local and regional bodies (Prager 2010; Farrally 2009).

Multi-tenure reserve networks (MTRNs) in Australia have also grappled with similar governance challenges. The objective of this integrated approach to biodiversity conservation has been to encourage communication and cooperation between private landholders, public land managers and other interest groups, for management at an ecosystem scale (Fitzsimons and Wescott 2008). One of the challenges associated with MTRNs has been the willingness of participants to commit to the process, as the ecosystem-wide scope does not necessarily parallel with the level of social concern (Fitzsimons and Wescott 2007). It is perhaps no coincidence that some MTRNs in

Australia underwent changes to governance structures, resulting in greater community control of management direction and priorities (Pfueller 2008; Fitzsimons and Wescott 2007).

In terms of linkages to higher governance levels, nesting collaborative partnerships at the sub-watershed level gives participants knowledge of institutional frameworks that might provide opportunities or constraints to local conservation efforts (Marshall 2008; Ostrom 1999). Furthermore, involving policy-makers (regional, state or federal) means social-ecological changes at larger scales, such as climate change or ecosystem-scale challenges, can be factored into collaborative decision-making (Memon et al. 2010). The NRM governance examples discussed suggest that collaborative partnerships for PLC programs located at the sub-watershed scale may be the most effective for mediating community interest and existing governance frameworks.

Challenges for collaboration

Collaborative environmental governance does not represent a panacea (Armitage et al. 2009; Ostrom 2007). It is likely to require upfront costs, be time consuming and test the patience of all involved (Innes 2004). Community consensus will also not emerge overnight – fostering long lasting consensus is a medium to long term commitment for all involved (Armitage et al. 2009). Difficult decisions regarding the inclusion or exclusion of potential actors on collaborative committees may be also required (Leach 2006). While an independent mediator may help placate some of these concerns (Leach 2004), these challenges can be imposing for conservation agencies, as public participation in policy development is rarely smooth and often robust (Smith 2008; Fischer 2005). Some conditions will prove more amenable to collaboration than others, however, we believe the challenges for PLC presented in this review make it an important tool for addressing some of the challenges of PLC.

Conclusion

Conservation is a human process, requiring a sufficient degree of social organisation and commitment from individuals and communities to achieve biodiversity conservation (Brechin et al.

2002). Ignoring this reality can result in PLC policy that neglects the social dimension governing implementation outcomes (Brechin et al. 2002). In this review, we have presented a number of cases exemplifying the social complexity embedded in PLC issues, suggesting a collaborative approach to policy making holds promise for addressing these challenges. Multi-phase collaborative partnerships that are nested at the sub-watershed level, invest in community consensus building and persist through the program implementation phase, appear suited to private land contexts. While collaboration takes considerable effort, excluding landholders from participating in PLC program design is likely to increases the risk of implementation failure, ultimately jeopardising conservation goals. As Peterson and Horton (1995) note, the process of managing publicly owned goods (biodiversity) on privately owned land necessities the collective efforts of both conservation agencies and private landholders to achieve positive outcomes.

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