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SUMMARY

Conservation covenants (or easements) are flexible but legally enforceable documents attached to a land title restricting the use of that land, providing for the protection of important conservation values, while allowing the landholder to retain possession. Given the attractiveness of covenants to those who seek to expand national and regional nature conservation initiatives, it is important to understand landholder motivations for participation in programmes that covenant for nature conservation. This paper examines the likely influences on landholder decision making when it comes to conservation initiatives. A review of literature highlights key motivations and determinants, such as landholder demographics and the nature of the land tenure in question, their knowledge and awareness of the programme, financial circumstances, and perceptions of financial and other risks and benefits of the programme itself, including incentives and compensation. Underpinning, or mediating, the decision-making processes will be landholder philosophies and values, and five constructs are determined from the review, namely economic dependence on property, private property rights, confidence in perpetual covenant mechanisms, nature conservation equity and nature conservation ethic. Using these constructs, a series of explicit hypotheses is drawn, applicable to agencies dealing with conservation covenants and testable through an adaptive management approach. A conceptual model is presented to show hypothesized relationships between motivational factors and the five constructs that will lead to the uptake of covenants by landholders, providing direction for policy makers and managers of incentive programmes for nature conservation on private lands.

Keywords: covenants, easements, equity, nature conservation, private land, property rights

INTRODUCTION

Government or private agencies will not buy and maintain every area of land and/or water on private property that merits conservation. Disenchantment with overcommitted public

land-management and resource agencies and insensitivities of centralized regulatory authorities to local communities (Stephens 2001; Merenlender *et al.* 2004), have led to the emergence and rapid evolution of incentive-based voluntary conservation mechanisms for private-land resources. Conservation covenants in perpetuity (referred to as 'perpetual covenants'; 'easements' in the USA) are one such class of mechanisms.

Perpetual covenants are flexible but legally enforceable documents attached to the land title and tailored to individual properties, the needs of individual landholders and institutional requirements. They are voluntarily donated or sold by a landholder to a unit of government or a recognized non-profit conservation organization as a non-possessory interest of a holder in real property (Wright 1993). They restrict the use of the land by specifying the obligation and entitlements under which the land is to be managed (Jordan 1993; Binning & Young 1997). Perpetual covenants entail a long-term commitment on the part of the landholder and the private or public conservation agency to the protection of important values of the land while allowing the landholder to retain possession and controlled use of the land (Jordan 1993; Wright 1993). They are frequently included as part of a contractual package in formal (government-sponsored) voluntary incentive programmes for nature conservation on privately-owned land (Langholz & Lassoie 2001).

Given their attractiveness to those who seek to expand national and regional nature conservation initiatives (Stephens 2001), it is important to understand landholder motivations for participation in such programmes (Merenlender *et al.* 2004). This would place more emphasis than has otherwise been the case on farmer concerns, so that farmers' opinions can be considered more carefully in agricultural research and extension, particularly in relation to environmental management and sustainable agriculture (Vanclay & Lawrence 1994).

However, limited empirical research on the motivational and other influences on the uptake of restrictive agreements for nature conservation is available. In its absence, this review draws upon research, using a selection of literature from Australia, the USA and elsewhere, that examines influences on the uptake of land and soil conservation initiatives, agricultural technologies and schemes that set out to retain native vegetation on private land.

These initiatives and schemes are hypothesized to be directly relevant to motivational factors for covenanting, and the extensive literature on their uptake (adoption) confirms the function of a complex set of factors (Clearfield & Osgood 1986;

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Vanclay & Lawrence 1995). In general, landholders respond positively to nature conservation efforts as long as proposed conservation measures are not perceived as a threat to their livelihood in terms of social and economic welfare, long-term objectives for the land and possibly long-term tenure with a notion of retaining land in the family. Measures that are viewed to be economically unfavourable, alienating the land from its owner or decreasing its market value, might not be readily accepted. Vanclay and Lawrence (1994) identified eleven 'barriers to adoption' of commercial and environmental innovations, most of which can be hypothesized to have relevance to decisions on the uptake of perpetual covenants, including: the complexity of the management practice; incompatibility with farm and personal objectives; loss of flexibility through tight restrictions; implementation cost; uncertainty about benefits from the investment; conflicting information about benefits or consequences of adoption; negative perceptions of the environment; the absence of infrastructure that can support the implementation of the required actions; and the social infrastructure, meaning the influence of other farmers on individual farmer's decisions.

If landholders perceive that encumbrances on the land title and other restrictions on use of the land under conservation are not in their interest, they can be reluctant to take up nature conservation schemes (James 1997; Productivity Commission 2001). Conversely, farmers are motivated towards environmental protection and participation in the various environmental programmes when they have a stake in the outcomes of conservation (Klapproth & Johnson 2001). Government policies also have an important role to play in influencing farmers' receptivity to land conservation programmes (Hollick 1990), by legitimizing such programmes, or by authorizing the implementation of incentives and removing disincentives.

This paper examines behaviour of farmers and other landholders participating in environmentally-related land management practices. Since attitudes are likely to be better predictors of behaviour to which they are specifically related (Ajzen & Fishbein 1980; Vogel 1996), successful uptake of conservation practices is likely to be influenced more by farmers' attitudes and perceptions than by any other factor (Miranowski & Shortle 1986; Smathers 1982).

The frameworks landholders use to decide whether or not to participate in a covenanting programme will depend upon several determinant (independent) variables: (1) landholder demographics and the nature of the land tenure in question, (2) landholder knowledge and awareness of the programme, (3) financial circumstances of landholder, and (4) landholder perceptions of financial and other risks and benefits of the programme itself.

Underpinning many of these variables will be landholder philosophies and values, such as: (1) their appreciations of, and attitudes to, notions of equity, (2) their appreciations of, and attitudes to, notions of property rights, and (3) their conservation ethic.

This paper discusses these three classes of factors and their inter-relationships, and aims to produce a conceptual model that suggests intervention points for policy makers and delivers testable hypotheses for future research.

DETERMINANTS OF COVENANT UPTAKE BY LANDHOLDERS

Age, duration of land tenure and full-time or part-time farming

Landholder age has been found to be a factor determining uptake of low-input practices on farmlands. Older landholders have been characterized as being more resistant to uptake because they perceived covenants to be unfeasible or impractical, and were more sceptical about the benefits of uptake, since those benefits would not occur during their lifetime (Drost *et al.* 1996). Similarly, landholders with a long period of land ownership in the family are more likely to resist uptake of a perpetual covenant than landholders with a shorter period of family land ownership, because of their confidence in their ability and accumulated experience to deal with the conservation threats on the land without the use of a binding covenant mechanism.

Alternatively, older landholders, and those with a long period of land ownership in the family, may more readily adopt practices to protect land values like covenants if there are no heirs or if they perceive the next generation to be untrustworthy. Under these circumstances, we would expect positive correlations between the decision of primary producers to undertake environmental stewardship and their duration of tenure (see Haw *et al.* 2000).

Landholders' willingness to participate in conservation programmes can be characterized according to whether they were farming full-time or part-time and the size of their properties. Klapproth and Johnson's (2001) review of a study of Maryland's riparian landowners comparing the characteristics of those who had established forested riparian buffers through an incentive programme and those who had not, showed that part-time farmers were more likely to participate in programmes than full-time farmers because (1) their opportunity cost of taking land out of production was much lower than more active farmers, (2) they were less concerned about possible hidden costs of adopting the programme, and (3) they were more likely to be interested in on-site amenities generated by the conserved areas than full-time farmers (Hagan 1996, cited in Klapproth and Johnson 2001).

Knowledge and awareness of the programme, and its relevance to landholder goals

Landholders have unique ways of managing their properties and this can impede innovations or uptake of conservation technologies (Drost *et al.* 1996). They are also more likely to accept innovations or practices that they view to be profitable,

simple to implement and compatible with their goals and objectives for the land (Klapproth & Johnson 2001). Simply stated, landholders will only take up a conservation innovation when they understand it well, have confidence in it over other mechanisms, view it to be easy to implement and in accord with their goals and objectives for the land, and their reasoning is not unduly impeded by financial considerations.

Drawing upon further studies of issues surrounding the adoption of riparian forest buffers on private lands, Klapproth and Johnson (2001) differentiated between those landholders that possessed and those that lacked an interest in a conservation reserve programme. Those interested in the programme were primarily motivated by appreciation of nature, environmental conservation and economic arguments, while those that did not want to participate were more concerned with any potential economic loss they might incur from uptake of the programme, or wished to avoid the programme's rules and regulations.

The principal factors that influence the uptake of conservation innovations by landholders vary with the type of innovation. Guerin (1999), for example, pointed out that uptake of soil conservation practice is attributed to the intrinsic characteristics of the practice itself: its mode of operation as well as the principles on which it operates. The ease of application or uptake and versatility of conservation innovations or practices are important elements that influence their uptake (Drost *et al.* 1996). Inadequate knowledge about a prescribed innovation, particularly with respect to its benefits and the issues that it aims to address, can limit its uptake (Guerin 1999). Individuals must agree that the goals of the programme are worth pursuing and that their actions will advance the goal, non-compliance must be observable in order to create social pressure for compliance and the cost of the programme should not greatly exceed benefits derived by landholders (Harrington *et al.* 1985). In this sense, conservation practices that are little known are not likely to be easily adopted, giving policy makers clear direction to instigate promotional activities. In Ohio (USA), for example, availability of information that leads to increased awareness and knowledge was one of the most popularly cited requirements by farmers for successful uptake of a conservation practice (Batte *et al.* 1990). Langholz *et al.* (2000a), in their study of landowners participating and not participating in Costa Rica's Private Wildlife Refuge Programme, found a substantial information gap existed, which if breached would lead to easy and quick uptake.

However, uptake of a conservation innovation may not occur even when all is known about it. The relevance of an innovation in terms of its consistency with landholder needs and goals, socioeconomic status and attitudes towards different practices remain crucial to its uptake (Nowak 1987).

Economic factors and landholder finances

Buttel *et al.* (1990) present an overview of the changing research foci and theoretical approaches within rural

sociological research over the last century. Evidence suggests that the uptake of innovative environmental practices occurs for commercial reasons rather than environmental benefits, especially among commercially-oriented farmers as opposed to those 'farming as a way of life'. In terms of conservation easements, Parker (2004, p. 498) adds that their adoption will '... probably facilitate more economical production of non-conservation output.' The suggestion inherently categorizes farmers into two groups based on whether the source of their motivation in decision-making regarding the uptake of an innovation is economic or not.

Economists argue that individuals make rational decisions in choosing options that seem to them most likely to secure their largest net, or even most immediate, economic advantage. Most rural landholders live in an economic environment where they gain land or off-farm employment or economic benefits. Therefore any major decisions regarding their land might rightly be influenced by their economic implications (Vanclay & Lawrence 1995). This view is consistent with Dunlap and Van Liere's (1984) conclusion that concerns for the environment are a significant motivation for appropriate environmental behaviour only when basic economic and survival needs are met. Langholz *et al.* (2000b) concluded from their study of profitability as a motivation for nature reserve establishment and operation that profit was an extremely powerful motivating force for landowners, second only to a sense of stewardship or conservation ethic.

Farmers' choices might therefore be seen as being constrained within some multidimensional 'decision space' boundaries within which they operate, and a farmer's objectives and perceptions of his/her economic situation are decision determinants held within these boundaries (Hollick 1990).

Compensation decisions with respect to three case studies in Queensland (Australia) suggest that biodiversity may be threatened where there is a perception of an economic imbalance between the benefits associated with conservation effort and those from alternative land-uses (Tisdell & Harrison 1999). This suggestion is compounded where an economic loss from the uptake of a conservation programme is a possible risk. Some landholders are unwilling to incur costs in programmes that offer only long-term economic returns (Norris & Shabman 1988). The level of farm debt is another situational barrier that is likely to significantly influence the decisions of landholders to undertake conservation measures that require or trade-off financial input (Haw *et al.* 2000). The relative productivity of the land (measured in financial terms) also influences uptake of conservation practices or innovation (Sinden & King 1990), and a meta-analysis of 34 datasets carried out by Gartell and Gartell (1985) showed uptake was positively correlated with farm income. These issues suggest that institutions involved in landholder finances like banks (farm debt), governments (taxation, rates) and cooperatives (product pricing) can play a role in overcoming barriers (see discussion on incentives below).

Perceived risks and benefits

Uptake of a conservation innovation is more likely to meet with resistance where the perceived benefits and risks are not clear (Hollick 1990; Guerin 1999). Alternatively, farmers will adopt conservation technologies when they perceive land degradation to be an active hazard to their productivity or infrastructure (Rickson *et al.* 1987). Minimizing such financial risk is particularly important for encouraging uptake of sustainable farming practices (Drost *et al.* 1996) because, as Conacher (1998) noted, change in environmental behaviour becomes an issue if people feel 'threatened'. Therefore, landholder decisions regarding the uptake of a perpetual covenant can be influenced by their perception of risks and benefits to their short- and long-term farm objectives, often measurable in financial terms.

If farmers are more concerned with using the land to support themselves rather than maintaining the ecosystem (Alexander 1995), they will want to realise the direct and tangible benefits of the mechanism or programme in most instances (Norris & Shabman 1988). Local communities often appropriate little economic benefit from conservation programmes, which may be a disincentive to biodiversity conservation (Tisdell 1998). For example, Klapproth & Johnson (2001) demonstrated that landholders were willing to adopt a conservation programme if the proposed actions under the programme had direct benefits such as a permit to extract material, grazing rights and direct financial incentives. Other incentives might include tax-relief (Wright 1993). In the USA, the tax benefits to the landholder generated by the conservation covenant are determined by subtracting the value of the land after the covenant from the value of the land before the covenant was granted (Gustanski 2000; Parker 2004). This allows landholders to write-off the value of the development rights as a charitable donation, provided that appraisals of the value of the land are not inflated or otherwise unrealistic (see Anderson & Christensen 2005). The benefits of a programme or mechanism must therefore be clearly established, with regulatory oversight.

The span of time before benefits can be realised can also influence the uptake of a conservation innovation. Norris and Shabman (1988) suggested that even when economic reasons were the motivation for programme uptake, farmers were unwilling to incur costs in proposed programme activities or investments that offered only long-term economic returns. In addition, Langholz *et al.* (2000a) demonstrated that unintended incentives (beyond those offered formally as incentives to enter a conservation programme) proved to be key selling points for landowners in Costa Rica.

Risks and benefits are not always measured in exclusively financial terms, particularly where a close personal identification with, or attachment to, a place of environmental significance exists (particularly where such a place may connote a significant past event or experience; Rogan *et al.* 2005). Likely benefits to landholders through the use of perpetual covenants include an explicit recognition that existing recognized values of the property will continue to

be protected by their heirs (see Wright 1993), and this may be a strong motivating factor for landholders to participate in negotiations to prepare the necessary legal documentation. Depending on the jurisdiction, however, perpetual covenants can be modified or terminated with the agreement of both covenantee and covenantor or by a court of law, particularly when the conservation objectives of the covenant become impossible to achieve. This ability to challenge a perpetual covenant in a court of law, or to change it in the future, may cause them to be viewed by conservation-minded landholders as unreliable for assuring long-term nature conservation, and this may provide a reason for their reluctance to participate in a covenanting programme. Alternatively, it may suit landholders who are wary of the finality of legal documentation.

Risks such as potentially undesirable impacts of uptake of conservation practices can influence decisions. In the USA, for example, landholders expressed a fear that the retention of conservation areas under a programme would lead to undesirable consequences, such as the introduction of pests like deer and noxious weeds onto the farmland (Klapproth & Johnson 2001). Similar sentiments were expressed in Australia, with regard to the perceived spread of weedy plants and feral animals from programmes that sought to make connections between tracts of native vegetation on farmlands (Coates 1987; Jenkins 1998). In these cases, landholders may perceive risks where agricultural production is threatened, thereby impacting on farm incomes, or where threats to existing ecological or other non-economic values are conceivable.

LANDHOLDER PHILOSOPHIES AND VALUES

Equity

The major tenet of the equity theory, as part of the theory of motivation, is that human beings work to restore equity when they are confronted with inequitable situations (Harrington *et al.* 1985). Article 19.2 of the Convention on Biological Diversity assumes that there are benefits that flow from the use of biodiversity and that these ought to be shared between the custodians of biodiversity and the public (Glowka *et al.* 1994). Similarly, there is a view among a cross-section of landholders that the cost of nature conservation on private land should be shared equitably between landholders and the public, and that recognition should be made of the services provided by landholders to the broader community (see for example Australian and New Zealand Environment and Conservation Council 1997).

Common (1996) and Jodha and Russell (1997) observed that conservation initiatives may cause a disproportionate spread of costs and benefits over space and time, thus creating or accentuating perceived or real social and economic inequalities for different landholders in different ways. Concern has been noted by farmers in the USA that they might be forced to bear the cost or incur losses from conservation actions

that primarily benefit the public (Klapproth & Johnson 2001). Local communities have few incentives to conserve biodiversity if they perceive they do not equitably share its benefits (Tisdell 1998). Therefore, despite the increased recognition of the importance of encouraging conservation of nature on private land by governments and the public (Harrington *et al.* 1985), the issues as to who should pay, how individual needs and circumstances can be addressed and how goals and standards should be set to ensure flexibility and fairness to all, are rarely addressed.

In a detailed analysis of the principles, motivations, conflicts and constructions of justice, Montada (2003) identified the components of equity (in relation to equity theory of distributive justice) as the proportionality (and equality of ratios) of contributions and outcomes for similar actors. This theory may be particularly relevant in the apportionment of financial and other economic incentives among landholders for encouraging their participation in nature conservation activities. Intergenerational equity, viewed by Common (1996) in terms of the distribution of utility over time, in which a consumption foregone today makes available units of consumption at a future date, can fit the above definitions if consumption of natural resources equates to the opportunities and outcomes associated with their use.

These conceptualizations of equity are important both for moral reasons and the need to share benefits and costs as a means of encouraging conservation (Krattinger & Lesser 1995). This suggests that land placed under voluntary covenants should receive the appropriate recognition in kind to cover costs incurred in the arrangements, and in some cases opportunity costs foregone by the private landholder in conserving nature for the benefit of the community. However, the answer as to what is equitable is subjective, being linked to individual perceptions and values. A secure basis for determining equitability can therefore be difficult to achieve, requiring an understanding of all factors that different stakeholders use to determine equity on an individual basis, and then arriving at a consensus over what might be acceptable to most. One of the challenges in the use of management agreements is how to achieve a cost-effective incentive mechanism for motivating private landholders to participate in nature conservation where perceptions of (in)equity vary between individuals.

Compensation and resource substitution programmes (Spergel 1997) are a way of achieving equity, particularly where the service provided by the landholder can be classified as a community conservation service. There is, however, difficulty in establishing the point at which the landholder's duty of care ends and the community conservation service begins (Binning & Young 1997). This creates a challenge in determining fairness in compensation that addresses costs or losses incurred beyond the duty of care. Furthermore, because conservation values and expected actions under duty of care vary from one landholding to another, it is difficult to determine the different levels of recompense to award each landholder.

In addition, it is necessary to know the socioeconomic profile of the participants and their dependence on the resources that are placed under conservation (Jodha & Russell 1997). Equity should ensure there are plans to minimize the disruption of people's lives resulting from participation and loss of access to the resources. Equity promoting compensatory measures (Jodha & Russell 1997), often influenced by existing institutional arrangements and decision-making processes associated with the conservation initiative, should be employed.

In a comparison of aspects of voluntary and regulatory approaches to natural resource conservation, Brant (2000) asserted that many landholders wanted to adopt conservation practices/systems but were hampered by high social and/or economic costs, stressing the importance of adequate monetary compensation to ensure that social benefits outweighed social costs and that they coincided with landholders' short- and long-term plans. Safeguards to enhance equity in conservation programmes may involve a mix of measures dealing with compensation for sacrifices, providing a share in the gains in the short- and long-term, and incorporating the views of the affected people in the choice and design of conservation measures (Jodha & Russell 1997). In the USA, the federal government has provided cost share payment to farmers who implemented conservation practices on their property, a payment in principle of society's share of the cost of conservation for the benefit that it gains (Brant 2000).

Legislative and regulatory frameworks can be used effectively to prevent inequity by assigning costs and benefits of conservation. For example, frameworks might ensure that benefits are distributed in proportion to the costs incurred in managing the conservation site, and the purchase of labour and capital inputs (Borrini-Feyerabend 1997).

Property rights

Conservation covenants challenge traditional landholders' concepts of rights in relation to land ownership. Granting of a conservation covenant essentially creates a legal partition of the ownership bundle of property rights (Gustanski 2000). Rights typically removed from the land by a conservation easement (or restrictive covenant) include development and mining, and those rights that remain are non-destructive (Gustanski 2000) of environmental values jointly agreed to by the covenantor and covenantee. There is no universal definition of property rights (Meyer 2000). It constantly changes with time and in accordance to societal expectations and the context in which they are applied. However, property rights assign the authority for any non-prohibited use of specific goods (Eggertsson 1990) and the rights to claim that use or the benefits that flow from the goods (Macpherson 1978). A right bestows on an individual the ability to compel the State to defend their interest in a particular outcome (Sjaastad & Bromley 2000).

Property rights, therefore, ‘establish relationships among participants in any social and economic system and express the relative power of the rights bearer’ for a specific period (Meyer 2000, p. 1). The concept of property rights is broad, extending beyond the legal sphere to include social norms (Eggertsson 1990) that are ‘supported by the force of etiquette, social custom, ostracism and formal legally enacted laws supported by the States’ power of violence or punishment’ (Alchian 1977, pp.129–130). As society changes over time, notions of property can become controversial in terms of what it is and what it ought to be: ‘The perception and reality of it make property both a concept and an institution, both of which influence each other over time’ (Macpherson 1978, p. 1).

Despite the notion among many people that the land under their title can be used, enjoyed and treated as they wish, historical actions by governments and courts suggest that property rights of private landowners are shared with the public (Meyer 2000). All external interest in nature conservation on privately-owned land falls under the institution of ‘common property’ rather than ‘private property’ and users of ‘common property’ share rights to the resources and are subject to rules and restrictions that govern the use of those resources (Cullet 2001). Any dealing with a private landholding under common property therefore has to take into account the entitlements of others and is subject to approval by all those with a stake in it.

Property rights are therefore a bundle of rights, such as the right to sell, lease, donate, subdivide and grant a covenant, just as the public also has a bundle of rights, such as to tax, take for public use and regulate use (Farrier 1995). These rights can be added or subtracted, thus changing the amount of benefits streaming from the rights. Recent trends have led to the addition of air and water quality protection, and species conservation and preservation, to public rights. What are perceived to be the accorded rights with respect to land use may differ from one landholder to another and from one period to another. In many democracies, the bundle of rights to a suite of benefits from a given set of resources is controlled through private ownership, public open access, public closed access and state ownership (Meyer 2000).

Klapproth and Johnson (2001) note that landholders’ fear of possible future introduction of regulations by government to restrict their use of buffer zones is a deterrent to the decision to enter into an agreement for their reservation. Attenuation of property rights by the State and avoidance of responsibility for maintenance of the conservation zone were other reasons mentioned by landholders as factors deterring their entry into an agreement to reserve the buffer zones. The existence of concern about an increased burden of government regulations on property owners and the loss of control over the management of the property under a formal conservation arrangement for the public good, has been raised (i.e. United States Department of Agriculture 1999; Bates 2001). Formal recognition of these concerns, and taking steps to ameliorate them, involve duty of care and stewardship, incentives and compensation. Property rights have relevance

in social relationships beyond the more apparent relationship between people and property (Vira 1995). Their definition and allocation therefore require that they be considered in the broad social context in which they are to be applied (Cullet 2001).

Conservation ethic and stewardship

Many issues and decisions on nature conservation on private land cannot be addressed solely through technical expertise or science because they are linked to important values and ethics. In turn, these are linked to the social environment, to the economic environment, to perceptions and to knowledge of nature conservation (Bengston 1994). These linkages must be taken into account in setting up nature conservation mechanisms. Environmental ethics are generally broad and more abstract than values, as they apply to human-environment relationships. They deal more specifically with human conduct towards, or interaction with, the biophysical environment, the drivers and structure of this interaction and what constitutes the appropriate relationship (Manning *et al.* 1999).

Equity, duty of care and stewardship of natural resources and property are linked (Binning & Young 1997). Stewardship is the partnership between landholders and other bodies, formed to carry out set conservation objectives, where benefits of conservation extend beyond the landholder to the public. This involves actions by the landholder that include, but go beyond, the duty of care, the expected reasonable response by a landholder to prevent harm emanating from actions or inactions on the property and extending to others. The principle of prevention of harm implicitly refers to present and future generations, linking duty of care to the concept of intergenerational equity. Duty of care legislation could set standards that require individuals to act within their ‘reasonable and practical’ ability to prevent harm to the environment where risk occurs (Bates 2001). Stewardship extends this ‘command and control’ and compensation should be paid to landholders only for activities over and above the duty of care (Binning & Young 1997). Landholders may recognize a problem that requires conservation actions, but feel it is beyond their scope of effort to undertake it within a stewardship partnership. In such circumstances, Klapproth and Johnson (2001) pointed out that varying the level of technical assistance may be necessary according to individual needs. Assistance is also particularly important in the introduction of a conservation programme and when the expected conservation practices are complex and landholders are unfamiliar with them.

Linking duty of care with the concepts of intergenerational equity and sustainable development, where landholders can relate to them, may stimulate their interest to carry out actions that accept, but then go beyond, the duty of care. This notion is based on the premise that humans behave rationally to safeguard what they view to be in their interest, or even perhaps in the interest of the next generation.

DEVELOPING HYPOTHESES AND A MODEL

Drawing on the factors that influence landholders to adopt environmental innovations, technologies or conservation practices, this review has identified a multiplicity of factors that might influence landholders' decisions to place a perpetual covenant on their lands. Landholders may be more likely to be positively motivated towards the uptake of a perpetual covenant if they:

- farm part-time and/or farm as a way of life;
- are less economically dependent on their property;
- are younger and do not have a long period of land ownership in the family;
- are older, have a long period of land ownership in the family, and perceive that property values will not be cherished by subsequent generations;
- have a strong nature conservation ethic, demonstrated by, among other things, strong value and attachment to the natural environment;
- have a higher level of knowledge and awareness about covenanting as an option; and
- perceive that a covenant can legitimately avert long-term degradation and thereby minimize risks to their property or family from an environmental threat.

Similarly, greater effort may be needed to convince landholders to uptake a perpetual covenant on their land where they:

- perceive the possibility of financial obligation arising from entering a perpetual covenant on their land;
- perceive a loss in market value of their land because of placing a perpetual covenant on it;
- have a strong notion of property rights that is not diminished by notions of common property;
- dislike restrictions on land use (for a variety of reasons such as disliking change, or the imposition of restrictions from external regulatory sources, urban or otherwise);
- perceive the need for compensation where any act or process they might undertake is in the public good; and/or
- perceive that equity will not be achieved or not in a timely way, by compensation or incentive packages.

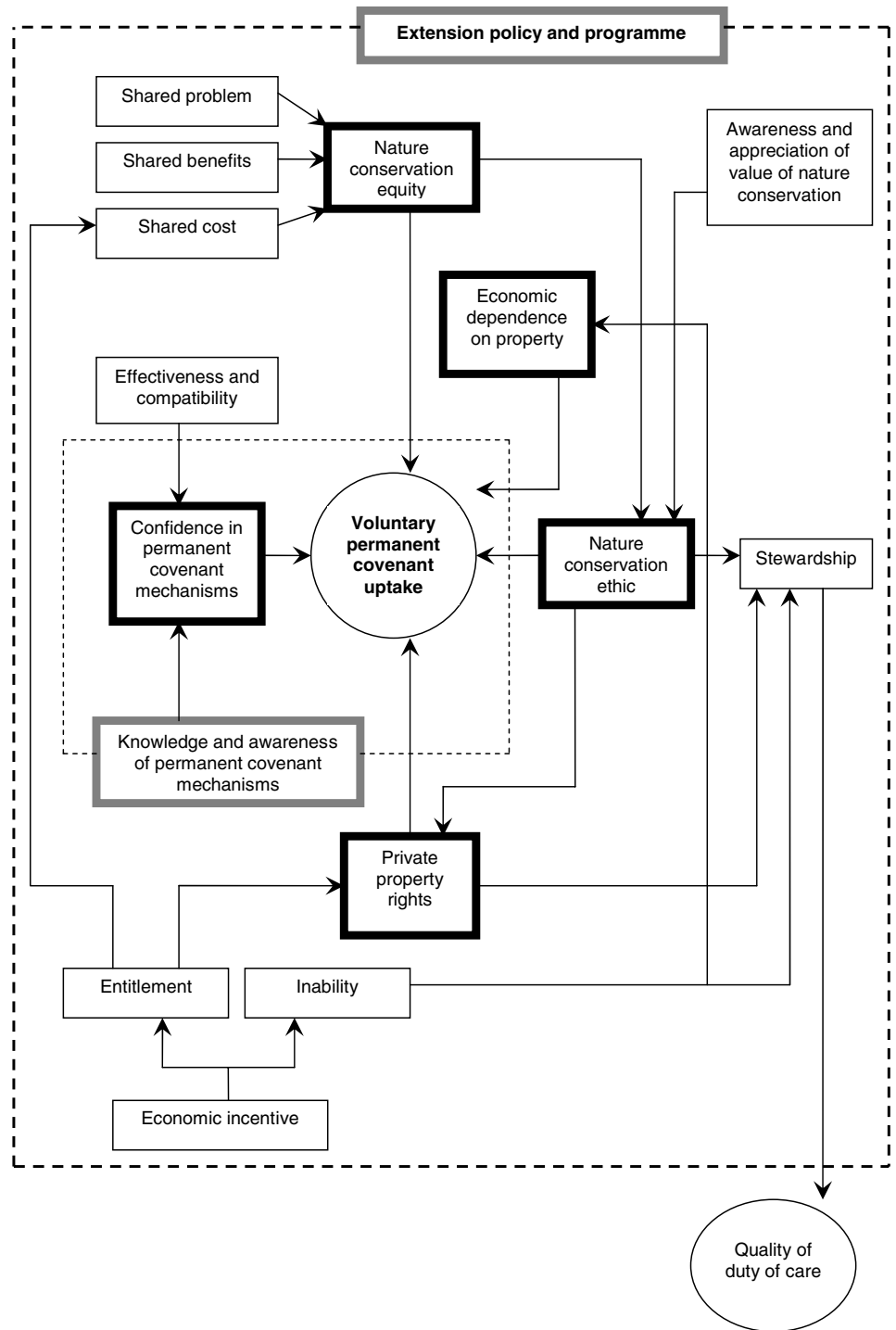
Each of the above statements serves as an hypothesis about those landholders likely to adopt conservation covenants. Together they suggest that landholders who fit a certain profile will be easily motivated towards the uptake of a covenant for nature conservation. The list may serve as a valuable adjunct to the barriers to uptake proposed by Vanclay and Lawrence (1994). The list also demonstrates the heterogeneous nature of landholder motivations to become involved in a conservation initiative like a covenanting programme, and that programmes that have a 'one-size-fits-all' approach will be too inflexible for a landscape of multiple landholders.

These hypotheses are supported by Parker's (2004) parallel work on the motivation and choices available to land

trusts when deciding whether to conserve donated land by owning it outright, or hold conservation easements and on-sell land to a new landholder. Land trusts, non-profit organizations that seek to preserve or enhance environmental amenities, are principally motivated by a nature conservation ethic, and beyond this economic considerations operate. Review of land trusts operating in the USA demonstrates that conservation easements generated higher transaction costs than if the land trust purchased and subsequently owned the land outright (Parker 2004). Even so, where production and nature conservation were jointly required on properties, the conservation easement option was more appropriate; a divided ownership arrangement can operate with the land trust/conservationist and a landholder/producer. The landholder can then concentrate on production of commodities, the land trust as purchaser of the covenant can provide an environmental service to its customers (land trust beneficiaries) (Parker 2004). This situation is relevant here in that the landholder's decision over whether to covenant land will be negotiated with a covenantor, an agency equipped to administer the contractual obligations of the covenant.

We propose a conceptual model (from Kabii 2004) of how the hypotheses suggested here might be inter-related. The voluntary uptake of covenants by landholders may be achieved through policy makers and decision makers in land trusts paying attention to the pathways indicated, mediated by these five constructs: economic dependence on property, private property rights, confidence in perpetual covenant mechanisms, nature conservation equity and nature conservation ethic (Fig. 1). The criteria for awarding economic incentives are based on 'entitlements' and 'inability' of landholders (Fig. 1). Economic incentives are awarded to landholders as entitlement on equity grounds to compensate for loss of private property rights, and as the public's contribution to cost sharing in nature conservation for actions beyond the duty of care. In this sense, we include in our definition of 'entitlement' the market-based amount for which the landholder is willing to settle. Economic incentives are also awarded based on landholders' inability to carry out stewardship actions (Fig. 1). This is particularly the case where there is evidence that a landholder is willing but unable to cover the cost of conservation under a perpetual covenant. Duty of care lies outside the model, but it is depicted in order to illustrate its relationship with the constructs and factors of the model. The quality of duty of care is influenced by quality of stewardship and the attitudes to private property rights of landholders. Confidence in permanent covenant mechanisms leading to an uptake is mediated by the degree to which landholders are informed (through knowledge and awareness) about the mechanisms, the effectiveness of the mechanism to achieve its specified goals and the compatibility of the mechanism with the landholder's own goals. Command and control regulation should operate to enforce the duty of care, while payments are made for stewardship and on equity grounds.

Figure 1 Conceptual model showing the necessary factors and policy tools in a coordinated framework for promoting landholders' uptake of perpetual covenants. The bold rectangular boxes in the model represent the five principal constructs in the uptake of a perpetual covenant. The lines with an arrowhead depict the model processes, with the arrow pointing to the output that results from a given intervention. The thin-bordered rectangles denote other interventions and factors that have an effect on the principal constructs, or model outcomes, apart from a perpetual covenant uptake, which are affected by one or more constructs. The areas enclosed by the dotted lines denote the area of influence of the policy intervention (within the grey-shaded rectangles). Extension policy and programmes are suggested in the model as the overall operative tools for facilitating the achievement of the uptake of perpetual covenant goals.



The goal of the conceptual model is to encourage the uptake of perpetual covenants by identifying likely barriers to their uptake, and offering approaches to their removal, while concurrently building a nature conservation ethic, sound understanding of long-term nature conservation mechanisms and providing management support.

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