Regulatory opportunities and constraints facing private sector biodiversity conservation outside protected areas

A South African perspective

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Signed:

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List of acronyms and abbreviations

The Biodiversity Act: The National Environmental Management: Biodiversity Act (10 of 2004)

The Biodiversity Convention: The Convention on Biological Diversity (1992)

BM agreements: Biodiversity management agreements

PBOs: Public benefit organisations

BMPs: Biodiversity management plans

BWI: Biodiversity and wine initiative

CARA: The Conservation of Agricultural Resources Act (43 of 1983)

CEMAs: Co-operative environmental management agreements

CMAs: Catchment management agencies

DOC: Duty of care

ECA: The Environmental Conservation Act (73 of 1989

EIA: Environmental impact assessment

The Electricity Act: The Electricity Act (41 of 1987)

The Estate Duty Act: The Estate Duty Act (45 of 1955)

FPAs: Fire protection associations

The Income Tax Act: The Income Tax Act (58 of 1962)

IUCN: The world conservation union

MLRA: The Marine Living Resources Act (18 of 1998)

MPRDA: The Mineral and Petroleum Resources and Development Act (28 of 2002)

NEMA: The National Environmental Management Act (107 of 1998)

The NEMA EIA regulations: The List of activities and competent authorities identified in terms of sections 24 and 24D of the National Environmental Management Act (107 of 1998)

NEM: AQA: The National Environmental Management: Air Quality Act (39 of 2004)

NVFFA: The National Veld and Forest Fire Act (101 of 1998)

NWA: The National Water Act (36 of 1998)

The Protected Areas Act: The National Environmental Management: Protected Areas Amendment Act (31 of 2004)

The Ramsar Convention: The Convention on Wetlands of International Importance Especially as Waterfowl Habitats (1971)

The Stockholm Convention: The Stockholm Convention on Persistent Organic Pollutants (2001)

The Transfer Duty Act: The Transfer Duty Act (40 of 1949)

The Water Act: The Water Act (54 of 1956)

WUAs: Water user associations

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Any governance system that is designed to regulate complex biological systems must have as much variety in the actions that it can take as there exists in the systems being regulated. This is a tall order, but it is one to which we need to pay serious attention. Unfortunately, much of contemporary policy analysis does not base recommendations on the law of requisite variety. (Ostrom 2001: 781)[1]

I INTRODUCTION

Biodiversity[2] comprises the variation of living species on earth upon which its human population depends for survival.[3] This is so because diversity maintains biospheric conditions without which human life, integrally tied up with all other forms of life on earth, would become extinct. Related to its life-sustaining properties, biodiversity's capacity sustains the provision of a valuable set of natural resources that includes water, food and medicinal materials. In addition biodiversity is accorded intrinsic value because a growing number of individuals believe that mankind has an ethical obligation to conserve every other form of life on earth. Humans are one of numerous species who occupy space on earth, together comprising an environment upon which the diversity and survival of all species are dependent. Viewed historically these are relatively new intellectual and belief systems.

It is argued that such global considerations are particularly pertinent in South Africa because of its status as the third biologically most diverse country in the world.[4] The World Heritage Site designation of the Cape Floral Kingdom in the Western Cape, for example, is based on the exceptionally high biological diversity of the area.[5] Also of

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[1] E Ostrom 'Institutional diversity of commons' (2001) Encyclopaedia of Biodiversity, Volume 1, S Levin editor, San Diego: Academic Press, 777-791.

[2] Although its definition remains unsettled in the judgment of certain researchers, probably a minority, biodiversity is commonly defined as comprising three interrelated levels of environmental phenomena. Moving from small to large scale, these are *genetic diversity, species diversity and ecosystem diversity*. The National Environmental Management: Biodiversity Act 10 of 2004 in South Africa and the Convention on Biological Diversity 31 International Legal Materials, for instance, adopt this position when they define the concept as 'the variability among living organisms from all sources including terrestrial, marine, and other aquatic ecosystems and other ecological complexes of which they are a part and also includes diversity within species, between species, and of ecosystems'.

[3] D Clark and D Downes 'What price biodiversity? Economics and biodiversity conservation in the United States' (1985) 11 *Journal of Environmental Law and Litigation* 9.

[4] World Conservation Monitoring Centre 'Global biodiversity status of the earths living resources'(1992).

[5] Of the 18 000 plant species occurring in South Africa, 80 percent occur nowhere else in the world (*White Paper on the Conservation and Use of South Africa's Biodiversity* (in GN 1095 GG 18163 of 28 July 1997) at 12).

particular importance to South Africa, given the sizeable proportion of its population that is poor by most criteria, is the recognition of biodiversity as a prerequisite to achieving sustainable development.[6]

But traditional approaches to biodiversity conservation have not achieved levels of protection for biodiversity in South Africa judged adequate in the research community. The current status of the country's biodiversity is considered one of the most threatened on the planet.[7] Commentators have identified a range of reasons for this.[8] Shortcomings in the current protected areas policy regime,[9] as well as provision for the listing of species under threat, [10] and limitations of the command and control regulatory system within which these approaches are couched, constrain the reach of such traditional approaches.

Within what can be termed the traditional approach, policy actions have been weighted towards the extension of protected areas. The precarious status of ecosystems and of particular species both inside and outside protected areas[11] has been attributed partially to a protected areas framework functioning ineffectively.[12] In consequence, the recent emphasis in policy shifts aimed at biodiversity conservation has been to right these deficiencies within protected areas designation and management practice.[13] Although species listings do form part of this entrenched approach, in order to keep the scale of this paper within reasonable bounds they are excluded from the discussion of policy background in **sections 2.1**, **2.2** and **2.3**.

What promotes inertia in retaining the traditional approach is the high proportion of private ownership[14] of the land upon which biological resources exist, because 88

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[6] D Farrier 'Conserving biodiversity on private land: incentives for management and compensation for lost expectations?' (1995) 19 *Harvard Environmental LR* 303 at 305; P Sands *Principles of International Environmental Law* 2 ed (2003) 499-501.

[7] R Wynberg ' A decade of biodiversity conservation and use in South Africa: tracking progress from Rio Earth Summit to the Johannesburg World Summit on Sustainable Development' (2002) 98 *South African Journal of Science*.

[8] These will be elaborated in following sections.

[9] Protected areas as the sole device for biodiversity conservation is proving too limited in scope. Therefore the need to protect biodiversity outside proclaimed protected areas can be argued as increasingly recognised in policy forums, in South Africa as elsewhere.

[10] Conservation efforts include a number of laws that list various species of fauna or flora in respect of which certain activities are regulated. For instance, the National Forest Act (84 of 1988) (Chap 3 Part 3) and Western Cape Nature Conservation Laws Amendment (Act 3 of 2000). Licenses are generally required for undertaking activities that may impact on listed species.

[11] According to the *National Spatial Biodiversity Assessment 2004: Priorities for biodiversity conservation in South Africa*, *Strelitzia* 17 South African National Biodiversity Institute, ix – xiiii, 34 per cent of terrestrial ecosystems, 82 per cent of signature rivers and 65 per cent of marine bio-zones are classified as threatened.

[12] See *Board of Investigation into the Institutional Arrangements for Nature Conservation in South Africa: Report* (*Kumleben Report*, 1998), 9-10.

[13] See the *White Paper on Biodiversity* and the *Kumleben Report, 1998 supra* (note 12).

[14] The private sector comprises owners as individual persons as well as companies or corporate entities that undertake for profit a range of activities. These comprise fishing, mining, mariculture and stock farming, with plantation forestry, agriculture and urban expansion being the most environmentally threatening pursuits. The benefits sought from the land to which private interests have access can often not be obtained in a manner that is sustainable, as we have come to learn in recent decades. In Section Two this is put down

percent[15] of all land in South Africa is privately owned.[16] Thus to extend conservation coverage it is necessary to co-opt private sector support for biodiversity conservation on a scale that appears unrealistic.

With the Government lacking financial resources to buy private land in significant quantities for conservation purposes, other policy instruments should be sought for ongoing conservation on land under private ownership.[17] In the current situation, where protected areas have too limited an impact on the problem, alternative instruments that function *outside* protected areas merit investigation.

Although command and control approaches have clear weaknesses this dissertation proposes that the wholesale adoption of an incentive-based approach to environmental regulation on its own is not alone the key. At base the success of environmental restoration depends on the existence of a well functioning regulatory framework. This would be more effective and far-reaching in function if it were to be expanded and diversified into a hybrid system; that is, one which includes both regulation and incentive-creation devices.

In **section two** the limitations of the existing approach to biodiversity conservation in South Africa are discussed. The drawbacks to relying predominantly on protected area mechanisms and a command and control regulatory system are assessed. Proposals are then made regarding the extension of current policy as a platform[18] to secure a greater rate and volume of biodiversity conservation. This section concludes by demonstrating the need for policies that sustain biodiversity not only inside protected areas but also outside them.

A range of environmental attributes are recognized as integral to a given region's biodiversity. Human-initiated activities impact adversely on these attributes.[19] Consequently the range of application within which remedial instruments need to operate is also wide. **Section three** examines legal mechanisms available to conserve biodiversity

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to private individuals acting in their own self interest, with the current regulatory approach lacking scope to turn their incentives and behaviour towards environmental protection.

[15] The Department of Land Affairs has released statistics stating the proportion of the surface area of South Africa owned by the state as twelve percent. See 'Box 5.3' at http://land.pwv.gov.za/White%20paper/white7.htm#Public%20land.

[16] Along with most countries we thus have a situation where private individuals own the bulk of the land in South Africa, with the remainder in the public domain, either state or collectively owned by communities.

[17] Although protected area mechanisms have played an integral role in restoring and enhancing biodiversity in many parts of the world, there are persuasive arguments that the unutilised scope for private action in conservation has the potential to be broader in application.

[18] It is important to note here that policy currently identifies certain factors essential to secure biodiversity conservation. Thus the focus is more on implementing and developing the insights that already exist rather than departing from them.

[19] This range of impacts is extensive and usually negative in effect. Biological variation is open to an extremely wide set of influences some of which result from human activities. Exploitation includes actions that take materials *directly* out of the environment, like natural resource use, while other actions affect biodiversity *indirectly* through industry, farming and habitat modification. The latter tend to change habitats in the longer term, sometimes only with a time lag, and thereby constrain biodiversity in a more indirect way.

under national and sectoral environmental legislation. It weighs up what is hypothetically available[20] against what is feasible to implement.[21] These mechanisms are analysed in terms of (1) why they are relevant, (2) their possible forms in implementation, (3) what regulatory opportunities exist for their use in South Africa, and (4) their likely weaknesses and the options available for their reform. Certain instances are discussed in greater detail where specific examples can *illustrate* the strengths and weaknesses of the mechanism in question.

Incentive devices are required to produce conservation awareness in private owners. This is not just for designating protected areas, but in order to foster biodiversity conservation on a wider front. In the overall design of environmental management regimes, regulation tends to follow command-and-control lines. Thus the likelihood is low of private landowners initiating responsibility for conserving the commonly owned[22] environmental attributes of their land in the absence of incentives provided for them to do so.

In **section four** possible incentive opportunities and constraints are discussed. At the outset key criteria are identified that broadly frame the analysis of the incentive forms considered. Within the spectrum of incentives discussed, however, specific attention is paid to *economic incentives.* This is because it is evident from the referenced literature that the bulk of international and domestic attention on policy in recent years has focused on this category.

The implementation of incentive-based approaches is in its infancy in South Africa. Putting into operation certain policy levers compatible with the legislation is wholly preliminary,[23] so practical drawbacks remain difficult to gauge. Thus potential hindrances to implementation in South Africa have to be derived from a set of theoretical considerations, which is a second best procedure but not avoidable.

Section five concludes by arguing that a particular combination of policy actions - that is, combining a specific regulatory mechanism with an appropriate incentive for private agents - may be better suited to the South African situation than are others.

2 LIMITATIONS OF THE TRADITIONAL APPROACH TO BIODIVERSITY CONSERVATION

2.1 Reliance on command and control

At the outset a broad distinction needs to be drawn between direct intervention, known as command-and-control mechanisms to regulate action, and incentive devices like

[20] This is synthesised from a survey of international literature.
[21] Based upon consideration of the current statutory framework and the mechanisms that exist therein.
[22] To clarify, all biological resources in a national jurisdiction are in the Public Trust and therefore need to be conserved in the public interest. So the government at any time regulates use and access to them, but this has to be done with the interests of the people in mind, present as well as future generations. Clearly these can entail multiple sources of potential conflict which are not pursued in this thesis.
[23] Certain problems of implementation are probably not yet foreseeable.

economic levers which encourage or discourage certain kinds of behaviour. Command and control systems by their nature are state-centred. In South Africa, as in most countries, this translates into construction of a legal basis for intervention.

Regulation prescribes a range of objectives and standards for enforcement by state agencies. In South Africa the avenues for enforcement are delimited by the range of possible administrative and criminal measures treated in recent literature.[24] In contrast, incentive-based instruments discussed in **section four** operate on the presupposition that in order to achieve environmental objectives it is usually more efficient and effective to reward positive behaviour than to sanction negative behaviour.[25]

Despite the problems in command-and-control mechanisms, being their tendency to inflexibility, high administrative costs, excessive imposition of regulatory responsibility, and reaction to rather than anticipation of problems, these measures have acquired historical dominance in the regulation of private behaviour for environmental goals.[26] But in recent decades increasing numbers of national administrations have realised the need for other approaches. [27]

One general contention by certain environmental researchers[28] is that the preferred strategy should be to identify first the *origin* of the particular environmental problem at hand and then to devise legislative instruments to mould behaviour towards addressing the problem. However, regulations are often formed in response to public health and safety concerns as they surface over a particular issue, and therefore tend to be piecemeal in their formulation and environmental impact.[29] In such cases, command and control

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[24] For discussion of these measures see M Kidd 'Alternatives to the criminal sanction in the enforcement of environmental law' (2002) 9 *South African Journal of Environmental Law and Policy* 21. These include fines, imprisonment, community service, rehabilitation orders, presumptions of responsibility, civil cost recovery, legal cost recovery; strict liability, employee liability, vicarious liability, director liability, and private prosecution. Examples of administrative measures would be directives; submission of environmental management plan requirements; environmental reporting obligations; and environmental impact assessment (EIA), amongst a range of others.

[25] The earliest justification of this approach was that by A Pigou in his book *The economics of welfare* (1920) Macmillan, London. He argued that providing incentives and information for individuals, organizations and industries to internalise the costs of their actions (social as well as environmental) was the solution to solving the market's failure to do so adequately. See also, R Stavins *Environmental Economics* (2007) National Bureau of Economic Research: Working Paper 13574 at 1; A Jaffe, R Newell and R Stavins 'A Tale of Two Market Failures: Technology and Environmental Policy' (2005) 54 *Ecological Economics* 164 at 165-166 and 171-174; and R Stauth and P Baskind 'Chapter 3: Resource Economics' in R Fuggle and A Rabie (eds) *Environmental Concerns in South Africa* (1992) at 27-52.

[26] Kidd 'Criminal sanctions' (*supra* note 24).

[27] This has occurred within the last 25 years. See J Harlan 'Environmental Policies in the New Millenium: Incentive-Based Approaches to Environmental Management and Ecosystem Stewardship' (2000) Conference Summary. World Resources Institute, Washington DC.

[28] R Hahn and R Stavins 'Incentive Based Environmental Regulation: A New Era from an Old Idea?' (1991) 18 *Ecology Law Quarterly* 1 at 4-7 and 12-15.

[29] K Wilkie 'What's in it for me? - Exploring Natural Capital Incentives' (2005) Summary Report of the Natural Capital Incentives Initiative, Canada West Foundation, Canada.

mechanisms are often reactions to specific environmental problems,[30] whereas incentive-based tools have greater potential to be anticipatory in function.[31]

Incentive based instruments can provide an approach to regulation that is more efficient than command and control.[32] The rationale for this assertion lies in the claim, as stated above, that rewarding positive behaviour is more effective than sanctioning negative behaviour.[33] Incentive devices can be resource-saving and therefore attractive to governments facing severe resource constraints like South Africa.[34] The successful shifting of conservation responsibilities to private agents in their pursuit of self interest can decrease resource costs for the same output or, for the same costs, can increase output in volume or value, or both.[35] In both instances there is an efficiency gain.

In terms of flexibility, incentive-based approaches are asserted to deal better with the complexity of considerations that environmental issues entail.[36] One such source of complexity attaches to private biodiversity conservation. If incentive creation can be designed to reward the achievement of specific environmental goals scope may be created for innovation in the exploitation of natural resources combined with preservation of biodiversity.[37] Enterprises, in accordance with their profit-seeking nature, look for new cheaper ways to achieve environmental obligations. Whereas command and control approaches, with human decisions prescribed by regulation, may because of this design feature inhibit innovation.[38] But this is tentative because the needed research is complex and incomplete. In South Africa this observation[39] has particular pertinence as the lack of capacity in many levels of government means that if the private sector takes more responsibility[40] for conservation the state can play a lesser role in doing so.[41]

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[30] For instance, command and control approaches focus on righting *consequences* through prohibition. Say a resource user engages in activity 'A' without a permit, then they will face penalty 'B'. But this does not deal with the preferences of the resource user in engaging in activity A in the first place. Top-down control also provides no motivation and reward for initiative which means that individuals will constantly be looking for ways to get around rigid regulation rather than seeing it as a personal gain proactively to take measures.

[31] It needs to be noted though that both approaches are geared to deal with specific environmental problems, whether these problems are currently being experienced or are likely to emerge in the future based on assessment of the current state of affairs.

[32] R Stavins 'Environmental Economics' (2007) *National Bureau of Economic Research: Working Paper* 13574 at 9-10.

[33] R Stauth and P Baskind 'Chapter 3: Resource Economics' in R Fuggle & A Rabie (eds) Environmental Concerns in South Africa (1992) at 27-52 and A Jaffe, R Newell, R Stavins 'A tale of two Market Failures: Technology and Environmental Policy' Ecological Economics 54 (2005) 164 at 165-166 and 171-174.

[34] N Bruce and G Ellis 'Environmental Taxes and Policies for Developing Countries' (1993) *World Bank Policy Research Working Paper* No. WPS1177.

[35] For discussion of the evidence backing up contentions of this kind see M J Berger et al 'Providing Economic Incentives in Environmental Regulation' (1991) *Yale Journal on Regulation* 463.

[36] Hahn and Stavins "Incentive based regulation" (*supra* note 28).

[37] D James 'Environmental incentives: Australian experience with economic instruments for environmental management' (2007) Economics research paper No. 5, Commissioned by Environment Australia, Ecosystems Pty Ltd.

[38] Kidd "Criminal sanctions" (*supra* note 24).

[39] Reference here is to the preceding observation about inflexibility and administrative demands.

[40] It needs to be noted that in theory private land owners have a legislated Duty of Care to take responsibility for any environmental degradation they will be causing or have caused in the past under

But if one takes the government's limited capacity to implement and enforce regulation out of the equation, the environmental costs to a resource user responsible for amelioration may not be a significant proportion of his/her total cost of production. In such situations market influence on the resource user's behaviour in response to price signals could be weak. A measure of intervention may then still be needed. The problem is the difficulty of identifying these circumstances in advance of deciding on the right policy mixture.

A flexible self-regulated[42] or co-regulated [43] system, allowing private agents to adapt so as to achieve environmental goals, may save costs and may result in environmental threats being responded to more efficiently than the ways prescribed by a command and control system.[44] However command approaches may be indispensable as well as efficient in setting the overriding environmental goals in the first place. If correct this supports an argument for a blend between direct regulation and incentive provisions.

Regulation traditionally focuses on supply-side controls to the neglect of demand-side management. This is a pertinent consideration in South Africa given the increasing impacts of development, i.e. demand forces, on non-renewable resources like species of flora and fauna on the brink of extinction.

It needs noting that the nature of the relationship between the state and the regulated community is also pertinent. Members of the community being regulated are often productive agents in society who make valuable contributions to the economy. In circumstances where the environment is adversely affected by private individuals, such negative infringement is not necessarily through wilful disregard for the law but rather from ignorance and negligence.[45] Control regulation, specifically the outright use of penalties and criminal sanctions should, as matters of efficiency and equity, be a last resort and not pose a deterrent to willing private co-operation.[46]

Section 28 of NEMA. In practice however, the utility this provision has in small scale private sector activities without the creation of dedicated incentives for landowners to abide by this provision is likely to be limited.

[41] Kidd "Criminal sanctions" (*op cit* note 38) notes that, although the role of government tends to be reduced by incentive-based approaches to being a monitor, ultimate responsibility cannot be removed completely.

[42] Self-regulatory instruments are not state-centered, but rather are initiated by industry.

[43] These are different from self-regulatory instruments in that the objectives and standards are prescribed by the state and not industry. The determination of the mechanisms to achieve these objectives and standards, however, is left to the discretion of industry. For a discussion of the distinction between the two systems (self-regulatory and co-regulatory) see J Hanks 'Achieving Industrial Sustainable Development in South Africa: What Role for 'Self-Regulatory' and 'Co-Regulatory Instruments' (1998) 5 *South African Journal of Environmental Law and Policy* at 310-312

[44] Because of the capacity and resource constraints suffered by government, private sector initiatives may be more efficient in achieving environmental goals prescribed by government than in situations where the technical and legal conditions needed to be specified too.

[45] Kidd "Criminal sanctions" (*supra* note 24) at 21.

[46] Kidd "Criminal sanctions" (*supra* note 24) at 31 points out that a response to blanket threats of strict regulation may result in a 'culture of resistance' developing amongst companies that would have voluntarily complied in the first place.

Although the hurdles to effective implementation of such mechanisms are likely to be different in our institutional environment to those in countries like the USA and Australia, South Africa could nevertheless benefit from considering the approaches employed by states facing the same prospective impacts on biodiversity.[47] Other countries including Australia,[48] Canada, the US, [49] Kenya [50] and Costa Rica [51] are experimenting with variations on standard regulatory measures. These include instruments that enable and encourage individuals, companies, environmental organisations and communities themselves to participate in the conservation process.[52]

It is therefore not surprising that a number of international and regional environmental instruments to which South Africa is a signatory, as well as domestic policy frameworks, advocate the adoption of a more incentive based approach to regulation.[53] Aspects of these policy frameworks will be elaborated on further on in this dissertation.

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[47] The facts may be different but the determining variables are the same.

[48] James "Australian incentives" (*supra* note 37*)* at 90.

[49] I Bowles et al 'Economic incentives and legal tools for private sector conservation' (1997) *Duke Environmental Law and Policy Journal*, 212.

[50] N Gitahi 'Easements and wildlife conservation in Kenya' (2004) Unpublished paper presented at the second *Colloquium of the World Conservation Union Academy of Environmental Law*, held in Nairobi from 4-8, October.

[51] D C Stockford 'Property tax assessment of conservation easements' (1990) 17 *Boston College Environmental Affairs Law Review* 824, Morrisette.

[52] For instance, Kenya , the USA, Costa Rica and Australia have enacted legislation that provides specifically for the innovation of conservation servitudes.

[53] Examples of international instruments include article 11 of the *Convention on Biological Diversity*; numerous places in the *Convention on Wetlands of International Importance Especially as Waterfowl Habitats* including Resolution VIII.23, par 3 and 4; article 13 (1) of the *Stockholm Convention on Persistent Organic Pollutants* and article 2 (1) (a) (v) of the *Kyoto Protocol*. A regional policy document endorsing the adoption of incentives is the *Johannesburg Plan of Implementation Report of the World Summit on Sustainable Development* (2002) 41 ILM 1480, see paragraphs 16; 19 (b); 26 (b); 40 (k). Domestic policy documents endorsing the approach include Deloitte & Touche Consortium of Consultant *Environmental Resource Economics Discussion Document Three – The Proposed Method for the Introduction of Economic Instruments as Tools of Environmental Management in South Africa* (1996) Department of Environmental Affairs and Tourism, at 1, that identifies incentives as'…potentially powerful weapons in the defence of the environment' and that environmental management is all about offering the private sector a combination of 'incentives, rewards and punishments', *White Paper on Environmental Management Policy for South Africa* (GN 749 in *Government Gazette* 18894 dated 15 May 1998). The *White Paper* sets the context for all future environmental regulation in South Africa and it notably acknowledges the valuable role of incentives at 7, 32, 53, 74, 81 and 86 as well as *People-Planet-Prosperity: A Strategic Framework for Sustainable Development in South Africa: Draft Discussion Document* (GN 1486 in *Government Gazette* 29293 dated 20 October 2006) at 94, 97, 121, 131, 168 and 171.

2.2 Reliance on protected areas

When privately owned land is declared protected, this entails a range of restrictions placed on it to regulate its use, including human access of any kind in the long term. These stipulations aim to sustain the conservation value of the land in question including its biodiversity status, but policy intentions can also be wider and vary in accordance with the legal classification applied to that land. A constraint is brought into being in that restrictions often impact on the physical amount and value of economic benefits that the piece of land can provide under its new status. Therefore the net effect will influence the willingness of private landowners to participate in the biodiversity conservation process. In practice this cannot always be anticipated.[54]

If protected areas are to be increased, say from five to ten percent of the total area under all forms of ownership,[55] then protected area designation (usually) needs to be extended into the private sector. Given the dominant objective to be profit-seeking from land exploitation, the instruments used to achieve this increase in protected land needs to be effective as well as efficient. That is, cost must be minimised and gain maximised in each case.

This research on policy alternatives is conducted with a presupposition in mind, namely, that a key task in environmental management has always been to balance conflicting considerations. Along with every approach to environmental protection there are accompanying drawbacks. The optimal choice has to be a selection of means that achieves the desired objectives while attending in the process to the multitude of outcomes that may not mutually cohere. Given the shortcomings of the protected area regime mentioned below, the exclusive use of the mechanisms it provides for biodiversity conservation is wholly unlikely to make it the optimal choice.

Historically, the formal legal protection of specified areas in South Africa was complicated by a range of administrative variables wide in scope. These considerations entail overlaps between jurisdictions while at the same time imposing constraints on the capacity to act and the budgets of the responsible bodies.

The fragmented application of national legislation and the inconsistent classification of areas with recognised conservation value have also proved problematic. These deficiencies are reflected in the diversity of legal terms used to describe different categories within the range of protected areas in South Africa.[56] Although the number of

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[54] So positive economic incentives for landscape protection are essential mechanisms for success in private land declaration, yet effective devices are not easily designed in concrete situations.

[55] See A Paterson 'Property Tax: A Friend or Foe to Landscape Protection in South Africa' (2005) 12 *South African Journal of Environmental Law and Policy* 97 for a discussion about the objectives of ministerial statements to this end. Given the private ownership statistic already mentioned, coupled with the acknowledged biodiversity threat in South Africa, (Wynberg "decade of biodiversity conservation" (*supra* note 7) to achieve adequate levels of biodiversity conservation through the exclusive use of protected area mechanisms is likely to entail increasing the number of protected areas by more than this proportion.

[56] J Glazewski and A Paterson in Glazewski *Environmental Law in South Africa* (2005) LexisNexis Butterworths, Durban (Chapter 11) at 189.

applicable categories has been decreased by recent legislation[57], a comprehensive and uniform definition of protected areas for regulatory enforcement is still elusive. But that said, the following IUCN formulation has been adopted as an encompassing definition in the South African literature[58]: that is,

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, and managed through legal or other effective means.[59]

The process followed in the legal translation of any land into the status of a *protected* entity is affected by whether such land is initially state or privately owned. As will be argued below, the capacity of conservation mechanisms to attain their objectives is influenced by this division of ownership. But for manageable scope, the discussion of policy alternatives in this thesis is confined to the conservation potential of privately owned land. This section discusses briefly the legislative framework within which protected areas can be potentially expanded. The problems restricting the framework's operation and which thus undermine reliance on protected area declarations in South Africa are then examined.

2.2.1 Legislative framework

Paterson has done groundwork research on economic incentives that can be aimed at inducing land owners to seek formal legal protection of their land. [60] Yet there remains leeway for investigating the design and implementation of regulatory tools for land-managing bodies as well as for funding organisations. These initiatives have to ensure that biodiversity conservation measures remain effective in perpetuity and not merely during their initial operation. This is a tall order. That said, incentives for private sector conservation have proved to be useful in other national jurisdictions. Thus they may be effective also in the South African context when applied efficiently, bearing in mind the range of influences on their implementation that currently are without guiding precedents.

The Environmental Right in Section 24 of the Constitution imposes a duty on the state[61] that has resulted in the evolution of a swathe of framework legislation as well as environmental laws at the sectoral level. The interpretation of these laws and the practical nature of the environmental rights for individuals when these are instituted have received a measure of judicial attention in the post-constitutional era.[62]

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[57] National Environmental Management: Protected Areas Amendment Act (31 of 2004).
[58] Glazewski *Environmental Law in South Africa* (2005) (*supra* note 56).
[59] 'Guidelines for Protected Area Management Categories' (1994) IUCN.
[60] Paterson "Property tax" (*supra* note 55).
[61] The state's obligation is to '…take reasonable legislative and other measures that: (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources.' The Constitution (108 of 1996).
[62] For instance, see
1. Minister of Health and Welfare v Woodcarb Ltd & Another 1996 (3) SA 155 (N),
2. The Director: Mineral Development, Gauteng Region, and another *versus* Save the Vaal Environment & Others 1999 (2) SA 709 SCA and

One dimension in the implementation of these laws will be to seek a deliberate balance of command and control with incentive-based approaches when legislation can encompass a blend of the two. In potential, environmental laws can provide a range of devices for conservation which include the legal scope for the declaration of private land as possessing protected area status. The possibility of incentive measures evolving so that private agents can accomplish the same purpose is also implicit in the legislation. The following section discusses these incentive levers briefly, and separates them into those that determine the suitability of private land for inclusion into protected areas and those that facilitate such inclusion if and when judged suitable.

2.2.1.1 Legal tools affecting inclusion

Framework legislation

NEMA[63] and on a lesser scale ECA[64] are environmental laws intended to construct a regulating framework. NEMA contains a range of principles to be considered in the interpretation of all sectoral environmental laws and further, in theory, to co-ordinate the functions of environmental authorities in giving effect to the principles of co-operative governance in the constitution. In practice at present, co-operative governance is not yet recognisable in the mandate aimed at co-ordination of these authorities. Yet landscape protection is an integral feature, perhaps even the most prominent of the components of biodiversity conservation. [65] So the NEMA principles are highly pertinent in devising the legal tools to be used in private landscape conservation.

NEMA also has a Section 28 Duty of Care (the DOC) and a Section 30 Emergency Incident Protocol that apply in any sphere of economic activity prone to significant environmental impact. In theory the DOC has thus a dual purpose in private sector protected area declaration. For instance, a private land owner whose DOC is triggered may have no affordable alternative but to comply with the provision and thereby avoid causing a negative effect on the environment. This may entail the owner initiating the declaratory processing of his or her land in order to avoid its possible degradation. In this manner the DOC can act as a pre-emptive tool.

Thus the broad applicability of the DOC and the potential liability it imposes prospectively for those upon whom the obligation lies may by itself stimulate anticipation and avoiding action in individual owners. By appropriate design this likelihood should increase in direct proportion to the ecological sensitivity of the landscape privately owned. In this manner, the DOC acts as a disincentive, i.e. prompting action to avoid negative liability for environmental degradation. The DOC is useful too in enforcement

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3. BP Southern Africa (Pty) Ltd v MEC for Agriculture, Conservation, Environment and Land Affairs 2004 (5) SA 124 (W).

[63] The National Environmental Management Act (107 of 1998).

[64] The Environmental Conservation Act (73 of 1989).

[65] Paterson "Property tax" (*supra* note 55) notes that '…landscape constitutes an integral part of the environment…' This is why organs of state need to consider the NEMA principles when exercising functions which may impact on South African landscapes.

as it is administratively easy to use,[66] and it gives authorities the opportunity to react and recover costs where these apply.

Planning legislation

Planning legislation influences landscape conservation at national, regional and local levels. For instance, there are national EIA regulations but administered by provincial departments. This provides leeway for regional manipulations of the thresholds stipulated in the regulations, depending on perceived provincial environmental needs. In addition, integrated development plans[67], structure plans and zoning schemes for example, are produced by local authorities. All these powers affect the declaration of protected areas (and general landscape protection), but due to the rationing of budgetary resources the interventions that result are not necessarily effective in the expansion of protected areas within the public sector.[68]

2.2.1.2 Legal tools for inclusion

Protected areas legislation

The Protected Areas Act prescribes a process for the declaration of private land as habitats meriting protection. It provides (1) for initiation of the process by a Minister, MEC or private land owner; (2) for public participation; (3) for differentiated tiers of category registration; and (4) for declaration procedures applicable to state and private land.

It also provides a management framework that contains different treatment regimes for different types of protected areas.[69] If implemented correctly it could be an important tool for ensuring the maintenance of protected areas in perpetuity once their initial declarations are completed.

The written agreement in the registration phase of the declaration process serves also to maintain the protected area's legal status under successive owners. If a written contract[70] is concluded between the private landowner and the government then such an agreement could be registered against the private property title-deed, making it binding on future owners.

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[66] Kidd "Criminal sanctions" (*supra* note 24) as well as M Kidd 'Some Thoughts on Statutory Directives Addressing Environmental Damage in South Africa' (2005) *South African Journal of Environmental Law and Policy* vol 2 60. Kidd states further that the competent authorities responsible for the issue of directives have demonstrated that they are not sure how to use the provision. The DOC's simplicity then is not sufficient in itself to offset the capacity constraints on state administration.

[67] In practice these are often not worth the paper they are typed on.

[68] Government needs to purchase private land in order to declare it protected but, as observed already a number of times, limits on capital expenditure make this difficult.

[69] This framework comprises a management authority, management plan, internal rules, performance indicators, annual reports, and it can mandate the termination of protected areas.

[70] Whether a written agreement between the private land-owner and the state is required or not depends on what level of ecological importance the land is accorded, and consequently what type of protected area it is liable to be designated as.

Natural resource legislation

In the existing body of natural resource legislation, the NWA and the Biodiversity Act do not provide legal tools expressly for protected area formation. In practice however, provision for the formulation of bio-regions under the Biodiversity Act alongside water catchment areas under the NWA echoes the procedures for declaration and management in the Protected Areas Act.

The Biodiversity Act states that bio-region designation may occur in any region which '…contains whole or several nested ecosystems and is characterized by its landforms, vegetation cover, human culture or history…'[71] Hence this category description places the land in question within the ambit of the definition of protected areas quoted in the introduction to this sub-section above.[72]

2.2.1.3 Incentives for inclusion

Protected areas need to be conserved in their natural or pristine state in order to serve their ecological purpose. If owner income is generated primarily from the exploitation of land through, for example, agriculture, plantations or mining, then expropriation of even limited property rights in the private sector might not leave residual rights that are economically sustainable.[73]

So in order to encourage more private landowners to initiate the declaration of their land as protected areas there needs to be both economic incentives in place sufficiently attractive for them to do so, along with an influential conservation culture in wider society. Recent decades have seen the emergence of numerous industrial country examples of such influences on policy action. As mentioned above, despite state resources to acquire land for designation as protected being chronically limited at the present time in South Africa, it is believed by policy makers and administrators that the alternative of direct regulation can prove to be even more expensive. This is projected presumably by costs per unit area. But such judgements about the long run merits of alternative policy directions are found in the international literature.[74]

The stipulated hierarchy of protected areas also needs to influence the design of suitable incentives. For instance, the economic inducements available to landowners choosing to

[71] Section 40(1)
[72] The tools contained in these two pieces of legislation are *prima facie* similar in effect to those in the Protected Areas Act. But there are of course pertinent differences that need to be disentangled if their implementation is to be efficient.
[73] The likelihood of this outcome will be governed by the prevailing strength of environmental values, by recognized rights and by social priorities. These comprise a complex mix of influences on policy. The process is certainly not static and therefore to predict the outcome *a priori* is difficult.
[74] J Aronson et al *Restoring natural capital: science, business, and practice* (2007), Island Press, Washington DC at 88.

declare their land should hinge on the importance of the type of protected area under which the land in question is to be categorised.[75]

Property tax

Property tax incentives to landowners choosing to declare their land as protected areas have been proposed by Paterson.[76] It is not necessary to describe the details of this approach here, but its scope is pertinent to the research questions under discussion. The Property Rates Act contains mechanisms for subjecting privately-owned properties to differential rates of tax in accordance with their use and location.[77] In the case of environmental indicators of land quality, Paterson suggests a tiered approach in which tax benefits are given to landowners appropriate to the protected area status that their designated land merits. Private owners of ecologically sensitive land subject to extensive land-use constraints would be accorded the highest property tax benefits in lowered rates.

Some forms of farming may be more compatible with protected area designation relatively speaking. For instance, game farming that caters for the commercial and recreational hunting industry can be more conducive to sustaining and even restoring the biodiversity of natural veld than is the bulk of other activities falling within the definition of 'agricultural purposes'.[78] But it should be noted that the botanical and ecological research on different cultivating and grazing practices is not yet complete.[79]

The discussion below concerning the application of fiscal measures to environmental protection problems is useful for understanding the role of tax differentiation in South Africa. The issue was introduced above but only in the context of protected areas.

2.2.2 Political situation

In recent decades there has been a shift away from viewing natural resources in general and protected areas in particular merely as valuable assets worthy of protection. The new perspective is that economically sustainable conservation and environmentally sustainable development are complementary objectives.[80] If this presumption is correct,

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[75] This is dictated by decisions concerning the ecological sensitivity and the environmental significance of the land. Therefore such judgments determine whether the land is to be a Special Nature Reserve, National Park, Nature Reserve or Protected Environment. Whether a written agreement is to be entered into between the landowner and the minister or MEC depends also on the type of protected area to be designated.

[76] Paterson "Property tax" (*supra* note 55).

[77] Section 8 of the Local Government: Municipal Property Rates Act (6 of 2004).

[78] Another example is the land designated as protected in accordance with the objectives of the Biodiversity Corridor Project. I have interviewed a number of private landowners who signed contracts submitting their land for use in this project and thereby voluntarily limited their land-use practices. A number of them mentioned that a key factor in their co-operation was that certain proportions[78] of their farms, by spatial extent, are marginal or unusable for the land-use practices they are currently engaging in.

[79] For example see N Tainton *Veld Management in South Africa* (1999), University of Natal Press, Pietermaritzburg as well as W R J Dean and S J Milton *The Karoo: ecological patterns and processes* (1999), Cambridge University Press, Cambridge.

[80] See *White Paper on Biodiversity* (*supra*, chapter 3 (D), although this general concept is reiterated in numerous other domestic policy documents, for instance in environmental legislation (see the Preamble to

then a facilitating framework of laws and policies needs to be put in place. The change from a global paradigm protectionist in its intent to one that makes public participation itself a component of sustainable exploitation is a further characteristic of this new recognition.[81]

The South African expression of this approach is evident in the trend for natural resources to be placed in the public trust,[82] with the objectives laid down for their use decided in partnership with the people considered to be legitimate stakeholders. Yet this practice with its political rationale is taken one step further to give protected areas an added dimension of protection in the South African context. Sustainable resource management, and specifically community based conservation[83], are judged by policy-makers as provisions either capable of balancing prospective development with conservation or as incapable of doing so.[84]

The new legal instruments[85] appear also to have stimulated rural development, but in certain cases resulting in encroachment on ecologically sensitive landscapes.[86] If the indicated legislative and policy tools are not put in place and implemented effectively, the balance desired on social grounds may not be achieved sustainably.[87] With ongoing pressure for development from population growth South Africa's status as the third most biologically diverse country in the world might then be short-lived.

2.2.3 Resource limitations

The government faces constraints in facilitating the declaration process under the protected areas framework. This pertains to its administrative capacity as well as to its finances. Thus the role that protected area extensions can play when aimed at increasing private conservation endeavours is limited. There is a clear need for alternative mechanisms to those available under protected areas legislation. In intention such devices encourage the participation of private land owners by facilitating their skill input and financial contribution to conservation. To be effective this should take place in a manner

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NEMA) and international environmental instruments with regard to biodiversity, for example, the Convention on Biological Diversity 31 *International Legal Materials* 818.

[81] One remaining scenario is where a measure of elitism can dictate use and access to protected areas. These would then be viewed by the policy agencies as having purely recreational value. But in practice under provisions motivated by this conception, the individuals who could benefit most from the resource are often excluded from access to it by the high price charged for access.

[82] For example, see section 3 of the NWA, section 3 of the MPRDA, section 3 of the Protected Areas Act and section 3 of the Biodiversity Act.

[83] Glazewski *Environmental Law in South Africa* (2005) (*supra* note 56) at 326.

[84] In addition, these methods have the potential to address certain socio-political problems that result from pre-constitutional apartheid policies. Or at least they provide operational scope for doing this. Thus if micro level tweaking is feasible, protected area legislation may be capable of balancing development as well as transformation objectives on the one hand with conservation on the other. If put into practice this will entail trading-off land redistribution initiatives against biodiversity gains and landscape conservation. This would be fraught with political as well as economic difficulties.

[85] In the National Environmental Management: Protected Areas Amendment Act (31 of 2004).

[86] Paterson "Property tax" (*supra* note 55) at 97.

[87] I am not implying that these tools are not yet available and used in South Africa, but I am suggesting a hypothetical outcome in which long-term sustainability becomes difficult to achieve.

that makes up for inconsistencies in the results of the policy levers available under the protected areas legislation.

Proclaimed *Protected Areas* in South Africa are seldom financially self-sufficient and most require significant subsidies and donations in order to be operational, that is, to meet their conservation objectives. In general a protected area declaration in its current formulation is a financially limited instrument. As such it is unlikely by itself to achieve higher socially desirable levels of sustainability in land use practices under private ownership.

In a policy perspective it is pertinent therefore to recognise in the international literature the potential scope for economic instruments in managing the environment. In other countries this realisation is coupled to the understanding in national governments that economic levers may achieve environmental objectives in more cost-effective ways than traditional command-and-control regulatory mechanisms.[88] The potential for methods brought into being by specific legislation[89] to supplement the working of protected areas tools in private conservation provides the impetus for this study in environmental law. Thus the aim is to discuss the devices available under individual pieces of legislation, and to consider whether these can fill gaps left by protected areas provisions through encouragement of environmentally sustainable practices by private landowners.

2.2.4 Planning inconsistencies

The Protected Areas Act states that management plans produced by the responsible authorities have to be aligned with other planning initiatives such as integrated development plans (IDPs) and biodiversity management plans. Integrated planning is intended to take into account interventions aimed at by legislation other than this act. But expanded protected areas declaration does not provide a sufficiently overarching framework.[90] This is a serious concern when one considers the diversity of influences that govern the implementation and conduct of a protected areas regime, and which therefore should feed into decision procedures. Thus one must look to other legislation for the planning tools necessary to make the protected area network, as designated under successive declarations, effective and representative.[91]

The planning framework brought into being by various legal acts may in itself contribute to make the protected areas programme workable. The acts discussed below also provide channels for setting up organisations and institutions to cater for sector-specific conservation, as well as for an array of private-public agreements and partnership possibilities. The written undertakings between landowners and government authorities under the Protected Areas Act are intended to balance landowner and conservation

[88] James "Australian incentives" (*supra* note 37) at 13.
[89] The reference here is to legal mechanisms available outside of Protected Areas legislation.
[90] A Paterson 'Wandering about South Africa's Protected Areas Regime' (2007) *SA Public Law* 22(1) 1-33 at 3.
[91] The protected area framework is representative if it reflects the quantity and variety of protected areas suitable on a national level.

imperatives. One problem is that these undertakings can be extremely vague and in need of enhancement in the form of guidelines.[92]

2.2.5 Geographical fragmentation

Designated protected areas are judged not to be managed or administered in a holistic manner in South Africa.[93] This is the case with the functioning of Protected Areas when assessed within broader management contexts. Protected status affects how cohesively the land functions as a unit within regional networks or corridors.[94] Where fragmentation exists it limits the utility of protected areas as conservation tools when these are declared in the private sector, for instance, where endangered species exist in small separated groups on private land. Clear instances are the scattered habitats of the Riverine Rabbit in the north-western Karoo and of certain lily species in the Cape Fynbos Biome. Therefore it is acknowledged that other tools outside of the legal framework provided by protected areas legislation[95] are needed to rectify the skewed incidence and uneven functioning of protected areas in South Africa. These may yield higher levels of integration in the conservation system.

2.2.6 Exclusion

In the past national governments approached conservation in ways that did not encourage local communities to participate equally in the implementation process.[96] This is a pertinent concern in protected areas as communities are often excluded by the policy implementation from using or managing land that has been ear-marked for conservation purposes. The displacement of communities from land they consider part of their natural heritage – that occurred for political reasons in the past - is a historical legacy in South Africa that complicates the search for new approaches.[97]

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[92] Paterson "Protected areas regime" (*supra* note 90) at 4.

[93] The sheer number of laws, types of protected area and administering departments at all levels vouch for this fact. For a comprehensive listing of laws and administering departments see Paterson "Protected areas regime" (*supra* note 90) at 7. For a list of the types of protected areas see Glazewski and Paterson 'Land Reform and Agricultural Resources' in Glazewski *Environmental law in South Africa* (*supra* note 56) at 325.

[94] The problem arises because protected area distributions across a region are often fragmented in ways unrelated to the ecological nature of the area being protected. So they occur as *islands*. But as already stated, contiguity between protected areas is necessary for the policy to function holistically. Uneven cooperation between private land-owners in the designation process is a key factor weakening policy.

[95] National Environmental Management: Protected Areas Act 57 of 2003 as amended by the National Environmental Management: Protected Areas Amendment Act (31 of 2004).

[96] A Kiss (ed) 'Living with wildlife resource: wildlife resource management with local participation in Africa' (2006), *World Bank Technical Paper* No. 130 – Africa Technical Department Series 5.

[97] Local sensitivities about conservation are therefore particularly pertinent to the design of policy innovations. The inclusion of communities in designating and managing protected areas is crucial on social as well as political grounds if they are to benefit disproportionately *more* in the longer term from the declaration of protected areas to which they have a claim.

2.2.7 Perpetual status

Under the old protected areas regime there was a wide range of official bodies charged with the authority to regulate the conditions under which formal protected areas were to be preserved. Also no assurance was forthcoming that the formal status of a protected area was consistently registered against the title deed of a designated property. Thus the status of the land's environmental protection in perpetuity was left uncertain.

2.2.8 Economic incentives

The use of legal mechanisms might best be coupled to a national property tax system that can provide private owners with an incentive that stimulates use of conservation devices.[98] For instance, tax expenditures in general (as tax concessions are known in the public finance literature) could encourage the implementation of conservation tools such as the protected area declaration process in South Africa. This is one potential use of tax instruments whose purpose is to encourage landowners to initiate the process themselves rather than wait for the state to do so.[99]

The role that incentives can play in reconciling the objectives of economic development and environmental protection can be observed in the growing consumer demand for environmentally friendly or *green* products.

2.2.9 Concluding remark

To complicate policy formation, putting in place protected areas can conflict as an objective with the fundamental human value constituted by biodiversity, namely, the preservation of species *diversity* into the future. But different levels – in the sense of species numbers and hierarchy - are inherent in the concept of biological diversity. It is quite possible that if one level is conserved only piecemeal, the remaining levels may be negatively affected by ongoing economic exploitation. So to allow for differentiated effects, protected area designations, for instance, aim to protect ecosystem, species and genetic diversity by controlling the manner in which *all* anthropogenic activities impact upon them.

If protected areas are formed to shield an identified species[100], then the *wider* ecosystem within which the species is embedded as well as the diversity at the *narrower* genetic

[98] An idea outlined by Paterson "Property tax" (*supra* note 55).
[99] This would mean in most instances the purchase of private land by government in South Africa but, as already argued, for the foreseeable future the state is unlikely to have significant financial capacity to do so.
[100] This consideration is not confined to protected areas. For instance, section 43 of the Biodiversity Act states that biodiversity management plans can be produced for 'an indigenous species – (i) listed in terms of section 56; or (ii) which is not listed in terms of section 56 but which does warrant special conservation attention'.

scale may not be given due consideration.[101] This would mean that diversity at the two indirectly affected levels may ultimately be reduced.

For instance, genetic drift and gene flow are key forces in evolution. They contribute to population variation across space which also enables natural selection to take place through time. Protected areas by design restrict such genetic drift and gene flow, which indirectly has an impact on variation - a dimension of species diversity - and consequently on the pace of evolution. With diversity as the raw-material upon which natural selection operates, the evolution of genes, species and ecosystems in a protected area can take place only within a framework restricted by human intervention. In such areas this constraining grid is an imposed one, and although viable and effective conservation processes are occurring, some manipulation of the environment is taking place on the broadest level simultaneously.

So the aim of instituting environmental control in the long run can inadvertently serve to restrict the natural development of diversity.[102] To place this possibility in perspective we need reminding that conservation is a human construct. In general then imposing conservation measures on the environment, in order to conserve natural habitat characteristics judged important, will also modify it to a degree. It follows that as an exclusive option to increase biodiversity conservation, the declaration of protected areas may not be an optimal choice. Yet given that the environment is already divided into private landscape segments greatly in need of protection, enhancing conservation would be a meaningless endeavour without having at hand a number of protected areas to conserve biodiversity.

2.3 To sum up

2.3.1 Need to create mechanisms to conserve inside and outside protected areas

In view of their limitations the sole use of protected area mechanisms has been argued to be an inadequate tool to achieve sufficient levels of biodiversity conservation in South Africa. Their problems range from: (1) administrative variables like socio-political considerations that can block environmentally compelling declarations; (2) resource constraints on the state; (3) issues of long-term security; (4) broader theoretical issues like geographical fragmentation; and (5), no incentive-based designation provisions in place. The incidence of biodiversity is also not constrained by property or jurisdictional

[101] The focus on conserving *flagship* species, those that attract tourism and monetary donations, and on *keystone* species, those that anchor an ecosystem, supports the observation that human intervention is likely to be an influential factor on all levels of decision.

[102] An example is the allocation of licenses for the breeding as well as culling of natural populations. Although the licensing system means that the industry is potentially controllable, the selection that takes place on a genetic level is undoubtedly being driven by human choice which itself is dictated by prevailing marketplace demands such as trophy and meat prices. Anthropogenic forces on selection are likely to operate on the genetic as well as species levels, and ultimately modify the ecosystems within which the controlled indigenous species shape their own habitats. If there is human preference for a specific type then that type will be selected, thereby limiting genetic diversity and the rate of species evolution.

boundaries.[103] Mechanisms used to raise biodiversity levels therefore need to be applicable in different contexts of responsibility, and thus to function as components within broader biodiversity management regimes.

2.3.2 Need to create incentives

The comparison of command-and-control with incentive creation does not argue for the exclusive application of one approach over the other. The limitations inherent in direct regulatory approaches range from the constraints placed on private innovation, adaptation and efficiency, to the imposition of excessive administrative costs and regulatory responsibility on the state. The latter is a pertinent concern in South Africa as elsewhere.[104] The preference for a proactive rather than reactive approach reinforces the argument for the inclusion of incentive devices.[105] It will be expanded on below that the blend of providing scope for individual choice along with direct regulation is arguably the most suitable approach in South Africa.

3. MECHANISMS TO CONSERVE BIODIVERSITY OUTSIDE PROTECTED AREAS

Considering first, the fragile status of biodiversity in South Africa and second, the range of activities potentially detrimental to its preservation, the list of remedial mechanisms available is extensive. Extension of protected areas is clearly one useful tool. But for reasons already mentioned it is judged by researchers and some policy makers to be insufficient on its own to achieve adequate levels of conservation in South Africa. This dissertation focuses on policy levers or mechanisms deemed *most* important as well as most feasible for local deployment.

Devices of ancillary relevance are not analysed to the same level of detail so are mentioned only fleetingly. Instruments that (1) co-opt support for the establishment of conservation organisations; (2) comprise co-management agreements; as well as (3) foster sustainable land-use practices in the private sphere, comprise the distinctions most useful here.

All mechanisms need to be implemented through suitable incentive avenues. But for clarity, within the range that policies comprise, what are judged different approaches are discussed separately. The analysis of incentive devices is left to **section four**.

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[103] This illuminates the governance requirements alluded to in the Ostrom "Institutional analysis" (*supra* note 1) quotation at the head of this paper. In other words, variety in the selection of available mechanisms is essential.

[104] The fact that command and control approaches fail to remedy market failure, due to the production and consumption of environmental goods and services without market values, is also particularly pertinent here.

[105] The fact that incentive approaches may be better suited to deal with externalities will be discussed once the types of incentive devices have been categorized in section 4.

3.1 Conservation organisations

Membership of conservation organisations is a potentially valuable mechanism to promote biodiversity conservation outside of protected areas. Organisations brought into being for environmental defence or restoration provides an opportunity for private individuals to illustrate leadership by meeting various indicators of environmental performance.[106] They are useful institutions for undertaking research, rehabilitating degraded areas, educating, eliciting contextual information and enforcing internal rules, all of which may contribute to conserving biodiversity. Additionally, once best practice has been established, the fact that organisations exist may itself be a dimension of environmental concern that stimulates participation in the market for particular 'green' products associated with members as producers.[107]

As will be seen below, the formation of conservation organisations often results in a set of internal rules for the members of the organisations to abide by. As these rules become implemented, if they serve to further the objectives of the legislated act that provided for the organisation to be formed, the regulatory burden on the state for the area within which the organisation functions will decrease. Coupled with this decrease in necessary state coercion will be a lessening of administrative costs and through recognition an emphasis on the value of environmental resources in state hands.

Key legislation providing for the establishment of different forms of conservation organisations is CARA, the NVFFA, the NWA, the Non-Profit Organisations Act and the Income Tax Act. Legislative provisions that provide for the (array of forms of) conservation organisations will be discussed in the following section.

3.1.1 Conservation committees[108]

By general agreement agriculture poses the biggest threat to biodiversity in South Africa, although the evidence backing this judgement will not be presented here.[109] It follows that any policy mechanisms and institutions that serve to increase sustainability in agricultural practices, as long as they do not generate perverse incentives, can be useful tools for conserving biodiversity in the private sector. Conservation committees are

[106] But clearly this depends on the incurred costs in foregone income.
[107] This would take place through information channels like labelling that identify producers with organisations and environmental causes. This is discussed in following sections. The existence of organisations may contribute also towards higher cost-effectiveness for individual members as producers in certain sectors. When the flow of information is increased through the establishment of organisations, whether between individual members or between the state and the organisation, these collective exchanges can induce higher levels of efficiency in achieving environmental goals. It can further determine best practice that is specific to different habitats, regions or economic sectors.
[108] Conservation committees are established under the Conservation of Agricultural Resources Act 43 of 1983 and includes Soil Conservation Committees established under the Soil Conservation Act (76 of 1969). Section 15 (3)(f) of CARA states that such committees shall be deemed to have been established under its section 15 (1).
[109] White Paper on the Conservation and Use of South Africa's Biodiversity ('White Paper on Biodiversity') (in GN 1095 GG 18163 of 28 July 1997) at 12.

obligated to conserve agricultural resources in particular.[110] Given that the amount in place and the fertility of soil is integrally linked to biodiversity then conservation is a plausible objective of these committees.

CARA provides for the establishment of conservation committees[111] for specific areas determined by the responsible Minister. These committees are obliged to[112] conserve the natural agricultural resources in the designated area[113] in a manner that furthers the objectives of CARA. Objectives laid out that are of particular importance to private biodiversity conservation include(1) maintaining the production potential of land; (2) conserving *natural* agricultural resources (such as water one presumes); (3) preventing the *destruction* of water resources; (4) preventing erosion; (5) protecting vegetation and (6) combating weeds and invader plant infestation.[114]

Conservation committees are also obligated to advise the Department of Agriculture[115] on matters regarding the implementation of the Soil Conservation Act and on any related scheme in the area in which they are formed.[116] In this manner they ease the regulatory burden placed on the relevant authority operating locally.[117]

Realising the objectives of CARA is a complex affair as it entails the balancing of agricultural development with conservation in such a way that both objectives are encouraged. In this sense the two hats that the Department of Agriculture wears will be reflected in the duties of conservation committees.

3.1.2 Regional conservation committees

Regional conservation committees under CARA[118] are established in similar ways to the area committees mentioned in 3.1.1 but they play more of an advisory than implementing role. They advise conservation committees as well as responsible state departments about the need and extent of the act's required application, or about the obligations incurred under the act by a particular Scheme[119] in the region in which the committee is charged with supervising the furtherance of CARA objectives.

[110] Section 15 (2) (a).
[111] Section 15.
[112] This is also a section 15(2)(a) obligation.
[113] This is the particular privately owned area for which the conservation committee was established.
[114] These are laid out in section 3.
[115] The department that administers the act, which is currently the Department of Agriculture.
[116] Section 15 (2) (b).
[117] Accordingly they save such bodies administrative costs as well.
[118] Section 16.
[119] Established under section 8.

3.1.3 Fire Protection Associations[120]

Although fynbos is a fire-adapted system of vegetation,[121] it is difficult to use fire in anthropogenically modified landscapes for constructive purposes. Just one or two fires at the wrong times of year or at the incorrect frequency over a period can cause additional stress for many indigenous localised species.[122] Fire protection associations (FPAs) can reduce the likelihood of fires occurring in a region and therefore can have a positive impact on fynbos biodiversity.

Accordingly the NVFFA provides for the establishment[123] of FPAs.[124] Landowners in an area specified as vulnerable[125] may co-operate with one another to form and register FPAs for the collective furtherance of the conservation objectives listed in the NVFFA.[126]

These FPAs are obliged to develop and apply veld-fire management strategies for the areas they are assigned to manage with the aim of reducing veld-fire risk in its area of responsibility. They have an obligation to co-operate with neighbouring FPAs.[127] Fire associations must further design rules concerning fire prevention and management which consequently become binding on all their members. In the wording of the act there is also reference to the fostering of community-based veld-fire management structures in the areas that the FPAs administer.[128]

Any existing association can register as an FPA, if it is formed under other environmental legislation or provincial ordinances that have the prevention and combating of veld-fire as one of its leading objectives[129], a functioning FPA being an example. For instance, Biodiversity Management associations or Water User associations could register under these provisions.

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[120] Fire protection associations are established under the National Veld and Forest Fire Act 101 of 1998 (the NVFFA).
[121] Tainton *Veld Management in South Africa* (*supra* note 79).
[122] Cape Nature Fact Sheet: Landowners Guide to Fire Management (2007), a document prepared for the *Critical Ecosystem Partnership Fund*.
[123] In fact Cape Nature is currently launching initiatives that urge landowners to develop FPAs. For more information see the Cape Nature Fact Sheet (*supra* note 127).
[124] Section 3.
[125] Section 3(2)(*a-d*) refers to areas of co-operation within which it would be suitable for FPAs to be formed, that is, where veld-fires are regular, or where there is a relatively uniform risk thereof, or there are uniform climatic conditions, or relatively uniform types of vegetation. Section 3 (3) and (4) provide further that if an FPA is not formed in such an area the Minister may provide discretionary advice as well as co-operation with landowners in order to facilitate the forming of such FPAs. Cape Nature is currently adopting this role.
[126] Section 3 (1), namely, '…for the purpose of predicting, preventing, managing and extinguishing veldfires…'
[127] Section 5 (1) (*a*).
[128] Section 5 (1) (*h*) *supra*.
[129] Section 4 (3)(a-g).

Financial and other assistance to Fire Protection Associations as well as to individuals who prepare firebreaks and incur unreasonable expenses in doing so is provided for under the NVFFA.[130]

The main incentive for land-owners to join FPAs may well be to meet regulations applicable to them.[131] To a profit-seeking owner it can appear cheaper to avoid having one's activities considered an offence under section 25 and consequently being subject to a penalty under section 24 if one is a member of an FPA.[132] Thus joining an FPA may be a means of lessening the likelihood of incurring liability for a fire if it were to break out on one's land. But the truth of this conjecture turns on the balancing of probabilities, which are the incurring of liability if one is not a member (and not paying fees) against the likelihood of doing so if one is a member of an FPA (while paying fees). These relative probabilities are not easily weighed up by the average land-owner, while the relevance of the decision depends on the alternative monetary costs.[133]

The formation of FPAs also promotes cost saving by ensuring that services are not duplicated by individual land-owners. Resources can be combined between members to manage fires more effectively than it is likely any individual landowner could. FPAs have the capacity to divide the provision of services efficiently between individual members so that all partners can save on the costs of measures implemented in their personal capacities.

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[130] Section 7 (a) and (b).

[131] It is important to note here though that there is no presumption of negligence in civil proceedings concerning fire damage.

[132] A related advantage is that section 6 delegates enforcement powers to Fire Protection Officers with regard to provisions of the act as well as to the rules of individual FPAs.

[133] For instance, section 25(4)(a) states that an individual is guilty of a second category offence if they fail '…to meet the standards of readiness for fire fighting referred to in section 17(1)'. Section 17(1)(b) states that land owners on whose land a veld-fire begins are obliged to ensure that, in their absence, '…[other] persons are present on or near his or her land who, in the event of fire, will (i) extinguish the fire or assist in doing so; and (ii) take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association…'. Surely the assurance that other individuals who own property surrounding one's own will assist in extinguishing a fire originating on one's property is more likely if one is a member of a co-operative institution specifically designed for such a purpose? This seems to be the thinking that underlies the drafting of this section.

Section 25(4)(b) states further that an individual is guilty of a second category offence if he or she fails to '…notify the persons referred to in section 18(1)'. Section 18 (1) states that a land owner 'who has reason to believe that a fire on his or her land or the land of an adjoining owner may endanger…the environment, must…(a) take all reasonable steps to notify (i) …the executive committee of the fire protection association…and (ii) the owners of adjoining land…' to avoid committing an offence. The duties of FPAs are outlined in section 5, so that 5(1)(b) states that FPAs must provide in their fire protection strategies '…agreed mechanisms for the co-ordination of actions with adjoining fire protection associations'. If a land-owner has the backing of a regional FPA he or she is likely to be in a better position to fulfil obligations under section 18(1)[133] than if they were non members. Functioning in this manner FPAs are a means through which communication between members can be improved for mutual benefit.

Membership of an FPA also entitles members to advice and assistance from state authorities. [134] Information regarding precautions and technology as well as scientific likelihood of a fire may be obtainable from state agencies. Access to such information is streamlined by FPA membership as FPAs operate in partnership with the government for a common objective.[135]

3.1.4 Water User Associations

Water is unquestionably a non-living resource that underpins the sustainability of all life in a region. Its availability is therefore a prerequisite to maintaining a certain level of biodiversity. The sustainability of any natural resource like plant and animal species is clearly affected by the nature and extent of water user activities.[136] The environmental record, international and local, contains a vast number of supporting examples, China being currently the location of many high profile instances like the Three Gorges Dam on the Yangtze River.[137] Therefore creating water-user associations (WUAs) with sound conservation objectives can have a positive impact on biodiversity.

Chapter 8 of the NWA provides for the establishment of WUAs. The establishment of such associations is a mechanism to foster co-operative public support between water users for ensuring localised sustainable water use in a specific region. Membership of a WAU is regarded by the NWA as 'buying-in' to the process of making water use (as managed by the relevant CMAs[138]) a sustainable activity for the mutual benefit of all members.

It should be clear to private land owners that water is not a natural resource with availability confined by property boundaries. Therefore it should not be difficult to convey the idea to water users that the sustainable management of water resources is achieved more effectively on the catchment scale than on individual properties. Such a presumption is spelled out clearly by the NWA within the framework of a national water resource strategy.[139] To secure sustainable access to water entails that co-operation between holders of legitimate rights of exploitation should be understood by private land-owners - regardless of other legislated obligations administered by catchment management agencies - as being in their individual self-interests.

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[134] Section 3 (4) provides for the Minister to '…give assistance to and co-operate with owners in forming a fire protection association.'
[135] Section 10 imposes an obligation on the state to communicate fire danger ratings to FPA members on a regular basis. Section 11 provides further for the designation of FPAs as institutions responsible for disseminating information regarding fire danger. The FPA can claim payment for providing this service.
[136] This factor is recognised in section 2 (g) of the NWA where the text states that water resources are to be conserved, managed and developed in ways which take into account 'protecting aquatic and associated ecosystems and their biological diversity.'
[137] J Yardley 'A troubled river mirrors China's path to modernity' (November, 2006) *The New York Times* 1-12.
[138] 'Catchment Management Agencies'.
[139] Section 5.

WUAs afford certain advantages to members and government that are similar to FPAs. The creation of WUAs that become effective institutions for self-regulation[140] are clearly in the state's interest to encourage. WUAs could save the state substantial outlays and also reduce the pressure on the administrative ability of catchment management agencies. The pooling of resources is also in the cost-saving interests of individual members and WUAs. It facilitates the distribution of useful information regarding conservation and sustainable use of water resources. WUAs get further assistance in achieving their objectives from the model constitution of water user associations contained in Schedule 5 of the NWA.

Because sustaining water access in perpetuity is an objective common to all WUAs, if private land-owners can value, however crudely, these long term gains it[141] should serve as a positive motive to join WUAs. But additional incentives are bound to be needed too, most likely from the market. This is why fostering co-operation for the formation of WUAs might best be pursued in conjunction with market-based incentives put in place for the purpose. These incentives are discussed further in section 4.1.2 below.

3.1.5 Public benefit organisations

The Income Tax Act provides for the establishment of 'public benefit organisations' (PBOs). One intention of these provisions is to assist private individuals to form conservation organisations. Although they are valuable in that they provide safeguards against conservation organisations being used as tax avoidance vehicles,[142] the stringency with which the Act regulates PBOs for tax avoidance also limits their utility[143] for biodiversity conservation purposes.

These stringent requirements include (1) the organisation must be an association that is not for gain[144] under the Companies Act; [145] (2) the objective of the PBO must be to further a public benefit activity; (3) the activities the organisation is involved in must be non-profit, so economic interests cannot be promoted at all;[146] and (4) the PBO cannot engage in any business which generates a share of income exceeding 15 percent of the gross income of the entire organisation.[147]

As stated already, although application of these requirements prevents individuals from forming PBOs as tax avoidance vehicles,[148] unfortunately it also constrains the capacity of PBOs to be formed for conservation purposes. For instance, the fact that PBOs cannot

[140] Or 'co-regulation', depending on the particular agreement with government that each WUA establishes.
[141] That is, security of sustained water access.
[142] A Paterson 'Tax incentives- valuable tools for biodiversity conservation in South Africa' (2005) (1) *South African Law Journal* 182 at 207.
[143] Section 30.
[144] Section 30 (3) (g).
[145] Act 61 of 1973.
[146] Section 30 (1) (b) (i), (ii) and (iii).
[147] Section 30 (3) (b) (iv) (aa).
[148] The point Paterson 'Biodiversity incentives' (*supra* note 142) makes is echoed here.

undertake activities that generate income for the sole purpose of funding their public benefit activities may mean that conservation organisations formed under these provisions may not be financially sustainable. In this way the formation of conservation organisations under these provisions may be discouraged because they can turn out not to be financially viable. So the fact that these provisions[149] exclude certain conservation organisations from recognition as PBOs means that these conservation organisations are not entitled to certain tax benefits.[150]

3.1.6 Obstacles to the use of organisations for biodiversity conservation

A legitimate concern in policy formation is that in the absence of direct regulation there is weaker assurance that environmental objectives will be achieved through organisation-based mechanisms should these be relied upon wholly.[151] For example, if district organisations are voluntary, then there is no guarantee that the most important environmental decision-takers in the locality will participate.

Additionally, in the absence of regulation to govern participant behaviour then certain members may co-operate more than others.[152] This places an unfair burden on members that participate voluntarily, a problem well documented in the literature on collective action.[153]

The solution here is to foster public *buy-in* so as to overcome the free-riding behaviour by inactive members of any and every voluntary organisation. But how this is most efficiently done remains a difficulty in policy design.

There is often scepticism in the private sector, particularly amongst farmers, about certain projections of environmental risk. In contrast, these are held to be valid by policy-makers in government.[154] This sceptical outlook endures regardless of the unanticipated costs likely to infringe on land users' current as well as future levels of resource access. A common example is the over-grazing of vegetation by successive generations of land users despite visible signs of deterioration. This observation about contrasting attitudes towards risk remains to be fully researched. But the issue in part may hinge on the responsible authorities articulating the benefits of risk aversion in a language and format that enables all stake-holders to achieve a minimal understanding.

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[149] Of particular relevance is section 30(1) (c) (iii).
[150] This point will be discussed further in the in the section 4.1.2 on positive incentives that are based on existing markets.
[151] This is a common concern with approaches that modify economic behaviour with instruments working through markets and are purely voluntary.
[152] Certain members could *free-ride* on the high environmental performance of more dedicated fellow members.
[153] Ostrom "Institutional analysis" (*supra* note 1).
[154] N Tainton *Veld Management in South Africa* (*supra* note 79).

3.2 Co-management agreements.

The main relevance of co-management agreements to promote private conservation in South Africa is that goals can be set that exceed current regulatory standards for maintaining biodiversity. As opposed to self-regulatory instruments objectives and standards are prescribed by the state and not industry. Mechanisms as avenues utilised to achieve these goals are however generally determined by the regulated entities. For instance cost effective means or methods can be negotiated between private entity and state, towards mutually beneficial ways to achieve these goals.

Agreements between private enterprises and government[155] offer a number of advantages. First, they can facilitate the flow of information between authorities and enterprises that awards benefits to both parties. Second, private resource users are often legally obligated to provide performance indicator information through regular reporting. This can be onerous and costly. But if negotiations are conducted between the state and the regulated community regarding the acceptable measurement of performance, then partnerships between the parties may lessen both the information obligation on the private enterprise through reporting while minimising the monitoring duties the state would have in many cases. Thus agreements may help the state in enforcement and help private enterprises go beyond what they are capable of doing when acting alone. In the language of game theory this is a positive non-zero-sum outcome.

Negotiated agreements also provide the opportunity for a blend of command and control with incentive-based management practices. This is particularly pertinent to environmental policy formation, as this dissertation has argued throughout. In the pursuit of higher levels of conservation, regulation could be expanded to prescribe overall policy goals like base-line targets and timelines to be adhered to that are more demanding on individuals and groups than those in the current standards laid down by law.[156] But the details, such as the best means of achieving the newly set objectives, could be open to negotiation and therefore be, in potential, more cost-effective due to the greater volume of information made available in the negotiation process. This is hypothetical but supported by working precedents in industrial country jurisdictions.[157]

Yet, because these agreements are by design co-regulatory, to be successful certain legislative pre-requisites must be set first. For instance, sites of high-conservation value require priority recognition and organisations suitable for entering agreements[158] need to be identified by state agencies. To make such decisions, the criteria for participation must be established. Thus the minimum terms, standards and reporting requirements for

[155] These advantages are not necessarily confined to environmental matters.
[156] The fact that the objectives of agreements go beyond base-line compliance standards is important because this provides a strengthened incentive for the modification of private behaviour towards this end.
[157] D Bromley *The handbook of environmental economics* (1995) Blackwell, Oxford.
[158] In other words, organisations that are judged suitable to engage in co-regulatory agreements with the government.

private decision-takers entering into agreements have to be set in advance for monitoring the ongoing compliance.[159]

Partnership agreements may be promising mechanisms too for establishing internal codes-of-conduct for membership of sustainable user associations. But it is important to recall here that organisations with voluntary rather than imposed membership and without strict criteria for participation allow ongoing imbalances in the distribution of responsibility for conservation action.[160] No universal design feature for an organisation can be built into it to neutralise this problem, but rather piece-meal adaptations must be devised and applied in a continuing process.

In the establishment of co-operative approaches to private biodiversity conservation, and the necessity of dovetailing conservation with development, positive incentives are arguably more useful than negative ones. Not only are carrots cheaper than sticks but innovation is a more likely outcome of the process. Given that the *partnership* itself provides the impetus for arrangements of this kind there is a lessened need for top-down coercion.

The incentives brought into being include the opportunity for private partners of government to influence the public policy process. If a particular company has an adverse history in government records, or is in an industry more competitive than the average, as well as being in a tightly regulated field, then the partnerships under discussion may provide an opportunity for such companies to improve their reputation with all stakeholders.

Provision for conservation agreements as such exists in a number of other jurisdictions, including the United Kingdom, Australia, Switzerland, Liechtenstein, the Netherlands and the United States.[161] South African legislation currently provides for more than one type of negotiated environmental agreement, discussed below.

3.2.1 Biodiversity Management Agreements (BM agreements)

Section 44 of the Biodiversity Act provides for the establishment of BM agreements between government and responsible organisations or individual persons for the implementation of biodiversity management plans.[162] BM agreements concern either

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[159] A Paterson 'Tax Incentives – valuable tools for biodiversity conservation in South Africa' (2005) (1) *South African Law Journal* at 189 discusses certain procedures to be followed before agreements can be effective.

[160] As mentioned already, certain members can enjoy the incentive rewards from membership but contribute little to achieving the objectives behind the establishment of the agreement with government, or from the formation of the organisation in the first place. The 'long-stop' of penalties like criminal sanctions may be an important factor in preventing such behaviour and promoting participation, but a drawback is that this lengthens the regulatory dimension of any co-regulatory agreement.

[161] Bowles "Incentives for private conservation" (*supra* note 49) at 217-220.

[162] Section 44 provides for the establishment of a biodiversity management agreement in accordance with the provisions of section 43. Such agreements are designed to ensure 'the long-term survival in nature of the species or ecosystem to which the plan relates … (a) and are to be published in the Gazette (43(3))'.

particular ecosystems or particular species. They are generally designed to sustain the long term survival of the subject of the agreement.[163]

The reporting on progress regarding the implementation of the plan must be stipulated and agreed on by the relevant authority beforehand to ensure compliance. This also serves as a safeguard against any benefit accruing to the instigator of the agreement that is not provided for because it is the result of non-conservational activities. The Act provides further that such agreements cannot be in conflict with any plans or agreement already established under other environmental legislation.

BM agreements themselves, or the set of criteria established in order to make them effective, can be useful for earmarking specific activities undertaken on private land judged suitable to qualify for incentive rewards. Once the criteria are identified for establishing the specific value of biodiversity that are required before an agreement can be established, suitable landowners can then be targeted. Also, incentives can be aligned with the content of particular agreements so that private activities, economic and environmental, can be guided accordingly.

3.2.2 Co-operative environmental management agreements (CEMAs)

Chapter 8 of NEMA[164] provides for co-operative environmental management agreements. They can be initiated by the Minister or any MEC to engage in an agreement with any person or community that serves to promote compliance with the national environmental management principles.[165] As certain principles refer specifically to biodiversity, CEMAs are particularly relevant private agent conservation mechanisms. They provide for the undertaking by an individual or community intended to uphold or improve on the conditions laid down by law concerning a particular activity.[166] Therefore they may be important in establishing a range of activities that, if undertaken in the private sector, trigger certain incentives to act in environmentally supportive ways. Minimum standards are laid down for the content and procedures to be followed in concluding these agreements.[167]

The substance of agreements subject to negotiation and ultimately drawn up in regulations are (1) public participation requirements;[168] (2) the agreement's duration;[169] (3) access to information;[170] (4) the reporting procedure;[171] and (5) monitoring.[172] Measurable targets are set and negotiated to be achieved on particular dates,[173] which is a

[163] Section 45 (a).
[164] Section 35
[165] Set out in Chapter 1 of NEMA.
[166] Section 35 (3) (a)
[167] Section 35
[168] Section 45 (1) (a)
[169] Section 45 (1) (b)
[170] Section 45 (1) (c)
[171] Section 45 (1) (d)
[172] Section 45 (1) (e)
[173] Section 35 (3) (c) (i)

safeguard to ensure that non-conservation activities are not taking place as a result of the incentives (if any) being provided. The consequences of non-compliance also need be included in the agreement, including penalties that may be tailored to suit certain situations.

Further, CEMAs should detail incentive goals or make use of existing ones that may be provided for individual persons and communities engaging in such agreements.[174] Depending on the activity that the agreement concerns the set of available incentive devices here is wide in scope. [175]

3.2.3 Mutual assistance agreements

The National Veld and Forest Fire Act 101 of 1998 (the NVFFA) provides for joint agreements between the Minister and any landowner or FPA to provide mutual assistance in fighting fires.[176] An agreement for mutual assistance between FPAs and between an FPA and the government is provided for on land that, in the judgements of their respective members, is in the common interest to conserve.[177]

Individuals or FPAs that support the Minister in providing assistance for the protection of private and state land against fires may be entitled to compensation from the Minister if the agreement in question is established beforehand.[178] Per contra if the degree of compensation for assistance is decided on before the particular agreements are established this could serve as an incentive for private landowners to get into such agreements with the state. For instance, financial incentives could be provided by the Minister to farmers in a given region to take mutual responsibility for fire hazards, whether the surrounding land is privately or state owned. This situation would save government resources in the way of providing personnel, equipment and training to protect state land. This would be so if the incentives given to farmers to join such a scheme are less than the resources to be expended by the state on its own in managing veld-fires on state land.

The NVFFA makes no explicit mention of market-based incentives in the context of mutual assistance. However the protecting of natural landscapes by FPAs against fires is clearly a public benefit and therefore in potential may trigger certain provisions under the Income Tax Act.[179] The latter allow for the provision of positive incentives like tax

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[174] Section 35 (3) (d)
[175] *Environmental Management Co-operation Agreements: A Guide for their Design and Use* (June 2000) Department of Environmental Affairs & Tourism.
[176] Section 19 (1).
[177] Section 19 (2).
[178] Further, Section 19 (3) points out that the payment of compensation for assistance rendered may be necessary in certain cases. This makes the provisions of 19 (1) interesting because in partnerships between the Minister and FPAs, or the Minister and individual landowners, it provides for direct subsidies as compensation.
[179] Section 10 (1) of the Income Tax Act (58 of 1962) allows for the granting of income tax exemptions for income receipts and capital accruals to public benefit organisations, although conservation organisations are not currently classified under this provision. These provisions will be discussed further below.

benefits instead of financial compensation as a consequence of a mutual assistance agreement.[180]

3.3 Mechanisms aimed at achieving sustainable land-use practises/natural resource use.

Given the percentage of private ownership of land at 88 % as mentioned in the introduction, the compelling need for mechanisms that enable private landowners to adopt sustainable land-use practises probably exceeds the opportunities that co-management agreements and conservation organisation formation afford. Private land-owners when motivated to do so often lack resources to conserve communally valued and owned environmental assets like components of biodiversity. New incentives are therefore essential in many cases. Thus policy mechanisms that can be used to identify which landowners should qualify for such incentive provisions are also integral to policies of innovation.
The following mechanisms are informative, first, as capable in principle of fulfilling this conservation function under private ownership. Secondly, they illustrate the available range of useful devices for selection. Third, they show that a number of alternatives exist outside the formation of conservation organisations and co-management agreements.

Yet it is not the purpose of this section to assess the viability and the net merits of *all* of the mechanisms of relevance to biodiversity conservation in an encompassing way. This is not possible in a single dissertation not aiming to deal comprehensively with these mechanisms. These mechanisms are certainly considered relevant but not the dominant theme of the research problem at hand.

3.3.1 Schemes

Clearly most land-owners lack the resources to undertake voluntary measures of conservation unless there are incentives designed to motivate them. However there are numerous avenues that land-owners can freely choose to engage in activities serving to conserve biodiversity depending on the monetary costs to be incurred.

CARA provides for the voluntary contributions of individual land-owners to biodiversity conservation. This can take place through a variety of laid-down procedures. All however are formulated under CARA as *schemes* within which various objectives can be pursued on private land through the actions of the land-owners. These beneficial activities include the construction of soil conservation works,[181] intentional reductions of animal numbers on private land,[182] restoration of damaged natural land[183] and the combating of weed

[180] In practice this would translate into compensation in the form of subsidy or tax benefit for the guarantee of assistance given to the state by FPAs in the case of a veld fires.
[181] Section 8 (1) (a) (i).
[182] Section 8 (1) (a) (iii)
[183] Section 8 (1) (a) (iv).

infestations.[184] Further, the adoption of various schemes may be initiated and encouraged through the provision of subsidies from the state [185] and other avenues for incentive creation.

3.3.2 Biodiversity Management Plans

A number of South African natural resource laws provide for the establishment of management plans.[186] A first observation is that these plans could include provision for the control of factors judged to affect biodiversity. Second, as mentioned above these plans are useful for identifying particular conservation activities undertaken outside of protected areas that should respond to the deployment of incentive provisions.

Biodiversity management plans (BMPs) are described here as one example of provisions that can be incorporated into management plans. Any person or organisation[187] wishing to make a contribution in money or ameliorative action to biodiversity management can submit a BMP to the Minister for approval.[188] The BMP must be designed to secure the survival in nature of a particular species or even an ecosystem in perpetuity.[189] The BMP must also be consistent with the national biodiversity framework as well as any applicable bioregional plan.[190]

The Minister is required to review all such plans on a five year basis to assess compliance and, if deemed necessary, the BMP is amended.[191] This measure ensures that any benefit accruing to the person or organisation for initiating the plan is not being awarded to activities non-conservational in nature. The Minister identifies and assigns responsibility to the designated person or organisation to implement the plan.[192] In addition a Biodiversity Management Agreement may also be stipulated for this purpose.[193]

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[184] Section 8 (1) (a) (vi).
[185] Section 8 (1) states that assistance for such activities can be granted out of 'the moneys appropriated by Parliament'.
[186] These include the Biodiversity Act, the MPRDA, the NWA, the NHRA (in terms of the management and exploitation of cultural resources, like national heritage sites that are used for commercial benefit) and the NVFFA (if the land-owner concerned is a member of an FPA).
[187] Organs of state can also submit proposals for viable BMPs, but this is not directly relevant to private sector conservation.
[188] The plan must relate to ecosystems listed in accordance with section 51 and if not listed then warranting special attention (43 (1) (a)), or species listed in terms of section 55 or if not listed then again warranting special attention (43 (1) (b)).
[189] Listed in terms of section 51. Or, if the ecosystem is not listed but does warrant special conservation attention in terms of section 43(1) (a) or the species is listed in terms of section 55 or is not listed but which does warrant special conservation attention in terms of section 43 (1) (b).
[190] Section 45.
[191] Section 46.
[192] Section 43 (2).
[193] Section 44, see 'BM agreements' *supra*.

3.3.3 Conservation Servitudes

Servitudes are generally referred to in connection with protected area regimes and will not be discussed extensively here. In this protected area context, land-owners whose properties have high biodiversity values are targeted by a particular government conservation department. Such an organisation will enter an agreement with a land-owner regarding future land-use. Although the land-owner retains ownership they undertake to adhere to certain conservation conditions laid out in the agreement.[194] The agreement often takes the form of a deed of servitude which is registered against the title deed of the property.[195] It is binding on successive owners and therefore potentially protects the biodiversity status of the piece of land indefinitely.

In principle servitudes could be extended for conservation purposes in natural resource sectors other than land. For instance servitudes exist in water management because property ownership does not equate with rights to use water resources. Consequently water access may cross over property boundaries.[196] Agreements may be devised whereby water sources on a property in particularly abundant amounts[197] are earmarked for certain uses only, regardless of where the water ends up being used.[198]

The NWA provides for servitudes to work towards achieving public benefits.[199] Although this scenario is currently an abstract possibility, if biodiversity is perceived to be fully a public good then water servitudes may turn out to be useful tools to pursue conservation objectives in such a climate of ideas. Yet evaluations of servitude utility can be made only in practical contexts.

3.3.4 Donations[200]

Many organisations established for private conservation purposes experience severe funding crises from time to time. Part of the reason is that donations account for a significant proportion of the resources necessary to operate such organisations. [201] But donated funds can operate both as incentives to environmental action and as enabling mechanisms to deal with the problem of conservation as a whole. For instance, in

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[194] These may entail, for example, protecting certain aspects of the biodiversity status of the property.
[195] Paterson "Biodiversity incentives" (supra note 142) at 182.
[196] Because water is legally in the public trust, rights to property do not automatically equate with rights to use water resources on that property. Therefore water may need to be lead from one property through to another for its legitimate use.
[197] This presumes there is a likelihood that rights to water on the property on which it exists may be granted to surrounding properties, but only if the surrounding properties acquire the relevant licences.
[198] For instance, sustainable land-use practice that serves concurrently to conserve biodiversity status on the property where the water works relating to the servitude exist.
[199] Section 131 (i) of the NWA provides that the High Court can take into account 'public interest served by the water work relating to the servitude' when determining compensation payable for the granting of servitudes.
[200] Note that donations could be analysed as *incentives* rather than mechanisms in the context of co-opting support for conservation organisations, the concern of the following section. The position taken here is that donations have a dual function, so they can operate both as mechanisms and incentives.
[201] Paterson "Biodiversity incentives" (*supra* note 142) at 191.

donating money to an environmental cause an individual identifies or aligns with that specific environmental concern. Donations matched by information dissemination bring to the fore concerns that warrant private attention and ameliorative action.[202] Alternatively, donor funds can generate resources for directly creating positive environmental incentives by monetary rewards in different contexts.[203]

Thus one common and prominent use of private funds is for specific environmental causes.[204] Creating the incentive for individuals to donate money could be fostered by encouraging the association of individuals and groups with specific sites, species or ecological considerations like the survival of remnant plant species.[205]
To co-opt public support at a micro level, badges, gadgets, newsletters, certificates and travel services can reinforce the identification of individuals with the environmental causes to which they donate their money. These are established institutions and procedures in industrial countries, for instance the emergence and growth of the Sierra Club in the United States, founded in 1892 with a current membership of 1.3 million.

A related but larger scale mechanism is that of identifying organisations such as natural resource user associations who supply products to the marketplace that promote a specific environmental cause through labelling.[206]

The Income Tax Act[207] provides for a number of tax incentives concerning donations made to certain conservation areas and organisations. For instance, donations made to organisations administering trans-frontier conservation areas are tax deductible,[208] although there is significant scope to raise the tax deductible limit on donations and widen this provision to apply to other conservation areas. The donations tax generally levied on donations of cash or property to organisations who qualify are also exempted in specified situations.[209]

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[202] Therefore it is also a means to identify which types of private action warrant reward and where incentives to act are most suitably implemented.
[203] For instance, donated money can be used to subsidise membership of farmers joining agricultural management schemes or sustainable user associations.
[204] For example, a sponsorship scheme exists for the rehabilitation of the Chacma baboon population in the Western Cape.
[205] Voluntary *Friends* groups in the Cape Peninsula, like the Friends of Newlands Forest or Friends of Rondebosch Common are illustrative cases.
[206] A local example can be the case of bio-prospecting in the Northern Cape. Rooibos tea farmers can associate themselves with the preservation of indigenous knowledge and other associated community-based objectives through eco-labelling which identifies them with a particular organisation. In return for membership they need to demonstrate that they are engaging in only sustainable agricultural practices.
[207] Income Tax Act (58 of 1962).
[208] The utility of tax incentives as outlined in the literature will be discussed in later sections.
[209] Section 56 (1) (h) read with section 10 (1) (cN). These provisions are mentioned here fleetingly to illustrate that in terms of their feasibility, donations to conserve private sector conservation have a statutory context within which they need to be considered.

4. INCENTIVES TO CONSERVE BIODIVERSITY OUTSIDE OF PROTECTED AREAS

4.1. Economic incentives

Economic instruments to reward or punish behaviour are recognised on an international level as effective in the management of natural resources with significant environmental dimensions such as forestry, fisheries, land conservation, water quality and river flows.[210] Private land in general and agricultural land in particular supply a large volume and wide range of ecosystem services:[211] such as mitigating or preventing soil erosion; sequestering carbon; and, of particular importance to this paper, harbouring biodiversity. Yet owners seldom receive an explicit reward for making such contributions to conservation. One reason now widely acknowledged is that environmental goods and services are not exchanged in the marketplace because they are not easily divided up and the information about their valuation is not readily converted into price form. [212]

This failure of virtually all markets to value these goods and services with acceptable accuracy is a major concern for efficient allocation.[213] It means that there is no way of tracking whether these goods and services are being suitably managed in both the public and private sectors.[214] In this context the biodiversity problem emerges as an *externality* or external effect outside the price system used by decision-takers. [215] Few obvious incentives exist for farmers as private agents to conserve land in order to sustain the availability of such un-priced services in perpetuity. These have to be intentionally implemented by the state. [216] It follows that incentive devices are a means through which to reward the provision of ecosystems services that have no market valuation.

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[210] R Stavins "environmental economics" (*supra* note 25) at 9-10 as well as L Milne, K Deketelaere, L Kreiser & H Ashiabor *Critical Issues in Environmental Taxation* (2003) at 27-51.

[211] 'Ecosystems services' refers to environmental and natural resource services. According to N Sanchirico and J Siikamaki 'Natural Resource Economics and Policy in the 21st Century' (2007) 165 *Resources: Putting a Value on Nature's Services* at 8, as valued products these services encompass the full range of benefits that individuals and populations obtain from various ecosystems, including, for example, provision of food, water, timber, and fibre; regulation of climate, floods, and water quality; and provision of recreational and aesthetic amenities.

[212] N Sanchirico and P Mumby 'Economics, Habitats, and Biological Populations: finding the right value' (2007) 165 *Resources: Putting a Value on Nature's Services* at 11.

[213] J Van Den Bergh (ed) *A Handbook of Environmental and Natural Resource Economics* (2002) Edward Elgar Publishers; and A Markandya, P Harou, L Giovanni Bellu, V Cistulli *Environmental Economics for Sustainable Development: A Handbook for Practitioners* (2002) Edward Elgar Publishers.

[214] K Arrow et al 'Economic growth, carrying capacity, and the environment' (1995) 268 *Science* at 521.

[215] For the purpose of the present discussion, the textbook definition of an externality is adequate. There are two components. It is an effect on others which is not properly accounted for by the decision maker and, secondly, as a consequence it does not appear in the price system as a cost or benefit.

[216] However, some of the mechanisms and incentives discussed below deal with factors relevant to biodiversity degradation that *have* been assigned approximate market values by policy makers, like water (tradable water rights) and minerals (performance bonds). According to P G W Henderson 'Fiscal Incentives for Environmental Protection- Introduction' (1994) *South African Journal of Environmental Law and Policy* vol 1 at 49, fiscal incentives should be implemented in South Africa to cure market-failure brought about by social costs that cannot be internalized by the individual making decisions.

Internationally, an increasingly widespread approach towards sustaining the provision of ecosystems services is to provide subsidies for land owners, users, resource managers and management organisations for services which they are held responsible to sustain. Projects where ecosystem services are paid for, based on their quantity or quality or both, [217] have been established in a number of countries around the globe and are operational at a variety of geographic scales.[218] For instance, the World Bank has piloted watershed-level initiatives in several countries.[219] But a problem that will be elaborated below is that direct subsidies provided for such ecosystems services is not an exchange relationship that is necessarily sustainable into the future.[220]

Payments directly to producers for ecosystems services, or the use of positive instruments to track them, presuppose prices that express relative values despite the absence of a market. Special valuation techniques and refined data are required, so it is a process that has yet to be applied widely in South Africa. Although economic incentives can be put in place via taxes and subsidies designed for the purpose,[221] other fiscal avenues need to be explored as well. [222]

Monetary payments or equivalent economic incentives like tax expenditures, or foregone tax revenues, need to be proportioned accurately: (1) to the amount of services supplied; (2) to the degree of impact that for-profit land-use is having on ecosystems services; and (3) to the severity of restriction needing to be imposed on private land owners' actions. These are severe identification and estimation problems not unique to South Africa. Devising a rational system of pricing environmental goods and bads remains a world-wide challenge to the use of economic instruments for conservation. To be rational such relative prices have to reflect *opportunity costs*, that is, the cost of doing X with a unit of resources in terms of the cost of not doing Y with them. The latter are foregone benefits which are the true cost in human welfare of spending on X.

4.1.1 Incentives that create markets

Tradable use rights and discharge rights granted to individuals and organisations are possible means for curing market failure. The premise underpinning their use is that markets in general provide the most efficient means of allocating scarce resources. Incentives newly created are intended to take account of the unseen environmental costs

[217] These projects are often referred to in international discussion as 'Payment-for-ecosystems-services programs' or PES projects.
[218] For instance, emerging markets for carbon sequestration credits constitute an evolving international development, whereas national forest conservation projects are operational in a sub-set of countries like Australia, Costa Rica and Mexico. See F Alpizar, A Blackman and A Pfaff 'Payments for Ecosystems Services- Why Precision and Targeting Matter' (2007) 165 *Resources: Putting a Value on Nature's Services*, 22.
[219] N Sanchirico and J Siikamaki 'Natural resource economics and policy in the 21st Century' (2007) 165 *Resources: Putting a Value on Nature's Services* at 19.
[220] This is clearly the case unless some form of concrete environmental return is secured in perpetuity.
[221] P G W Henderson 'Fiscal Incentives for Environmental Protection- Conceptual Framework' (1995) *South African Journal of Environmental Law and Policy* vol 1 at 55.
[222] Paterson "Property tax" (supra note 55) explores the utility of property tax incentives under protected area designation.

or externalities associated with certain activities.[223] To this end, governments prescribe thresholds for sustainable use of natural resources and the maximum rate of exploitation allowed for a unit of the resource in question.

This is not an easy task because 'carrying capacities in nature are not fixed, static or simple relations…they are contingent on technology, preferences and the structure of production and consumption [and] the ever changing state of interactions between the physical and biotic environment.'[224] By design, allocations of exploitation rights are then made in accordance with these thresholds. It follows that trading schemes need to be fostered to harbour the exchange of these allocations.

In South Africa, as elsewhere, licences are often stipulated to obtain access or use of natural resources. They are further required by individuals or companies to conduct activities that pollute, develop or impact on a natural landscape, as well as being transferable, and so provide for the possibility of trading. Yet no markets currently exist within which to trade such authorisations in South Africa, which means that substantial planning and cost involved in creating them lie ahead.

Theoretically a tradable licence system would increase environmental efficiency in that resource users would be motivated by economic gain to lower their consumption and polluters to reduce their output. [225] Both consequences would provide benefits for sustaining biodiversity.

Such a system by design is intended to maximise the economic efficiency of natural resource use in that a conferred right would end up being used in the most efficient manner. Various forms of tradable licenses are available here all of which have specific relevance to private sector biodiversity conservation, depending on the sector for which the licence is granted. Of these only fisheries rights in an allocation scheme are currently being implemented here. The restricted ambit of this paper precludes discussing the relevance of tradable permits to private biodiversity conservation in each sector in which they might occur. But the water resource sector is chosen for analysis of tradable water entitlements as an illustration of what is possible.

However, for tradable licenses to be effective tools for biodiversity conservation, thresholds must be set for the sustainable use of resources.[226] This was evidenced clearly

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[223] T Tietenberg 'Tradeable Permits in Principle and Practise' (2003) Unpublished paper prepared for presentation at "Twenty Years of Market-Based Instruments for Environmental Protection: Has the Promise been Realised?" Donald Bren School of Environmental Science and Management (University of California), August 23-24.

[224] Arrow "Economic growth and carrying capacity" (*supra* note 214) at 521.

[225] The incentive is that authorizations obtained by individuals can be freely traded for profit if not used. For example, once the market for tradable rights has been created, the theory is that to stay competitive traders will strive continually to improve and innovate techniques of production that minimize the use of a particular resource. If successful they would potentially have more to trade on the market, or for the same amount of resources used have more output. If this prediction is correct it means that the boundary reflecting cost-efficiency is constantly expanding.

[226] And conversely, the pollution levels stipulated in transferable authorisations need to be set within the schemes they are intended to be traded.

in the case of the South African fishing industry.[227] Thus far thresholds set for rights allocation purposes have been shown to be highly complex in design as well as costly to implement given the range of environmental and socio-economic considerations to be taken into account in initial rights allocation.[228] In addition initial implementation of tradable licence schemes has been extremely costly to implement in other jurisdictions.[229] In general, South African experience mimics that described for other developing countries in the international literature.

A range of planning initiatives to determine trading thresholds in South Africa are currently in progress for a number of sectors.[230] Yet the complex blend of objectives to be taken into account in natural resource rights allocation in South Africa may inhibit any blanket implementation across all or most of the sectors relevant to private interest biodiversity conservation.

Environmental sectors in South Africa subject to provision for the trading of rights include biological resources[231]; conduct of fisheries[232]; forestry exploitation and regeneration[233]; mining[234]; and rights to water use.[235] The scope of this dissertation precludes a comprehensive analysis of all provisions within these sectors. One exception is transferable water quotas discussed here as an *illustration* of the array of opportunities as well as the constraints that condition the use of incentive devices to create markets.

4.1.1.1 Transferable water quotas and use-rights

The NWA abolishes the private-public water divide, so that the power to allocate the authorisations of use and access to water is held by government. In legal perspective water resources are held in the public trust,[236] a feature which makes this concentration of authority possible. Private water rights held prior to the NWA coming into force were therefore relinquished to the state. Beyond the five existing lawful uses of water under

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[227] Section 14 of the MLRA provides for the annual establishment of total allowable catch (TAC) and total applied effort (TAE) in order to inform the rights allocation process.
[228] See Foodcorp (Pty) v DDG, Department of Environmental Affairs and Tourism: Branch Marine and Coastal Management 2006 (2) SA 191 (SCA) as well as Bato Star Fishing (Pty) Ltd v Minister Environmental Affairs & Others 2004 (4) 490 (CC).
[229] James "Australian incentives" (*supra* note 37) at 65.
[230] These include, in the context of biological resources, the National Biodiversity Framework for South Africa (published for comment in GN 801 Government Gazette 30027 dated 29 June 2007); read together with the: National Biodiversity Spatial Assessment (M Driver et al National Spatial Biodiversity Assessment 2004: Priorities for biodiversity conservation in South Africa, *Strelitzia* 17, South African National Biodiversity Institute); National Biodiversity Strategy and Action Plan (www.environment.gov.za/). For understanding the context of transferable discharge permits see the National Waste Management Strategy (section 7).
[231] Section 97 (1) (f) (xiv) of the Biodiversity Act provides for the transferability of licences to use biological resources.
[232] Section 21 (1) of the MLRA provides for transferable commercial fishing rights.
[233] Section 24 (4 (a) is the relevant provision of the National Forest Act (84 of 1998).
[234] Section 11 (1) states that both prospecting and mining rights are transferable under the MPRDA.
[235] Section 51 of the NWA provides for transferring of water use rights.
[236] The state is appointed as public trustee of water resources.

Sections 32 and 33, and the permissible water uses under Section 22[237], land-users have to apply for permission to use a proportion of the water reserve in the managed catchment area within which they own land. Viewed in this way, the right to land or 'land rights' no longer equates with rights to access the water resources on that land.

Thus, in both theory and practice water can be traded in the marketplace as a separate commodity to land.[238] Examples of the determining variables that could affect water's market-place value would be its quality constituents like salinity, security of supply in perpetuity, access location, and the scarcity as well as necessity of water to land use practices in a specific region or habitat. It follows that the value of certain pieces of land may decline significantly because of water rights being severed from property rights. But the legislated allowance for tradable water rights that could come into being might have the opposite effect of a rise in the price of the land in question. The net effect on the valuation cannot be predicted *a priori,* especially considering trading in this commodity is a new practice in South Africa.

Certain units of land are particularly valuable because of the water supply on or beneath them. Thus the sale of permanent water use authorisations on such land to parties other than the land-owner would probably result in a decline in the separate value of the land. Individual land-owners may stand to lose capital value or face generally more adverse financial conditions, like borrowing costs, because of this innovation in rights separation.

The framework of stipulation and facilitation which define a system of tradable water quotas that is potentially efficient is already in place on the national level under the National Water Resource Strategy and the National Water Resource Management Strategy. [239] But to date there is not yet any explicit reference to trading. Additionally, planning frameworks will be established for every significant catchment area[240] and water resource[241] in South Africa.

Incentive levers are likely to be used to regulate environmental security with the potential sale of water authorisations. For instance, it could be stipulated that issued water authorisations may be bought and sold for use only in specific activities or types of agricultural practices[242] and not for others. This will depend though on the progress of environmental research at the micro scale on diverse land uses. But in general, private initiatives for biodiversity conservation could readily fit into the design of such a system.

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[237] This refers to the NWA.
[238] Although not stated expressly, section 25 of the NWA provides for this possibility.
[239] *National Water Resource Management Strategy* (GN 65 in GG 27199 dated 28 January 2005).
[240] Section 8 of the NWA provides for the establishment of management strategies for catchment management areas. Section 9 (b) provides further that strategies must include '… objectives, plans, guidelines and procedures of the catchment management agency for the protection, use, development, conservation, management and control of water resource and control of water resources ….' within each catchment area.
[241] Presumably this would provide thresholds for the sustainable use of each significant water source when trading is taking place. Section 14 provides for the Minister to determine resource quality objectives.
[242] The intention is that, at a minimum, only sustainable practices can be supported through the trading of water authorizations.

The conditions for trading access permits can be stipulated broadly on the water catchment scale, that is, by taking account of landscape features. These conditions are based on the classification of the water resources[243] occurring within the catchment basin. Environmental considerations may be established on the micro-scale of individual sources within catchment areas, depending on the sophistication of management. For example, concerns like maintenance of river flow, control of salinity and preservation of wetlands may be established for each river through the water quality objectives the Minister lays down.[244]

Certain proportions of the water reserve in a catchment area are granted to legitimate users. These individuals or companies can then trade with one another until the water quantity allocated by the authority is exhausted. The rate of return from production processes using the water as an input would determine which land-users end up in possession of the authorisation.[245] In economic jargon, this highest rate of return is the 'highest marginal revenue product',[246] or the highest price generated for the last unit sold in the stream of water units traded between interested bidders.

Hypothetically, this instrument could contribute to long-term self-regulation of the water reserve because both buyers and sellers are afforded opportunities to benefit from the creation of this market. Of key relevance to biodiversity conservation is the fact that an individual who has been granted a water-use authorisation, or who is engaging in one of the five lawful water uses,[247] has a positive incentive to minimise the proportion of their allocated quota of water which they use. This is so because the next best use is sale of the water they are entitled to but do not use to the highest bidder in the market. The buyer stands to benefit because if their land-use activities require more water than they have been allocated out of the reserve, or they are able to use it more profitably per unit, there may be no way of accessing the additional water needed except on the market.

4.1.1.2 Weaknesses of tradable water licences

It needs noting that this general approach may clash with the equity imperatives of resource use in South African environmental management. Completely free trade in water authorisations, which in theory would be the most economically efficient approach, is unlikely to be politically acceptable if concentrated ownership or monopoly power in the market for water rights is condoned by legislation aiming at conservation.

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[243] For each water resource that is considered *significant* in accordance with the classification system, resource quality objectives are determined by the Minister. This system lacks clarity. Although the classification system is designed on a national level, the threshold for the determination of significance may not be clear or traceable across different ecological contexts. For instance, what constitutes *significance* in a water resource in one region may not be so in another one, and vice versa.

[244] These would be accordance with section 13 of the NWA.

[245] In other words, the land-users who generate the most income from the water right are likely to be the ones ending up using it as they would be most likely to pay the highest price for it.

[246] James "Australian incentives" (*supra* note 37) at 54.

[247] Namely, Section 22(1)(a)(i) to (iii) and (b) and (c).

This is especially so considering that socio-economic and transformation concerns are explicitly mentioned concerning the obligations that govern the issue of authorisations under the NWA by the relevant authority. [248] The reference to redistribution of access extends to the actions of catchment management authorities in facilitating the issue and exchange of water rights within a market.

It would be problematic if water authorisations were granted but remained unused, or were hoarded by the rights holder until a market demand for the entitlement emerged.[249] This possible outcome parallels the option of acquiring a retention permit under the Mineral and Petroleum Resources Development Act (the MPRDA). But it is not similar in its effects to the activation of multiple retention permits for mining all at the same time because of newly favourable market conditions.[250] In contrast, if a number of retained water authorisations are triggered into use simultaneously, this could exert unforeseen[251] stress on the water reserve if thresholds for sustainable use had not been established beforehand.

A key concern in relying on tradable water rights to achieve specific environmental objectives is the time they take to implement in practice. Markets for tradable use rights can take a long time to develop. This has been observed in the implementation of markets for such rights in other jurisdictions.[252] In fact certain commentators believe that an efficient market is unlikely ever to develop given the relatively small size of South Africa's industrial and commercial sectors.[253]

A related concern is that once resources are invested in implementing the system, there is no assurance that the actual environmental objectives planned would be achieved through the targeted shifts in economic behaviour. Keeping in mind that tradable resource rights are operational in few other countries at present, it is a serious weakness that the models and performance data against which to estimate their utility in South Africa, are so few in number and so thin.[254]

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[248] Section 27 states that the responsible authority issuing general authorizations must take into account 'the need to redress the results of past racial and gender discrimination' as well as '(b) the socio-economic impact of …the water use or uses if authorized and the (d) (i) socio-economic impact of …the failure to authorise the water use or uses (d) (ii)'. When interpreted in this manner, transformation as an objective needs to be balanced with development goals.

[249] What James "Australian incentives" (*supra* note 37) at 59 refers to as 'sleeper allocations' in the context of tradable discharge permits.

[250] Although bedrock (effectively mineral reserves) is the skeleton underpinning the biodiversity of all living species, the effect that stress on a water reserve would have on biodiversity is likely to be more severe in the immediate conceivable future than would stress on a mineral reserve.

[251] 'Unforeseen' in that such a situation is most unlikely to have been anticipated at the time the authorizations were allocated.

[252] Wilkie "Incentives Canada" (*supra* note 29).

[253] R Stauth and P Baskind "Resource economics" in R F Fuggle & M A Rabie *Environmental management in South Africa* (1992), Juta & Co, Cape Town.

[254] Although speculative, the political and economic context in which tradable authorizations are being implemented is also a relevant consideration. In South Africa, with limited capacity in government to get such a system off the ground, there may be administrative costs that are not outlined in the literature because they are not fully observable in the other jurisdictions already implementing them. This possibility is by its nature difficult to assess.

If the markets for tradable rights remain relatively inactive then the systems will not be effective cost saving instruments in the first place. A low volume market indicates that the average company is choosing not to buy and sell user rights. The prevailing market price may not then reflect accurately the alternative choice, that is, the full cost to companies of modifying production or extraction technology to meet regulation. The incentive for companies to be active and participate in a tradable market would then be weak and participation thin in what may be a low-level equilibrium trap. Devising policy interventions to overcome this deficiency would be a formidable challenge to the state agencies concerned.

4.1.1.3 Extending market creating incentives

The potential for creating trading schemes to regulate development[255] as well as pollution has been provided by land-use[256] and waste management regimes in South Africa.[257] As remarked already, tradable pollution permits are yet to be comprehensively developed in South Africa. Their statutory feasibility is therefore difficult to evaluate here. Indeed only the new air pollution act[258] allows explicitly for the prescription of trading schemes by way of regulation in South Africa. [259]

Tradable pollution permit systems rely on a regulatory base-line or a minimal command-and-control framework of provisions. Government sets a general cap, for example on chemical emissions, and individuals and organisations can then be allocated permits allowing them to release a volume of pollutants equal to proportions of the overall cap that are determined in advance. Depending on which is considered the most cost-effective option, an organisation then has the choice of *either* altering their technology to meet the limits set by the permit, *or* of purchasing additional pollution credits from the market in accordance with how many units over the cap they are releasing.[260] Credits can also be

[255] Tradable development rights work on the same principle as tradable resource user permits, but the former function also as *area regimes* or area specific methods of conservation. Development rights that can be traded are used to protect environmentally valuable areas like wetlands, or other landscapes high in biodiversity. Rights to develop specific areas of this kind are bought and sold in active markets for this purpose. A critical component of this instrument is that rights to develop can be traded only between parties inside the specific zonings or areas for which the development right has been granted. For instance, if a right to develop a residential area is held by one individual, he or she cannot sell this right to a buyer who wishes to use it for commercial development purposes or to a person who wants to develop housing on land zoned as agricultural.

[256] Section 24 E (c) of NEMA provides for the transferability of environmental authorizations.

[257] Waste management licenses will be transferable under section 57 (1) of the *National Environmental Management: Waste Bill*.

[258] National Environmental Management: Air Quality Act (39 of 2004)

[259] Section 53 (i) of the National Environmental Management: Air Quality Act (39 of 2004) provides 'that the Minister may make regulations that are not in conflict with this Act, regarding…trading schemes'.

[260] Companies, or broadly any organisations responsible for polluting, can sell permits they own on the market to others unable to lower their pollution emission enough through technological modification that is cost-effective.

allocated to organisations that voluntarily lower their polluting rate below the prescribed limit.[261]

Section 9 (c) of the Transfer Duty Act provides that transfer duty exemptions may be granted to organisations in respect of *property* they acquire, providing that the property will be used for the public benefit, or the organisations the property is transferred to are listed in section 10 (1) of the Income Tax Act.[262] Although not yet feasible in that a framework for trading has not yet been established, it may be valid to extend to rights trading the reasoning employed in granting transfer duty exemptions. Currently these apply to public benefit organisations in respect of property under laid down conditions. The suggestion here is that they are extended to rights that are transferrable from one organisation to another where the latter use them for conservation purposes, once a facilitating trading framework is in place. For example, water use authorisations that are transferred to an organisation that plans on using them for enhancing biodiversity in a particular place, like a private nature reserve, may have some component of the cost of transfer deducted due to the conservation purpose the right to water ends up serving. [263]

4.1.2 Incentives that use existing markets

This set of incentives, rather than creating new markets through the introduction of specific fiscal devices for this purpose, relies on the existence of already established markets and prevailing market forces.

The following considerations are judged essential for distinguishing between policy levers for the purpose of (i) biodiversity conservation[264]; (ii) environmental impact effectiveness[265]; (iii) technical and administrative issues[266]; (iv) revenue generation[267]; (v)

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[261] To illustrate, say Company A is releasing 250 measured units of pollution into a river system and the prescribed limit for which a permit is obtainable is 200 units of output. Company A invests in R&D to find new technology to lower their pollution output to 150 units, that is, 50 units below the prescribed limit. Company B *per contra* is unable to devise process innovations to lower its pollution output in a cost-effective way. The extra 50 units by which Company A have reduced their output can then be sold on the market. Company B has an option to buy the 50 units of capacity as an owned credit. Yet Company B's decision whether to buy will depend on how much the credits are selling for, the price being traded off against the potential cost Company B would incur if they had to invest in pollution-lowering techniques. Thus if Company B does pay for the extra 50 units of pollution it may emit, then it saves on costs otherwise to be incurred in technological modifications to comply with its permit conditions.

[262] See section 4 below on positive incentives that use already established markets.

[263] Section 56(3)(e) of the NWA ties in with this line of reasoning. It provides that '…on an equitable basis for some elements of the charges to be waived in respect of specific users for a specific period of time.'

[264] This set of criteria is drawn from the prerequisites identified in the *A Framework for Considering Market-based Instruments to Support Environmental Fiscal Reform in South Africa: A Discussion Document* (2003) National Treasury (Tax Policy Chief Directorate) (hereafter referred to as the 'National Treasury Paper') at 55-62.

[265] To be effective the *link* between biodiversity conservation as the objective and the instrument used as the means should be direct and clear.

[266] The instrument should be simple and inexpensive to implement in terms of the administering authority's responsibility, as well as imposing low compliance costs, and it should preclude perverse effects. It has been mentioned more than once above that government at all levels in South Africa has particularly limited

distributional consequences[268]; (vi) net effects on the extent of competition[269]; (vii) legislative aspects[270]; (viii) and public support.[271] These dimensions provide a broad framework within which incentive levers that use existing markets have been assessed here.

4.1.2.1 Positive incentives that use existing markets

The design of positive economic incentives allows for their activation, as possible new courses of action, through market processes or other economic instruments like taxation. In turn these motivate private decisions to act for gain. Thus they operate by moulding and encouraging certain kinds of behaviour in the private sphere.[272] A hypothetical claim about incentive levers that is particularly relevant to this discussion is that when they are put into use in countries with resource constraints, they will achieve desired levels of environmental protection at least cost to society.[273]

Positive incentives are generated by rewarding actions that have environmental consequences beneficial to the broader sectors of society. Thus, if feasible, the creation of such incentives promises to be a valuable tool for steering private economic behaviour towards biodiversity conservation objectives. But their effectiveness, first, in raising revenue for environmental protection and, second, in curing market failure has come under criticism.[274] So the concerns expressed under these two heads must govern successful implementation of the polluter-pays-principle in South Africa, although the substance of the alleged deficiencies is not pursued here for lack of space.[275]

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capacity to administer. Therefore mechanisms and incentives devices that relieve this burden on the state are desirable for that additional reason.

[267] How accrued revenue should be used is a pressing question about taxes. The fact that earmarking revenue for dedicated environmental purposes does not appeal to fiscal authorities is a concern. But a degree of earmarking of accrued revenue to meet administrative costs in implementing an instrument may well be important to its durability as a policy initiative. In using tax benefits to mould the behavior of economic agents towards conservation, revenue is not raised for the state so these concerns are secondary.

[268] Equity is the concern here, in a horizontal interpretation, namely, the uniform impact of the instrument across persons of equal economic standing, and a vertical one, that is, the differential impact of the instrument across different income groups.

[269] Instruments cannot be allowed to undermine the competitiveness of local industry in domestic and international markets.

[270] The implementation of instruments has to be legislatively feasible, which has been shown in this paper not to be problematic in many cases, as well as giving effect to South Africa's commitments under conventions we are party to internationally.

[271] It needs to be established whether public support for implementation of the instrument is likely. In practice this will be reflected in the probable personal benefit perceived in the eye of the individual or enterprise. Public benefits are unlikely to instigate sufficient buy-in.

[272] Inc. (2003) Economic Instruments for Environmental Protection and Conservation: Lessons from Canada. Prepared for the External Advisory Committee on Smart Regulation, Government of Canada. (obtainable on www.pco-bcp.gc.ca/smartreg-regint/en/06/01/su-11.html#exec), accessed 21/11/2007.

[273] Harlan "Policies in the new millennium" (*supra* note 27).

[274] P G W Henderson 'Fiscal Incentives for Environmental Protection- The Way Forward' (1995) *South African Journal of Environmental Law and Policy,* vol 2 151 at 152.

[275] The weaknesses of market-based tools in reducing and remedying negative externalities, like over-exploiting open-access resources and misperceiving pollution damage, will be discussed further below.

A proposition that animates this thesis, already stated and reiterated in different contexts below, is that ecological goods and services not readily priced can be incorporated into decision arenas through the use of incentive devices. But a weakness that endures is uncertainty over the accuracy of methods to quantify these costs. Some researchers have suggested, given the range of prospective environmental crises, including the reduction of biodiversity, that current and future generations in South Africa face, that implementation should nonetheless proceed on the basis of estimations.[276] In other words one should 'ensure that resilience is maintained, even though the limits on the nature and scale of economic activities thus required are necessarily uncertain.'[277] Given the growing status of the precautionary principle in international environmental law, as well as its mention in the bulk of new natural resource legislation in South Africa, this is a position that merits attention. But bearing in mind the potential inefficiency in the allocation of valuable resources that could result, this may be a question best left to the economists, statisticians and accountants to answer.

Subsidies Subsidies may vary in the way they are implemented and the environmental sector in which they are introduced.[278] But in general operation they comprise financial assistance in the form of a grant or preferential tax treatment. It is given by the state to private enterprises in order to promote behaviour that benefits broader society and that is of strategic importance to the economy.[279] Help rendered to meet obligations is contingent on the performance of stipulated actions by private beneficiaries.[280] Biodiversity conservation constitutes an undisputed benefit to society, although its quantification by a multi-variable index and its monetary valuation is both difficult and contentious. So subsidies could be used in principle to promote activities in the private sector that intentionally serve to sustain biodiversity.

Although subsidies can potentially be used to promote sustainability and conserve biodiversity these payments are plagued by two overriding concerns. First, they are claimed not to comply effectively enough with the polluter-pays principle.[281] Secondly, even if they promote sustainability in an activity, they can be perverse in the way they operate if the subsidised activity is environmentally harmful to start off with. For

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[276] Henderson "Fiscal incentives- the way forward" (*supra* note 274) at 153.
[277] Arrow "Economic growth and carrying capacity" (*supra* note 214) at 521.
[278] For an overview

of the sectors suitable for subsidy implementation see: OECD *Subsidy Reform and Sustainable Development: Economic, Environmental and Social Aspects* (2006) OECD Publishing; OECD *Environmentally Harmful Subsidies: Challenges for Reform* (2005) OECD Publishing; OECD *Environmentally Harmful Subsidies: Policy Issues and Challenges* (2003) OECD Publishing; United Nations Environmental Program *Energy Subsidies: Lessons Learned in Assessing their Impact and Designing Policy Reforms* (2003) United Nations Foundation.
[279] N Myers and J Kent *Perverse Subsidies- How Tax Dollars can Undercut the Environment and the Economy* (2001) Island Press, Washington DC at 5.
[280] S E Gaines and R A Westin (eds.) *Taxation for environmental protection: a multinational legal study* (1991), Quorum Books, New York.
[281] *A Framework for Considering Market-Based Instruments to Support Environmental Fiscal Reform in South Africa: A Discussion Document* (2003) National Treasury (Tax Policy Chief Directorate) at 89. This point will be expanded below in the discussion of indirect subsidies or tax benefits.

instance, if given to enterprises engaging in agriculture, mining or forestry activities, the financial assistance provisions of the NWA, if the assistance contributes to the financial viability of the harmful activity, could operate as a perverse incentive.[282]

Section 8 of CARA[283] empowers the minister to establish *schemes* whereby financial assistance 'out of moneys appropriated by Parliament'[284] can be used to subsidise the activities of landowners[285] in furtherance of the objectives of the Act, including conservation-related exercises relevant to biodiversity conservation.[286] Thus the subsidy could have a dual function here when operating within an instituted scheme. Firstly, it could urge farmers to join the scheme, and secondly, it could pay them for services that cannot be rewarded through market creation or other incentive-based conservation mechanisms because they are neither recognised nor valued.

It is arguable that schemes could be designed to further certain objectives of CARA provided that they are conservation based and not aimed at promoting agricultural production.[287] Private land owners could voluntarily join schemes and in doing so commit themselves to furthering the particular objectives of CARA identified by the program. Such schemes though would have to contain criteria that the farmers would be required to fulfil before membership of the program is granted them.

Examples of the characteristics to be considered before membership is granted could be (1) whether the farmer has demonstrated environmental achievements; (2) have implemented an effective environmental management system; and (3) demonstrated continual compliance with the Act. Designed schemes falling within this basic framework could be set up in a way that provides positive incentives[288] like financial grants to land

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[282] Section 61.
[283] Conservation of Agricultural Resources Act 43 of 1983 (CARA).
[284] CARA Section 8(1).
[285] Listed in Section 8(1)(*a*)(i-vii). The most relevant provision is 8(1)(a)(vii), in that it provides for the payment of subsidies in respect of 'the performance…of anything else which improves soil fertility or counteracts the vulnerability of soil to erosion'.
[286] Section 8 (1) (i) to (vii) refer to an extensive list including subsidy for soil conservation works, reductions of domestic animal numbers, land restoration, cultivation of particular crops (these could be indigenous), and the combating of weeds and invasive plants. Section 8 (2) states that different schemes may be established for different areas, and that the schemes may differ between the particular areas for which they are established. Section 9(1) (e) provides further that the Minister may determine requirements that need to be complied with in order for landowners to qualify for assistance under the Act.
[287] Such as the case where a subsidy scheme is to facilitate agricultural development by resource poor farmers, implemented by GN 1036 in Government Gazette 30427 dated 31 October 2007 under the NWA. Such a scheme can be designed to develop sustainable irrigation schemes so that subsistence farmers can provide food for their families and ultimately turn their activities commercial. Although CARA wears two hats when it comes to balancing agricultural development with conservation, this scheme certainly focuses on the former objective and is to that extent less likely to benefit biodiversity in the long-run.
[288] It needs noting here that regulatory incentives could be put in place that operate in the same way. An example of a regulatory incentive would be if, once a land owner becomes a member of a scheme, they become eligible for rewards in meeting regulations. Requirements could be, firstly, flexibility on the permit conditions for certain activities or for modifications that would normally require environmental authorization. Secondly, there would be a reduction in reporting obligations and the relaxing of state monitoring on owner activities. For such mechanisms to be effective, of course, their applicability needs to be assessed on a case-by-case basis.

owners that register as members of the particular program for the region within which they own land.

As a further instance, the state could promote the formation of environmental management plans by specialists and encourage the implementation of these plans by private owners for whose land the plans were designed. If the plans, when put into practice, are likely to entail financial loss to the land-owners, then the state can offset the costs of implementation by subsidising it with a grant. Or the farmers who are implementing the plan could be granted lower taxes on the goods they produce than farmers producing the same goods but without adhering to an environmental management plan. To qualify for such a subsidy or tax benefit the farmers would, firstly, have to have in place at a sub-level an environmental management plan aligned with the objectives of CARA, and secondly, be managing their agricultural resources in a way that is approved by the relevant Conservation Advisory Board.[289]

Subsidies would reward above-average environmental performers, which is their main rationale. The existence of these schemes would also act as an inducement to conform for land-owners who do not fulfil the environmental requirements needed to join the scheme. Non-members would have to increase their performance in environmental preservation in order to qualify for admittance to capitalise on the financial and regulatory benefits available under such schemes.

To join a scheme certain private land-owners can be presumed to require technical assistance in the form of landscape assessments by independent specialists and land management recommendations that follow. The specialist advice about transforming land-use practices towards becoming ecologically sustainable could be highly beneficial to the farmers. For instance, the potential increase in long-term production yields resulting from the implementation of the management recommendations could constitute one example of a reward to the farmer for joining the schemes. Of course this depends on the quality and applicability in practice of the technical advice given.

In theory, schemes could be aligned also with the objectives for which conservation committees are first established.[290] The subsidies available under schemes could then be used to foster co-operative public support in providing incentives to land-owners to join conservation committees. Although the mechanisms for such alignment are explicitly set out in Sections 8 and 9 of CARA, it may be feasible to implement similar proposals under other conservation legislation that has provisions allowing for financial assistance.

As mentioned already, the NWA has financial assistance provisions of relevance because water resources are vital components of a region's biodiversity status. Section 32 (b) of the Biodiversity Act provides further that funds not required immediately for policy use

[289] Section 17 (2) establishes a board that advises the minister on '(b) the desirability of establishing a specified scheme, and the provisions of any scheme; and (c) any other matter arising from the application of this Act or a scheme, or which it may deem necessary in order to achieve the objects of this Act or which the Minister may refer to it for advice.'
[290] See section 3 of this dissertation.

by the Minister can be channelled into any venture seen as fit by state officials. As agriculture constitutes the biggest threat to biodiversity in this country, a scheme like the one outlined above for water permits could be a feasible option for the investment of such funds. However, in practice the government's reluctance to support such policy avenues through direct subsidy is predictable as they fall on the expenditure side of the fiscal equation and once used for an unbudgeted purpose cannot readily be reclaimed for their original planned use.

One important further consideration is that where grants or other forms of direct financial compensation supply the initial impetus for schemes to become operational, the process will not become sustainable unless institutions are in place to drive its operation in perpetuity. For instance, annual budget allocations are subject to political and economic vagaries in the short-term, so conservation expenditure has to compete periodically with many other demands on state resources. But if a fund devoted to environmental purposes is set up with legal safe-guards against other uses, known as ring fencing, there can be greater continuity and certainty in policy actions over time.

Tax benefits Tax benefits operate in much the same way as subsidies but they do not reward environmental performance directly with grants. Instead they operate by providing organisations and individuals with benefits in different forms of taxation reduced or foregone depending on the particular environmental outcome that is desired and the type of expense or donation being taxed. A prerequisite for making tax benefits effective tools for conservation is that the objectives they are designed to achieve must be first and foremost environmental protection.[291] Judging from recent policy documents, this has not necessarily been the case.[292]

In South Africa the enabling legislation in this regard is the Income Tax Act.[293] Several other policy documents have pointed out the role fiscal incentives can play in environmental protection,[294] the most important of these being the Draft Policy Paper for the National Treasury.[295] Paterson[296] has conducted in-depth analysis of the tax framework[297] in its relation to environmental protection, in particular, which tax incentives exist that allow tax payers to support sustainable development initiatives. Numerous provisions can be interpreted as potential tax benefits for biodiversity

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[291] As opposed to income generation for instance.
[292] *A Framework for Considering Market-Based Instruments to Support Environmental Fiscal Reform in South Africa- Draft Policy Paper* (2006) National Treasury (Tax Policy Chief Directorate) at 39.
[293] Income Tax Act (58 of 1962).
[294] See M Katz, D Davis, J De V Graaf, P Du Toit, P Mohr, D Mokhatle and J Njeke *Interim Report of the Commission of Inquiry into Certain Aspects of the Tax Structure of South Africa* (1994) at 88; *Market-Based Instruments to Support Environmental Fiscal Reform in South Africa: A Discussion Document* (2003) National Treasury.
[295] National Treasury Paper (*supra* note 264).
[296] A Paterson and T Winstanley 'Improving the legislative approach to Biodiversity Conservation and Sustainable Management of Natural Resources in South Africa' (2003), *EnAct International*.
[297] Legislation comprising this framework includes the Income Tax Act (58 of 1962), the Local Government: Municipal Property Rates Act (6 of 2004), the Transfer Duty Act (40 of 1949) and the Estate Duty Act (45 of 1955).

conservation. Although they are relevant to this research, space limitations make a comprehensive overview of Paterson's research here difficult.

As is to be expected, tax benefits can be used in many spheres of private sector biodiversity conservation to streamline the implementation of a number of the mechanisms discussed above. Of particular relevance here are the tax provisions likely to have the biggest impact in motivating the formation and activities of sustainable user organisations. Particularly relevant provisions in this regard include income tax[298], property tax[299], estate duty[300] and transfer duty.[301]

Unfortunately tax benefits suffer from two inherent problems mentioned above with regard to subsidies. Namely, they contravene the polluter-pays principle, and secondly, they can be perverse in effect.

Firstly, to be consonant with the polluter-pays (or 'user-pays') principle,[302] positive financial incentives for industries or resource users to lower their environmental impact cannot be subsidies or tax expenditures borne by other tax-payers. The latter are not the polluters. To be effective the costs otherwise imposed on the broader community must be *internalised* by the polluters regardless of whether they are investing resources in conservation technology or not. This requires that tax benefits to polluting users in a specific sector need to derive from activities in *that* sector to which the incentive is directed so as to achieve behaviour change. However in practice this principle is likely to prove elusive to implement here given the wide array of conservation opportunities that tax benefits afford.[303]

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[298] Section 10 (1) (cN) of the Income Tax Act provides for the granting of income tax exemptions for receipts and accruals to public benefit organisations such as sustainable user organisations fostering biodiversity in a particular region. Section 10 (1) (cA) provides further that income tax exemptions can be granted to institutions conducting scientific or technical research as well as others that provide valuable services to the government. In theory private organisations adopting voluntary conservation initiatives fit well into this category, but they do not qualify as *public benefit organisations*. A further limitation of these provisions is that the conservation activities of the mining sector are income tax deductible. If it serves to make mining financially sustainable this incentive is perverse in the mining context, but could effectively be extended to other purely conservation based activities like biodiversity restoration. Links with other mechanisms can be established through section 18 (A) (1) in that it provides for donations made to organisations exempt under section 10 to be subject to income tax deductions.

[299] As mentioned in section 2 of this thesis in relation to Paterson's research ('property tax for protected areas'), section 8 (2) read with 15 (2) of the Local Government: Municipal Property Rates Act (6 of 2004), property tax benefits should be granted to private land-owners who choose to initiate the designation process of making their land protected.

[300] According to section 4 (h) of the Estate Duty Act, estate duty deductions may be granted for the same range of organisations listed under section 10 of the Income Tax Act.

[301] Section 9 (c) of the Transfer Duty Act provides that transfer duty exemptions may be granted to organisations in respect of property they acquire providing that the property will be used for the public benefit or the organisations that the property is transferred to are listed in terms of section 10 (1) of the Income Tax Act. This could be a particularly effective tool in protected area transfers, if the public benefit organisation is planning on preserving land transferred for biodiversity purposes. This is for the public benefit and therefore eligible.

[302] Principle 16 of the Rio Declaration is on internalization of environmental costs; thus it reflects the polluter-pays-principle.

[303] Administrative complexity is consequently an additional consideration.

Secondly, by way of illustration, paragraph 12 of Schedule 1 to the Income Tax Act has provisions that relate to the deduction – from taxable income - of expenditure that a farmer incurs, for example, while eradicating noxious plants. Likewise Section 17A refers to compensation regarding expenditures incurred in preventing or repairing soil erosion. Provided that the soil-erosion works are approved under section 40 of CARA, expenditures incurred by farmers in combating soil erosion may benefit from tax incentives in accordance with the Income Tax Act. The amount of income tax that the taxpayer investing in soil erosion works is required to pay can theoretically be reduced to zero.[304] However if these provisions are used to make agricultural activities financially viable they are operating in a perverse way because agriculture, regardless of whether it is sustainable or not, tends to be a threat to biodiversity.

General weaknesses of positive incentives If there was a consistent method of pricing environmental externalities then the role that fiscal incentives could play in environmental protection would be much clearer. Much disagreement continues over the methods needed to do this. The precautionary principle pushes towards calculating externalities on the high side in order to cater for unforeseen considerations negative in effect. But it needs to be kept in mind that the principal function of fiscal tools like taxes and subsidies is to modify individual behaviour in pursuit of utility maximisation. If perceived as arbitrary and excessive by payers, the taxes levied on some resource users and polluters may create hostility in the individuals liable for the tax.[305] All tax systems rely on voluntary compliance by the greater majority of assessed recipients of income or wealth accrual, so any increase in tax evasion is highly undesirable to fiscal authorities.

Fiscal incentives applied for environmental protection presupposes the obligation resting on governments to intervene actively in the environment.[306] But such intervention is held by certain thinkers like libertarians to conflict with the idea of a free-market economy and its presumed efficiency in allocating resources. This is controversial but potentially important as a broadly competitive market base provides the impetus and the rationale for the implementation of other mechanisms that create markets in order to function efficiently, like the tradable water authorisations previously discussed.

Of direct relevance also are the equity concerns contained in much of South Africa's natural resource legislation. These demonstrate that the principle of maintaining a free market economy for efficient allocation is not absolute. Certain considerations like social justice and state intervention to protect the environment can and do justify the breach of this freedom of action in free markets principle. But this is not to say that there is no room for robust disagreement in the analysis and policy implications of both the principle and deliberate breaches of it.

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[304] A realistic example is where a mining company buys a piece of land upon which they hope to obtain the right to mine. They are granted the right and then mine the land. After mining activities have ceased, the company rehabilitates the land and a closure certificate is issued. If instead of selling off the piece of land the mining company may decide to keep the land and rent it out for agricultural land-use. From that time on if the mining company spends on soil erosion works it can claim the deduction against its taxable income.
[305] Henderson "Fiscal incentives - the way forward" (*supra* note 274) at 151.
[306] Henderson "Fiscal Incentives – introduction" (*supra* note 219) at 49.

The Margo Commission[307] stated that it is desirable that incentive devices involving costs granted in one sphere of production be paid for elsewhere in the economy as a whole. To illustrate, if one farmer is given a property tax break for submitting his/her land for declaration as a protected area, then the revenue lost by the state in providing this incentive could be made up by charging higher user charges for water in the region. In such instances tax incentives are not useful for internalising environmental costs.

Creating positive incentives is the aim of tax expenditures, like tax holidays or exemptions.[308] Therefore some proportion of the cost of their implementation must be borne by the broader tax-paying community. As remarked above, the obligation on the polluter to pay is in conflict here with the use of positive incentives to protect the environment. Considering that the common goal of these approaches that potentially work against each other is biodiversity protection, some utility-maximising balance has to be struck between efficiency, equity and environmental integrity.

4.1.2.2 Disincentives

The incentive devices discussed below are considered negative in that they discourage by penalising non-compliance with standards or objectives set by regulation. Failure to meet established objectives has a destructive impact on biodiversity in many cases. So the vehicle used to minimise damaging activities is the imposition of costs on the perpetrator.

With a major proportion of natural resources in South Africa shifted into public trusteeship the private-public ownership divide has disappeared in many sectors. In other words, the environmental dimensions of natural resources are deemed to be in the public trust, so private enterprises have to apply to the government for rights to use and access a particular resource. Once user rights are granted to a private entity, the activity of exploitation is deemed to take place in the private sphere. Even though the resource use is in principle happening under strict state regulation, there is still a need for safeguarding mechanisms to be in place to ensure that *all* negative externalities are internalised by the rights-holder. Policy approaches to this end translate in many cases into the establishment of disincentives or avoidance devices.[309]

Regulations have the capacity to modify the legal framework applicable to private resource-using organisations. For instance, a regulation may entail private decision-takers determining in advance of an investment whether authorisation fees will increase and whether permit requirements will stay the same over the life of the project. These will affect its projected profitability. Thus private organisations need to assess whether their activities will be compliant, that is, in accordance with the framework in place which

[307] Report of the Commission of inquiry into the Tax Structure of the Republic of South Africa (RP 34/1987). (Chairman: Mr Justice CS Margo- 'the Margo Report') cited in Henderson "Fiscal incentives – conceptual framework" (*supra* note 221) at 55.
[308] Henderson "Fiscal incentives – conceptual framework" (*supra* note 221).
[309] The system of direct regulation in South African environmental law comprises the use of penalties, permits and requirements for monitoring and enforcement of regulatory conditions in practice.

provides the motivation for them to acquiesce. The rewards for complying can range from simply avoiding the payment of penalties to new opportunities for anticipating and accessing future economic gains.

As previously remarked, these instruments are based broadly on the international environmental law principle of the polluter or user pays.[310] Most important on the debit side of the balance sheet, prevention or mitigation costs arising from environmental damage must be internalised – recognised and acted upon - by the responsible enterprise rather than be imposed on society at large.

Information permitting, explicit charges are attached directly or indirectly to activities that diminish environmental values such as loss of biodiversity. In this use they are negative measures in that they impose *costs* to discourage unwanted behaviour. These charges need to make up for the impact of the damaging activity on all sectors of present society, as well as the environmental impacts likely to be experienced by generations peopling future societies.[311] In this way environmental costs that would previously have been unaccounted for would now be dealt with through assigning responsibility to the users of natural resources who are likely to impinge on biodiversity.[312] These are ideal outcomes not easily realised for multiple reasons as we have argued throughout this thesis.

Performance Bonds As policy instruments, performance bonds require that a government body, designated with the responsibility to administer use of a natural resource, has to be provided with a bond as a form of financial security by the private enterprise that is using the resource and likely to modify a natural habitat. In other words, a resource user pays an advance fee or financial guarantee to the government as one of the requirements laid down in the approval process regarding the operations they hope to engage in.

Thereby the government authority is guaranteed sufficient funds to cover costs of rehabilitation in the event of a resource being unsustainably exploited or that the indirect impacts on biodiversity are unacceptable. In theory this is so regardless of the liable company's financial situation after the damage is incurred.[313] The funds are held by the relevant authority and are returned on condition that the company meets the stipulated environmental objectives. The value of the bond is dictated by market competition for access to the resource, so a key function of the mechanism is that it influences individual behaviour. Posting a bond acts as a negative incentive to resource users in that it discourages actions that may have unfavourable environmental consequences. Bonds can be applied flexibly by taking various forms in a number of settings including mining, forestry, agriculture and development programmes.[314] Repayment can be withheld in

[310] The polluter-pays-principle holds that polluters when using resources should *internalize* all the environmental externalities of their activities. These can be positive as well as negative.
[311] This is an ideal still beyond the current state of knowledge held by researchers and policy-makers.
[312] This could occur either directly or as a by-product of an activity.
[313] If biodiversity impacts occur as an external effect of the economic activity taking place, for example.
[314] J Shogren, J Herriges and R Govindasamy 'Limits to Environmental Bonds' (1993) *Ecological Economics* 8 (2) 109-133; L Cornwell and R Costanza 'Chapter 13: Environmental Bonds- Implementing

proportional amounts to the degree of assessed impact on the environment once the activity for which the bond has been put up has ceased.

So in design performance bonds assist biodiversity conservation by providing a financial guarantee that the biodiversity rehabilitation for which the bond is submitted is in principle secured regardless of the outcome of a destructive activity. An incentive is created for the private organisation submitting the bond to achieve a specific objective in order to secure some return from the bond. In cases where the natural status of a landscape needs to be preserved, other factors relevant to biodiversity conservation will need to be considered like species survival and erosion-based loss of soil. However the reactionary nature of a bond – reacting after the fact - renders it unable to deal with consequences like species extinction or other irreversible impacts on biodiversity.[315] This makes it less useful than the other disincentive instruments discussed below.

A range of forms exist[316] by which bond finance can be provided by the resource user. These are potentially useful in all environmental sectors, including fishing, agriculture, mining, forestry, water management, and general infrastructural development. The Minerals and Petroleum Resources Development Act (28 of 2002, the MPRDA)[317] specifies financial provisions of this kind, for example.[318] On a lesser scale, performance bond-like provisions appear in the NWA with regard to water use;[319] in the MLRA in the context of foreign fishing;[320] and in NEMA regarding extensive development projects.[321] For the present purpose, performance bonds in the context of mining are the focus of attention, with the MPRDA provisions discussed as *illustrations* of the general opportunities and constraints that the use of performance bonds present.

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the Precautionary Principle in Environmental Policy' in C Raffensperger and J Tickner (eds) *Protecting Public Health and the Environment* (1999) Island Press, Washington DC at 220-240.

[315] Performance bonds also do not motivate companies to take measures that reduce the impact of their activities on the landscape in the first place. They require only that companies invest sufficient money to cover the rehabilitation of damaged landscapes and do not promote preventative or even precautionary measures that minimize impact. In the case of non-renewable resources this is a pertinent concern in allowing depletion that cannot be restored.

[316] One is the commitment upfront of capital funding. Guarantees for adherence to environmental protection standards can also be obtained by the government authority through resource users paying risk premiums to insurance companies, the establishment of dedicated trust funds; bank guarantees; or mandatory liability insurance.

[317] Section 41 prescribes that applicants for prospecting or mining rights and mining permits make financial provision for negative environmental impacts that could result from the activity prior to the environmental management plans (prospecting rights and mining permits) and environmental management programs (mining rights) being approved. This will be discussed further below.

[318] *A Mining and Mineral Policy for South Africa* (1998) Department of Water Affairs and Forestry (http://www.dme.gov.za/publications/wp_min/whitepaper.html) endorses the use of (i) disincentives for retention of mineral rights (translated into mining rights under the MPRDA) and (ii) incentives to encourage beneficiation. As they are posed in this policy document, these incentives can affect perversely a range of landscape considerations impacting on biodiversity.

[319] Section 30 provides for financial security to be put up by the water user to ensure that all conditions under which the water authorization was granted are fulfilled.

[320] Section 39 (4) provides that foreign fishing vessels exploiting fisheries in the EEZ put up financial guarantee that they will fulfil their obligations under the MLRA.

[321] Section 24 (5) (d) provides for the state's requirement of financial security to ensure that conditions of environmental authorizations are adhered to by the recipient.

As reiterated throughout this thesis, where threatened natural resources exist on private land but are in the public trust, state ownership of a particular resource is *not* a prerequisite for government to act as the sole authority allocating use rights.[322] Therefore in principle the use of performance bonds could be extended to other natural resource sectors, like commercial fishing licenses for domestic companies and foreign companies applying for bio-prospecting licences.[323]

Performance bonds could be used in these new ways to ensure, for instance, that foreign pharmaceutical companies comply with their statutory obligations to conserve, and that authorities if the need arises could tap into the bond proceeds to restore natural capital where companies do not comply. Biodiversity permitting provisions could be useful to implement performance bonds along these lines but the statutory feasibility of this has to be assessed.

In the Biodiversity Act the set of interests to be protected prior to the issue of bio-prospecting permits is extremely complex. These range from assurance that there has been full disclosure and prior consent from stakeholders to the establishment of material transfer, as well as benefit-sharing agreements between local stakeholders and bio-prospecting companies.[324] If performance bonds were deployed here as an alternative lever of control this might streamline the administrative process as there would be less pressure on authorities to ensure in advance whether bio-prospecting companies have fulfilled all their obligations under the act. It would also ensure that bio-prospecting companies come to see it in their self-interest to abide by the provisions.

Performance bonds could be useful tools in circumstances where there is disagreement in deciding whether the Precautionary Principle[325] has been adhered to or not. For instance, with regard to genetic modification, performance bonds could be a valuable tool. A major concern with GMOs[326] is that there is significant uncertainty in the science applicable

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[322] In South Africa, particularly concerning natural resource use and access, there are a number of other factors likely to be considered at least as important as environmental performance when authorizations to exploit are issued. It will be argued below that the most pertinent of these are socio-economic in nature. Given the political dispensation that dictated natural resource use and access in the past (when natural resource use benefited mainly a small section of the population), in many instances what the socio-economic dimension of a policy equates to in contemporary South Africa is transformation.

[323] That is, exploiting plants with potential medicinal uses.

[324] Section 82.

[325] This principle recognises uncertainty in current scientific knowledge and reflects the scope for environmental measures that anticipate possible revisions on the basis of future changes in scientific knowledge. The principle reverses the normal burden of proof and places it on the person or persons who intend carrying out an activity that may cause environmental harm. However, the legal status of the Precautionary Principle is highly controversial and there have also been disagreements over its exact meaning. Principle 15 of the Rio Declaration is a widely accepted expression of the Precautionary Principle. Other formulations of the principle appear in the Preamble to the Convention on Biological Diversity and in article 3 of the Framework Convention on Climate Change. In South Africa it is reflected as a principle of NEMA, appearing too in numerous other pieces of sectoral environmental legislation.

[326] 'Genetically modified organisms'

over whether there are likely to be unforeseen environmental impacts resulting from genetic modification.

Financial guarantees could be required prior to authorisation for the release of GMOs into the environment being granted. This is especially relevant considering that R. 386 of the NEMA Regulations [327] concerns "The release of genetically modified organisms into the environment in instances where assessment is required by the Genetically Modified Organisms Act, 1997 (Act No.15 of 1997)". This refers to the listed activity number 21 that may not commence without environmental authorisation from the competent authority, and which is not forthcoming without an EIA initially having taken place. Yet somewhat paradoxically there is no EIA required under the GMO Act for the release of GMOs into the environment.[328] Companies like Monsanto who engage actively in genetic modification experiments and fund numerous university-based research projects could be required to put up performance bonds that serve to protect biodiversity from the unforeseen impacts of new kinds of genetic material.

But as a policy measure performance bonds in this context are not optimal. If irreversible impacts occur as a result of genetic modification then no amount of money is sufficient to rectify this situation. Yet they could be used as a means to make scientists more aware and more cautious about the range of possible environmental effects. Currently the broader population are forced to accept the word of geneticists on this issue. So viewed performance bonds complement the NEMA principles of increasing precaution as well as public participation.

The MPRDA is an example of South African natural resource law that relies on the use of performance bonds. The MPRDA requires financial provision in the cases of prospecting rights, mining rights and mining permits aimed at land rehabilitation[329] along with environmental impact management once mining operations have ceased.[330]

The MPRDA provides for annual reassessment by independent assessors[331] of the mining operations for which financial insurance has been provided. One drawback of the MPRDA financial provisions is that the obligations of the mineral resource users terminate once a closure certificate is issued to them by the DME. This is a weakness of the stipulation in that if funds provided as insurance are returned on issue of the closure

[327] In the *List of activities and competent authorities identified in terms of sections 24 and 24D of the National Environmental Management Act*, 1998.
[328] Listing such an activity under the NEMA regulations is therefore pointless. It is also misleading in that it gives the reader of these listed activities the impression that the release of GMOs into the environment is being guided on some level by EIA generated information as required by a different piece of legislation. This is not the case.
[329] Section 43.
[330] The Department of Minerals and Energy (the DME) either specifies a bank account for the resource user to deposit the required money into or a bank has to provide a financial guarantee for environmental rehabilitation costs on behalf of its client, the applicant company or individual. The other form of financial provision provided for by section 41 (1) of the MPRDA is the formation of a trust fund with the state as listed beneficiary.
[331] They have to be wholly independent of the company authorized to mine the resource.

certificate, no further financial contribution is available for damage to biodiversity that may become apparent *after* the closure certificate has been issued.

Performance bonds by design provide two levels of incentives for mining companies. There is the spur for them to meet the environmental objectives set so that they are reimbursed with the funds put up for the bond. But there is a second level of incentive in that companies need to meet the environmental objectives in order not to jeopardise their reputation, and thus the granting or renewal of authorisations by the state in the future. One example in South Africa is the renewal of a Mining Right. According to the MPRDA, there is no limit on the number of times the thirty year mining right can be renewed.[332] So once a mining right is issued to a company it has a compelling economic motive to retain the right as long as mineral deposits are accessible.

Innovations in their use can turn performance bonds into positive instruments too. One example is the implementation of tax-exempt financing.[333] The interest accruing on the bond originally issued to cover environmental degradation or unforeseen pollution, when paid to the company could be wholly or partly exempted from income tax. This depends on the assessed state of the environment due for rehabilitation once mining activities cease. This would serve as a positive incentive to mining companies in that they would try to lower environmental impacts in order to enjoy additional economic gains during the process. However if this should operate as an increased revenue margin that makes a mining venture viable, it could clearly have perverse effects by raising the probability of damage occurring.

The amount of income tax that the company is obligated to pay could be modified so as to be proportioned to the degradation of the environment before landscape rehabilitation activities begin. This would mean that mining companies would be more wary of destroying the environment despite having a licence to exploit, and also because repayment of the bond to them depends on rehabilitation rather than on preventative measures. The emphasis in their behaviour during production could shift towards the prevention more than the amelioration of damage through restoration.

Although there is a clear incentive for resource users to comply in order to recoup the funds they put up for the bond, there is no additional compensation available for resource users who show above-average levels of environmental performance.[334] In other words, in this instrument the reward is static and no additional reward accrues to resource users who go beyond the basic compliance standards. This is a limitation.

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[332] Section 24(4).

[333] The application of this provision in US jurisdiction is outlined clearly by Henderson in "Fiscal incentives – the way forward" (*supra* note 274) at 164, although a similar scheme is available under South Africa's Income Tax Act.

[334] Performance bonds place responsibility on the consumer of the natural resource but do not evidence the capacity, as devices, to reduce the overall consumption of natural resources, nor to motivate higher efficiency and intensity in user mitigation behaviour beyond the compliance standards.

If regulations set a threshold for rehabilitation liability,[335] are resource users not likely to get as close as feasible to the threshold that constitutes environmental damage? This is a possibility as it would be the least-cost strategy for resource users in some cases. Thus a degree of flexibility is required that gives authorities leeway to decide under specified circumstances whether a part of the bond should be withheld for rehabilitation even after the closure certificates are issued.[336] Otherwise there is no legal provision that protects mined landscapes in perpetuity.

This discussion raises the question whether piecemeal use of financial security measures in exploitation of non-renewable resources may not be suitable where irreversible environmental damage is a possibility? By definition no financial expenditure can rehabilitate irreversible impacts on landscapes within realistic time-scales. This is the dilemma of the Brazilian rain forests[337] and the Siberian tundra.[338] Where irreversible damage is possible – interpreting the word *irreversible* with a time dimension long in human lifespan terms - then performance bonds should be supplemented by direct regulation with criminal sanctions.

If this conjecture is correct it follows that it would have been appropriate if the contravention of financial provisions under the MPRDA had been listed as a Schedule 3 offence. Then, if financial securities are not sufficient to cover environmental damage, a mining company would have an additional disincentive to avoid triggering Schedule 3 penalties. Applied in such instances the criminal sanctions under NEMA would be acting as a last resort or 'long-stop' policy action.[339]

The problem of placing a market value on the impact, positive or negative, on the environment is a persistent consideration here. Once the extractive activity for which the bond has been put up ceases then the holder of the bond, an agency of the state, needs to evaluate whether there are harmful environmental consequences caused by that activity. Impact costs need to be calculated in monetary terms in order for it to be subtracted from the bond value payable to the economic agent. Where resources are non-renewable and damage judged to be irreversible, that such calculations are difficult and subject to dispute goes without elaboration.

On the other hand, if resource users need to raise bank loans to cover this funding requirement, then meeting the interest on the loan may itself constitute a financial burden on them. This could retard mining development by weakening the incentive to invest within the mining industry as whole. Section 2 (e) of the MPRDA points out that

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[335] This equates with either the amount of environmental damage the money put up for the bond can pay for or with the required state of the restored landscape before the bond is returned to the mining company.
[336] The NEMA (S28) Duty of Care would have been a useful 'long-stop' measure here in theory but in Bareki NO and Another v Gencor Ltd and Others 2006 (1) SA 432 (T), it was held that this provision does not apply prior to 1998.
[337] P Boffey 'Penetrating the remote Amazon rain forest' (2000) *The New York Times* 1-12.
[338] D Shapely 'Deep in Siberia's forest, finding clues to the "missing sink"' (1997) *The New York Times* 1-7.
[339] D Farrier 'In search of real criminal law' in T Bonyhady *Environmental protection and legal change* (1992), Federation Press, Sydney.

promoting mineral resource development, along with environmental protection, is a key objective of the MPRDA. One objective needs to be achieved concurrently with the other.

In addition it would help if low-interest loans – lower than market rates because of the subsidy - are made available to finance mining projects. This presupposes though that such loans are earmarked for performance bonds devoted to R&D investment aimed at modifying extraction technology in favour of conservation. By offsetting the costs of getting a loan, such interventions through subsidies may also enable authorities to increase the value of performance bonds required from private developers in certain cases. They provide more resources to rehabilitate biodiversity, while enabling more companies to access the market and potentially raise competitive pressures. But like all interventions using public funds a great deal hinges on accurate estimation of benefits and opportunity costs.

But like all resources drawn from state coffers for a defined purpose, the major consideration is the opportunity cost of spending for that purpose. If used for another desirable objective would this expenditure yield a higher or lower benefit to the public purse? Subsidies need to be carefully considered. There is the potential for low-interest loans to be counter-productive in the long run for the convincing reason that they could accelerate biodiversity degradation.

Disposal Charges It needs noting at the outset that compared to the other disincentive measures discussed here, disposal charges are of ancillary relevance to biodiversity conservation. Charges of this kind are imposed on an individual or organisation treated as a point source – the locus of responsibility – that is legally responsible for releasing pollutants into the environment. But disposal charges or taxes are not currently implemented in South Africa.[340] They are important to biodiversity though in that, in principle, they can regulate the amount of harmful substances released into ecosystems by their deliberate deployment as devices to decrease the attraction of certain courses of action.[341]

In theory, the charges levied on discharge activities could be prescribed by regulation. The charges could differentiate between outcomes by setting standards for type and amount of waste, the manner of disposal, the reception location of disposal and recycling.[342] Simply put, the rationale behind a disposal charge system would be to provide a *positive incentive* for water users to comply with a standard that is

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[340] Although DWAF is in the process of developing a *Waste Discharge System* which imposes a set of tiered charges on water users. Information on the system is obtainable from *Water Quality Management* Series (Sub-Series No. MS11) 'Towards a Strategy for a Waste Discharge Charge System' (First Edition) (2003) Department of Water Affairs and Forestry.

[341] Section 74 (s) of the *National Environmental Management: Waste Management Bill* provides for the minister to use incentives and disincentives with regard to waste management.

[342] An example of existing legislation providing for considerations like the
se is the NEMA: Air Quality Act (39 of 2004). Section 53 (c) provides for the minister to make regulations regarding '…emissions, including the prohibition of specific emissions, from point, non-point and mobile sources of emissions…'

recommended but not necessarily prescribed, whereas *disincentives* would be created to discourage activities in which maximum allowable standards are exceeded. To obtain perspective, private behaviour choices are conceived as comprising a spectrum. On one end adherence to recommended standards is motivated by reward. On the other exceeding prescribed allowable standards is discouraged through disincentives. Yet the functional merits of such a system in practice are still not decidable in South Africa.

One foreseeable problem is that disposal charges levied by the government for a particular activity may not be attuned to the environmental specificities of the area in which the activity is taking place. For instance, in certain areas the quantity of pesticide that the environment has the capacity to absorb sustainably may be higher than in others. In these resistant areas the need to reward farmers for lowering the usage of pesticides will be less than other areas that have greater sensitivity to latent levels of persistent chemicals in the soil and water reserves. The baseline or average use of insecticides can be presumed to vary considerably across different agricultural and ecological habitats. If product charges are not linked directly to identified environmental problems[343] then their application may add to the production costs incurred by a sub-set of land-users whose activities are not imposing an unsustainable impact on the environment. Such additional costs would ultimately be borne by the local community as a whole.[344]

License fees Licence fees are most commonly imposed by the state on private sector activities that impinge on resources under administration, like waters for fishing, game habitats and natural forests. These may directly affect biodiversity through the exploitation of indigenous species or indirectly modify habitats in the case of mining, water authorisations[345] and development approvals. There are a range of variant licence fees. A factor common to them all though is that the amount of fees can in principle be proportioned to the environmental externalities within the sector to which they are applied.[346] But quantifying the externalities in practice remains the biggest hurdle.

The precondition for this tool to function efficiently, and to motivate private resource users to pay licence fees, is the existence of binding legislation that is well-designed for this purpose. Certain requirements stipulated in law have to be fulfilled by resource users before authorisations are granted to them by the relevant authorities. Meeting these requirements makes their economic activities legal.

As mentioned previously, because certain key natural resources are in the public trust in South Africa, like water and minerals, resource users are obliged to apply to the state for authorisation to exploit a particular resource deposit. This can translate into a licence fee payable as a pre-condition for authorisation. Revenue raised from licence fees can be

[343] Pesticide run-offs into a specific water source are examples.
[344] In other words the costs are not internalised by the producer for reasons like information deficiency discussed earlier.
[345] Principle 16 of the *White Paper on a National Water Policy for South Africa* (1997) Department of water affairs and Forestry (http://www.dwaf.gov.za/Documents/Policies/NWRS/) emphasises how economic incentives generally and water pricing specifically can fund water resource management which could have a positive impact on biodiversity, accumulated water conservation and equitable water access.
[346] An example would be the degree of the impact on biodiversity.

used to fund a multitude of environmental objectives, as well as the licence fee administrative costs. In principle they can also approximate the opportunity cost of depleting the natural resource held in the public trust together with the negative externalities imposed on the environment that occur as by-products of this use.

In South African natural resource legislation, paid licence fees confer authorisations for the private use of water,[347] marine living resources,[348] biological resources[349] and minerals.[350] Correctly designed these provisions can take account of the impact that direct extraction of these resources from the natural environment has on the extent of biodiversity. Thus indirect environmental externalities can be accounted for – in principle if not yet realistically - through licence fees required for development authorizations under NEMA[351] and atmospheric emissions licences under NEM: AQA.[352]

This selection of licence uses faces limits in achieving the objectives for which they are prescribed. An overriding reason for this is that they are often inadequately priced against the complex blend of administrative and environmental externalities which they are designed to resolve.[353] A further reason for this limitation is that, because externalities like impact on biodiversity are so difficult to calculate plausibly, the charges levied for licences are viewed as arbitrary. Therefore they are judged insufficiently attuned to the particular externalities that can occur as a result of the activity for which the fee is levied.

One illustration is with water licence fees. Within the national water resource strategy, catchment management guidelines for each catchment area are designed only once the reserve capacity for that area is determined. Resource quality objectives such as the amount of water flow needed to sustain riverine ecosystems are based on such determinations. But these considerations are not explicitly provided for in the pricing strategy of the relevant section 56.[354]

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[347] Water licence fees are provided for under section 41 (c) of the NWA. There are also additional charges provided for in the cases of renewal (section 52 (2) (a)) and late application for compulsory water licenses (section 44).

[348] Regulations read together with the MLRA provide for fees to be charged for commercial fishing rights applications (GN 1809 in Government Gazette 28081 dated 30 September 2005), vessel permit applications, fishing, fish processing and mariculture activities (GNR 878 in Government Gazette 27998 dated 2 September 2005) as well as the use of harbour facilities (GN 223 in Government Gazette 28618 dated 10 March 2006). Although these all vary in accordance with the extent of the activity, the consequent environmental impact and the attendant administrative costs.

[349] Section 12 (h) of the Biodiversity Act provides for the imposition of fees for accessing Botanical Gardens. Section 97 (f) (2) provides for charges on permit applications.

[350] The MPRDA imposes fees on applications for mining rights (section 22), reconnaissance permits (section 13), prospecting permits (section 16) and retention permits (section 31).

[351] Section 25 (5) (c) of NEMA provides for a fee to be charged for applications for environmental authorizations.

[352] Section 37 (2) (a) of NEM: AQA provides for the levying of fees on applications for atmospheric emission licences.

[353] This statement refers back to the assertion made in the section on 'incentives that create markets', that externalities are usually extremely difficult to quantify convincingly. In this regard fees could be too high, too low, as well as failing to distinguish between differential environmental impacts.

[354] Section 56 (3) provides for the differentiation in water pricing between only (i) geographic areas, (ii) categories of water use and (iii) water users.

Yet the costs associated with the indirect loss of habitat through decreasing water availability in a catchment basin arise externally to these provisions of the section. A decrease in a region's biodiversity is an environmental cost integrally linked with water availability, but it is not in itself a consideration easily incorporated into a pricing system. Accordingly water licences should be allocated by pricing only once non-use value services are provided with a proportion of the water reserve adequate for their sustainability.[355]

Product Taxes A main theme in this thesis is that charges or taxes need to be attached to products in order to reflect in their prices the environmental impact associated with their production processes.[356] The activities for which the product taxes are levied generally modify habitats[357] and therefore impact indirectly on biodiversity. Because these impacts have no value thrown up by the market they are difficult to track and as social costs cannot be readily inserted into the prices of products that do have a market value.[358]

Product taxes applied currently in South Africa occur in the transport, electricity and water sectors.[359] The initial intention behind their introduction was the raising of revenue, not environmental protection.[360] Therefore scope exists to improve both conservation outcomes as well as the behavioural motivation these incentive-creating taxes currently provide. Taxing environmental bads (like pollution) and reducing taxes on goods (like labour) is termed the *double-dividend-hypothesis.* [361]

These dove-tailing objectives can be concurrently achieved here, where an improvement in environmental quality can be secured (the first dividend) simultaneously with an increased efficiency in the tax-system (the second dividend). There is a degree of disagreement as to how this can be brought about.[362] The result would be to minimise the burden of taxes on affected sectors while ensuring efficient behavioural incentives apply to achieve environmental objectives.

An example is the continual rise in the real price of liquid fuel in South Africa in recent decades. As a result increasing numbers of people are discouraged from using their private vehicles as much as they are used to.[363] In consequence the overall national emission quantity is likely to have been marginally lowered. In economic theory carrots

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[355] Even though this needs to be based on crude estimates, the biodiversity crises currently experienced indicates that this nevertheless may be a necessary measure.
[356] Charges here can be imposed on *inputs* to economic activities as a means to indirectly control the adverse environmental impacts resulting.
[357] For instance, product charges can be levied on batteries or different forms of packaging like plastic bags which, if not accounted for, could end up in an ecosystem and diminish biodiversity.
[358] Effectively the taxes are imposed on the harmful processes by which the valued products are produced, through schemes like deposit refund systems and differentiated tariffs for waste related services.
[359] See Appendix 1.
[360] *National Treasury Paper* (*supra* note 264) at 9.
[361] *National Treasury Paper* (*supra* note 264) at 10.
[362] *National Treasury Paper* (*supra* note 264) at 11.
[363] People may prefer to ride bicycles and take public transport than spend extra money on fuel. This is an untested presumption.

are considered cheaper than sticks. This means that agents acting out of perceived self interest when the right incentives are created for them impose *fewer* resource costs on society than when they have to be regulated to do the right thing. Product taxes are not explicitly environmental in the example of a fuel levy but in the way they operate they are in potential a means to an environmental goal. The current demand side levy on fuel stands at ten cents per litre.[364] This could hypothetically be pushed upwards to stimulate the development of environmentally efficient fuel technology and reduce further the use of private vehicles.

In theory product taxes could be extended to numerous other resource sectors as long as perverse incentives are not created by accident. For instance, product taxes could be imposed on various other fuels or harmful substances that contribute to environmental externalities such as coal, methane and pesticides. In fact product charges could be attached to a large array of other market goods. The key objective in doing this would be to push down demand for them and stimulate more sustainable processes and products as well as various forms of recycling.[365]

User Charges User charges are imposed on the private sector through levying a fee for providing certain services and resources from the public sector such as electricity, waste collection and water supply. They can also be imposed on public access to protected areas. User charges have similar applicability to private biodiversity conservation as the three disincentive devices discussed already. They motivate more prudent consumption of resources and awareness regarding harmful inputs into the environment. Thus they can function as a vehicle to put a price on certain services that may have direct or indirect impacts on biodiversity. They can also influence wider economic behaviour, being that of other economic agents, as the charge imposed on resource users and producers enters the market as data for decision-making.[366]

User charges to serve a variety of purposes are found in the regulatory frameworks of a number of national jurisdictions around the world.[367] In South Africa the dominant uses they apply to[368] are waste collection charges imposed on a local government level, water provision charges[369] and electricity charges.[370] Because water is a scarce resource in

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[364] See http://www.dme.gov.za/pdfs/energy/liquidfuels/dsml_levy.pdf (on 24 December, 2007).

[365] Options in extending the use of product charges are recognised by the *National Waste Management Strategy* (1999) (http://www.environment.gov.co.za/ProjProg/waste.html) , *National Waste Management Strategy Implementation Programme* (1999) (http://www.environment.gov.co.za/ProjProg/waste.html) and the *Action Plan for Waste Minimization and Recycling* (1999) (http://www.environment.gov.co.za/ProjProg/WasteMgmt/waste.html)

[366] User charges have to be estimated using market data, together with non-market cost components, so they are not wholly determined by market functioning.

[367] For an overview see *The Political Economy of Environmentally Related Taxes* (2006) Organisation for Economic Co-operation and Development; *Environmental Fiscal Reform: What Should be Done and How to Achieve It* (2005).

[368] That is, the charges that raise the highest amount of revenue.

[369] See the *Pricing Strategy for Water Use Charges* (GN 1353 Government Gazette 20615 of 12 November 1999) established under the NWA in relation to use of water resources.

[370] The Electricity Act (41 of 1987) imposes a set of electricity tariffs that are extremely low. Paterson and Winstanley "Improving the approach to biodiversity conservation" (*supra* note 296) make the point that

South Africa, user charges to reflect this state of affairs would strengthen the incentive for water users to economise as well as to innovate in order to decrease consumption.[371] This would mean more water is available to offset negative externalities so as to maintain biodiversity.

Extending the utility of disincentives What is socially optimal is for private users of resources to be continually conscious of the impact their behaviour has on the environment, and therefore of their obligations stipulated by law. But a second best alternative is for positive rewards to be incorporated into the design of, for example, water pricing strategies and effluent charge systems,[372] in order to motivate conserving behaviour in private sector water users.

It is important to note that for user charges to operate effectively as disincentives they need to encourage private organisations to go beyond the minimal thresholds prescribed by legislation as compliant. To achieve this, in some manner rewards need to be incorporated into the operation of user charges. These require clear definition and accurate estimation within different resource sectors.

Taxes with differentially higher rates can be imposed on activities that do not adopt the most practicable environmental option.[373] By contrast, if users engage in economic pursuits that voluntarily avoid inflicting environmental harm, then charge reductions may be given to encourage such decisions.[374] For instance, the water pricing strategies contained in the NWA provide for this possibility.[375]

Other practical examples would be if a farmer is intentionally and voluntarily decreasing use of pesticides and producing organic fruit, thereby lowering the level of durable pollutants introduced into inland water reserves. The water management institution authorised to collect charges for water use in the catchment area could reward such voluntary action by reducing the unit prices that the farmer pays. [376] Another instance

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this is for two interrelated reasons. Firstly, South Africa has a disproportionately high reliance on coal compared to the rest of the world. Secondly, this pricing strategy does not reflect the externalities that such a tendency entails.

[371] Increasing the productivity of the water user through technological innovation would also be an effect.

[372] Reference to Section 56 of the NWA is included here as the framework it dictates seems particularly flexible.

[373] These, like certain kinds of mining, are production strategies not sympathetic to biodiversity conservation. Mining is particularly relevant as the MPRDA does not provide legislated mechanisms to ensure that efforts are made to *reduce* adverse effects.

[374] Reductions in licence fees for example.

[375] Section 56 (4) (b) (i) states that pricing strategies can differentiate between different types of water uses on the basis of 'the manner in which the water is taken, supplied, discharged or disposed of…' and 'whether the use is consumptive or non-consumptive…'. Further, a pricing formula for specific charges scaled against volume of water used is permitted to differentiate between 'different water users' (56(3)(a)[iii]) and 'different categories of water use' (56(3)(a)[ii]).

[376] Such a provision is efficient because showing environmental awareness in the selection of pesticides used can also exert a significant influence on environmental performance. The same encouragement can be provided to a water user who constantly under-uses an allocated quota. Accordingly, Section 56 (6) (b) states that the pricing strategy for water use charges may consider incentives to '…reduce detrimental impacts on water resources'.

would be if an industrial activity is using recycled instead of new inputs like paper. The industrial company could be granted recognition for such voluntary mitigation, perhaps through a reduction on a product tax depending on the administrative feasibility at this micro-level.[377]

Weaknesses of licence fees, product taxes and user charges Monopoly power is a challenging concern. Most established companies are likely to have adequate financial resources to pay charges that are raised on environmental grounds, whereas smaller companies may have less financial reserves to pay higher charges and still compete with the larger companies. A situation would then result where product charges are advantageous to large companies in that they operate as mechanisms tilting the balance against competition in the market. This could have a perverse effect. Larger companies could intentionally impact negatively on a natural resource in order to force competitors out of the market, assuming that charges are uniform industry-wide. If government is led to *increase* product charges for all resource-using companies, then conceivably monopolies could strengthen in this way. It is difficult *a priori* for policy-makers to judge the realism of this possibility.

This scenario for natural resource use is also applicable to effluent and disposal charges. The actions of certain companies may trigger an impetus for authorities to raise the permit requirements for activities that cause pollution as a by-product, thereby forcing smaller producers out of the market.

A reasonable presumption in most systems is that taxes obtained by the government are earmarked for addressing the specific environmental destruction that results from production in the sectors on which the charges are levied. But this needs precision in order to evaluate whether user charges deal adequately with externalities from particular activities. If revenue from charges flows instead to the general fiscus then one presumes that disincentive instruments put in place are not performing acceptably the function for which they are designed.[378]

In companies operating in lax jurisdictions, charge systems may be perverse for biodiversity conservation. Where the income generated from charges is channelled by governments into the national budget rather than into ameliorative actions, then negative net effects on the environment are a relevant concern. One solution conducive to sustainability objectives would be to redirect the generated funds back into other restoration schemes, but there have to be in place legal, or possibly even constitutional, safeguards that this will be the preferred outcome.

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[377] In international environmental law, the underlying compensation principle is more complex. It may involve importing countries illegitimately imposing production restrictions on exporting countries. Though not directly relevant here, this analogy to public-private sector negotiations within national boundaries is nonetheless suggestive.

[378] On this note it is worrying that fiscal authorities are opposed to earmarking taxes for environmental purposes, the reason given is that it puts stresses on the budget process: see the *National Treasury Paper* (*supra* note 264) at 101.

One way of achieving this would be if charges are paid into a designated fund so that the authorities administering the fund earmark payment receipts for particular environmental schemes. Henderson (1995)[379] notes that taxes levied on environmental goods and services are legitimately regarded as a fiscal incentive for environmental protection only where the revenue is applied to support such services.[380] If this is not the case environmental taxes like pollution taxes, which can raise significant amounts of revenue in economies where national output is disproportionately resource-based,[381] could just be another means for raising general state funding revenue and in addition are subject to underhand activities in the political process.

Impacts on the broader economy are a further concern. Loss of state revenue resulting from environmental taxes that cause a lowered activity rate may translate into loss of significant numbers of employment opportunities in the public sector. If environmental taxes are to be effective as well as enduring, the value of their conservation gains has to be balanced against socio-economic development objectives foregone when they inhibit production. Conservation goals are intended to dove-tail with income generation as prescribed in most natural resource legislation. But once again the estimation difficulty, and wide error margins in the valuation of environmental benefits like higher biodiversity conservation, is a major limitation.

The distributional impact of use charges across different income groups is yet a further concern because it is a difficult task to anticipate impacts accurately at the micro-level. For instance, defining poverty and measuring changes in its incidence remains a source of dissension amongst government and private statisticians as well as economists in South Africa. This was clearly evidenced in the closing months of 2007.[382] In addition, the fact that certain companies can be excluded from the market because they cannot afford to pay high user fees also means that competition in the market for user rights will decline. Consequently such markets will be thinner – with fewer participants – and not as active when measured by the volume of transactions in a period of time. The net effect can be lowered efficiency and probably lowered equity outcomes.

Another criticism of direct regulation in environmental protection is that it tends to be inefficient under certain circumstances.[383] User charges illustrate this criticism well. If predefined standards are set for acceptable pollution then polluters are all expected to adhere to the same standards. Yet the cost of adhering to the standards set may differ

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[379] P G W Henderson 'Fiscal Incentives for Environmental Protection- Conceptual Framework' (1995) *South African Journal of Environmental Law and Policy* vol 1 55

[380] As discussed below, a key criticism of market-based incentive devices used to achieve environmental goals instead of direct regulation is that there is lower assurance that the environmental goals will be achieved. For example Kidd "Criminal sanctions" (*supra* note 24), Wilkie "Incentives Canada" (*supra* note 29) and James "Australian Incentives" (*supra* note 37) amongst other sources.

[381] *The Economist* (US) (8 August 1992).

[382] This refers to the dispute between the South African institute of race relations and the Presidency about the extent of poverty reduction achieved in recent years.

[383] S E Gaines and R A Westin *Taxation for Environmental Protection: a Multinational Legal Study* (*supra* note 280).

radically from one producer of pollution to another. User charges, in principle but perhaps not in practice, have the potential to be tailored to address this problem.

The fees levied have to serve as a deterrent to polluters and resource users but in order for product charges to do this they need to be high enough to impose financial loss and spur behavioural change by enterprises and other organisations in the broad field of natural resource use. When levied on companies with large contingency budgets, the product charges may often not be high enough for the purpose.[384]

There have been concerns raised also over the proportion of total costs accruing to society as a whole that should on various grounds be borne by the community as a whole. For instance, Henderson (1995) points out that the costs of administering user-charges should not be borne entirely by the user but a portion should be met by the broader tax-paying population as they have a preponderant interest in natural resources being effectively regulated.[385] But this gives rise to the potential problem that individuals contributing towards an environmental objective – the average tax-payer - are mostly not responsible for the pollution or resource degradation (for which amelioration) ends up being paid. This practice contravenes the *polluter-pays-principle*. Gaines and Westin (1991)[386] refer to a 'coarse kind of justice' when examining the obligations placed on current resource users to pay for past polluters' activities. This line of reasoning is familiar to South Africans. Recent implementation of policies like affirmative action in the pursuit of re-distributive or transformation objectives illustrates that the present government would find little fault with this logic.

4.2 Information incentives

Information incentives – access to new kinds and sources of dedicated knowledge about the environment - can be extremely influential tools for biodiversity conservation. But this will vary in accordance with the sector in which they are deployed, as well as with the specific mechanisms used to implement them. If one types a set of word cues like 'organic produce', 'recycled packaging' and 'genetically modified crop traceability' into a South African search website, the quantity and nature of the positive responses one gets evidences how powerful new sources of information are becoming.

Information incentives can be categorised by the way they operate and the avenues of communication they use to mould behaviour. What drives the use of information as a source of motivation for behaviour change is the collection and public distribution of

[384] This possibility is quite evident in international marine pollution law where the limits on financial liability for oil spills are frequently too low to pay for realistic levels of remedial action. Consequently there is minimal motivation for oil companies to go beyond the technical regulations set by MARPOL 73/78 (International Convention for the Prevention of Pollution from ships, 1973, as modified by the Protocol of 1978 relating thereto) and make their tankers more secure than is required by international law.
[385] Henderson "Fiscal incentives- the way forward" (*supra* note 274) at 157.
[386] S E Gaines and R A Westin *Taxation for Environmental Protection: a Multinational Legal Study* (*supra* note 280). This quotation is cited in Henderson "Fiscal incentives- the way forward" (*supra* note 274).

information. State providers disseminate information to nurture and develop specific relationships. Two are particularly important. Firstly, the relationship between the private producer and the consumer is mediated through the use of labelling, being new information about the commodity. Both buyers and sellers behaviour can be shaped by this device. Secondly, the relationship between the private producer and the government in the flow of information both ways is vital in the case of environmental reporting, particularly where market as well as state failure is inherent.

4.2.1 Environmental reporting

Reporting is a method of placing an obligation on enterprises to provide responsible authorities with information about the environmental impact of their actions. It conveys to the state evidence that a certain level of environmental protection has or has not been instituted by the enterprise. The means of reporting[387], as the *lens* through which the environmental performance is evaluated, is a central influence shaping the flow of this information. In consequence standardisation in methods of environmental reporting is essential. Increased efficiency in reporting mechanisms equates with decreasing monitoring responsibility and thus lowered administrative costs for the state.

Environmental reporting is relevant to biodiversity conservation by providing a means through which the biodiversity status of a natural resource like land or water can itself be used as a positive instrument. Private entities can use information about their conservation activities as a vehicle, first, to achieve market related advantages over competitors, and second, to improve their conservation reputations with the state.[388] The usefulness of the reporting activity depends on the nature of the information that the enterprise conveys. Given the growth of environmental awareness in all societies it is plausible that organisations increasingly compete to be in good standing with watchdog authorities. If widespread there is a key motivating factor for them to invest in biodiversity conservation. It reflects positively in their performance reports, which ultimately play a critical role in how companies develop reputations in the eyes of regulatory bodies, their work-forces as well as customers.

In terms of management, provision for reporting appears in most environmental sectors in South Africa including protected areas,[389] biodiversity,[390] minerals,[391] and veld fires.[392] Conversely, information provision can operate also as a disincentive device because

[387] In other words, the regulations or laid-down guidelines which reports need to meet.
[388] This could precipitate the activation of related rewards like regulatory incentives.
[389] Section 43 (3) (b) of the National Environmental Management: Protected Areas Act (10 of 2004) states that annual reports need to be submitted for designated protected areas.
[390] Under the Biodiversity Act, the Minister can make regulations for reporting obligations in bioregional plans (section 41), biodiversity management plans (section 45 (b)) and biodiversity management agreements (section 44).
[391] The MPRDA provides for annual reporting responsibilities to be built into the design of environmental management plans and environmental management programmes applicable to the holders of mining rights and mining permits under Section 39.
[392] Chapter 3 of the National Veld and Forest Fire Act (101 of 1998) provides for the communication of fire danger ratings by designated organisations (section 10). Section 11 provides further that the organisations would get paid for the provision of such information.

reporting responsibilities are triggered through emergency incident[393] and 'duty of care' type provisions[394] in natural resource legislation. Failure to report results in imposed costs can trigger criminal sanctions.

Where guidelines for performance reporting vary between municipalities, provinces and nation states, this implies that the information conveyed by organisations can vary too. Thus the state can obtain inconsistent judgements about companies' environmental performance because the environmental report itself – for an industry or sector - is dependent on each company's interpretation of the reporting guidelines.

4.2.2 Labelling and Marketing

The bringing into being of private conservation organisations, and the agreements needed between all decision-takers that they entail, sets the stage for the use of labelling and marketing devices. Labelling is an important means of uniting private producers through a set of common principles or behaviour criteria allowing them to use a specific label on their products. The policy intention is to encourage enterprises to adopt programmes and to become members of organisations that have positive impacts on biodiversity.

The unification of enterprises through the common pursuit of more environmentally sustainable practises is highly likely to foster the retention of biodiversity. Incentives for farmers – as enterprises - to become involved with conservation organisations and to initiate conservation agreements would arise in the market-place[395] if environmentally benign products are identified to consumers.[396] For instance, if the labelling on a particular product indicates that its producer is a member of a 'regional conservation committee',[397] it signifies that the production process is conducted in an environmentally sustainable way.[398]

Labelling has three functions in biodiversity conservation. First, as mentioned above, it acts as an incentive reward to producers in that they get higher prices for their products by obtaining access to niche markets containing discerning buyers. Secondly, eco-

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[393] Section 30 (3) of NEMA provides for the responsible person to '…report through the most effective means reasonably available (a) the nature of the incident, (b) any risks posed by the incident to public health, safety and property, (c) the toxicity of substances or by-products released by the incident…' I refer here to NEMA as it is the general framework law within which emergency incident and duty of care provisions in the NWA, MPRDA and the Biodiversity Act were moulded.

[394] For instance, Section 28 (4) (a) of NEMA states that if a Duty of Care has been triggered the state may direct relevant persons to 'investigate, evaluate, and assess the impact of specific activities and report thereon'.

[395] The marketplace is the institutional means through which goods, services and money move between buyers and sellers. As such it comprises the nucleus or centre of a system allocating resources via information conveyed by channels of demand and supply.

[396] Labelling could be a means to disseminate information into the public domain about an organisation's objectives and about the goals of its individual members. Consumers are able to identify themselves with these objectives through buying eco-labelled products.

[397] Provided for by CARA (Section 16).

[398] Labels containing information about environmental performance can reward producers in that they add value to the product itself enabling such enterprises to increase the prices of the product.

labelling is a useful tool for biodiversity conservation as it is an aid in putting market-prices on ecosystem services that otherwise would not be subject to valuation. Thirdly, labelling that identifies a commodity with a specific regional organisation is a means of tracing such products back to their source once they have entered regional or national markets.

Labelling is similar to reporting devices in that it is a provider of information but to a different audience. Where reporting of regulatory compliance is about projecting an image of high environmental performance by a producer in the eye of the relevant authority, labelling does so in the eye of the discriminating consumer or service-user. Consumers can obtain information regarding the behaviour of a producer via the contents of a so-called *eco-label*,[399] in that such labels can be extended beyond food products to the provision of services with environmental dimensions. Labelling schemes currently in operation in South Africa include the Biodiversity and Wine Initiative (the BWI),[400] the sustainability index,[401] as well as numerous other recycled packaging and organic produce ventures.

The utility of labelling to achieve conservation goals does however need evaluation at the national level where policy instruments are devised and tested. For instance, some minimal degree of consumer environmental awareness is a pre-requisite to create consumer demand. Such awareness is therefore a critical driver of eco-labelling in acting as an incentive to producers.

Yet in many developing countries with low per capita incomes, causes of human stress like acquiring access to food are problems for large proportions of the population. Thus environmental considerations in consumption fade in significance. In these circumstances information about production and processing methods is likely to be a less useful tool than direct regulation to obtain support for conservation from private decision-takers. There is clearly a growing popularity of *green* products in societies where individual consumers have more resources. This may continue to drive the implementation of eco-labelling as a biodiversity conservation tool if it is a function of growing per capita income. This is a plausible but untested conjecture.

[399] It is therefore a critical factor in the moulding of producer behaviour towards sustainability.
[400] The BWI is an association of wine producers where the individual members have established a common environment across their properties within which biodiversity best practices can be adopted in ways that assist the South African wine industry. The dovetailing between biodiversity protection and marketing implies a mutually beneficial relationship between BWI members and their units of environment as members choose voluntarily to implement biodiversity guidelines in their production practices
[401] The Johannesburg Stock Exchange launched a Sustainability Index in 2003. The Index lists companies that pursue environmentally sustainable business practices and rewards them through higher share values. Further, listed companies can use the fact that they are listed to identify themselves with fellow members through product labelling. The intention is to encourage private sector companies to adopt programmes that possess biodiversity protection as one objective.

4.3 Regulatory incentives

Regulatory incentives are currently absent from South African environmental legislation. To avoid extensive discussion in the abstract rather than about practice then this section will be kept brief.

Regulatory incentives can be used to encourage and reward voluntary initiatives by organisations or individuals that have as a central objective, minimising biodiversity impacts resulting from their own activities. Even though a range of self-regulatory and co-regulatory mechanisms have been made available in the last ten years in South Africa, many of which are relevant to private biodiversity conservation and were mentioned above, none have been implemented.[402] They can be used to motivate enterprises to go beyond base-line compliance with the regulatory conditions applicable, that is, to adopt practices leading to conservation outcomes higher in extent, depth and value.[403] What influences drive individuals and companies to modify their behaviour can range on a spectrum from positive to negative in their effects.

Negative examples or disincentives would be industries that anticipate future statutory impositions of stricter limits, and in response they modify their technological standards in order to offset or pre-empt future cost increases. *Positive* incentives could be the authorities relaxing their monitoring of certain organisations – for a range of reasons like community empowerment - or giving preferential treatment to certain applicants in the processing of permit applications so as to reward exemplary environmental performance.

Modifying or deferring regulations for enterprises that take conservation actions without regulatory prompting, and show high levels of environmental performance and awareness in the process, is a positive incentive device discussed extensively in the literature.[404] The reward to the beneficiary can involve relaxation of the regulatory burden in another sphere of legislative consideration, like the number of black staff and women the company is obliged to hire under other legislation.[405] However such trade-offs or cross-cutting considerations need careful weighing-up in South Africa, one concern being the capacity of the relevant authorities to administer such complexity in enforcement. Although contributing a serious political dimension to the implementation of regulatory incentives in South Africa, their effectiveness may be limited.

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[402] W Scholtz 'Introduction of Environmental Management Co-operation agreements in South Africa' (2004) 11 (1) *South African Journal of Environmental Law and Policy* 31-52; N Acutt 'Perspectives on Corporate Responsibility: the South African Experience with Voluntary Initiatives' (2003) 10 (1) *South African Journal of Environmental Law and Policy* 1-20.

[403] One example would be an industrial company taking measures to produce cleaner discharge water than is prescribed by the effluent discharge thresholds set by the relevant water authority.

[404] Regulatory incentives are being implemented in Australia and Canada (see Wilkie "Incentives Canada" (*supra* note 29) and James "Australian incentives" (*supra* note 37)) Information on the rationale behind relaxing regulations for high environmental performance is implemented in the 'Performance Track Program' in Canada (see http: //www.epa.gov/performancetrack/index.htm.).

[405] The proposal to make up a deficit in one sphere of concern by a gain in a different one is alluded to in the Margo Commission Report. The context of discussion is fiscal incentives. The Report states that in principle a fiscal incentive lowering revenue in one sphere like the environment should be paid for by an additional receipt for the fiscus elsewhere in the system.

Wilkie [406] describes how regulatory incentives designed to be negative in effect can be used to induce environmental performance in enterprises that goes beyond basic compliance levels. She uses the example of prospective new regulations to show how they can serve as incentives to organisations to comply voluntarily in advance of more stringent provisions (if the looming regulations are more stringent than the current ones). Regulatory uncertainty and sudden additional compliance costs are thus avoided if private action is taken prior to the regulations in prospect coming into force.

However, it is quite possible that an incentive lever of this kind could work in the opposite direction too. If more stringent regulations are looming ahead for a particular industry, this could serve perversely as a motive for enterprises to engage in *more* environmentally destructive activities within the current regulatory compliance range, in order to profit *before* the more stringent regulations come into force. Current development of the coastal zone in South Africa is an example of this tendency. Many developers are rushing to get EIAs approved for strips of the South African coastline before the Integrated Coastal Management Draft Bill comes into force.[407] This legislation will formally protect many of the ecological resources in the coastal zone currently not recognised under the Sea Shore Act (21 of 1935).

Resources are required for the administration of regulatory incentives put into effect by new statutes. Although statutory changes may operate as incentives for enterprises to take anticipatory measures they are unlikely to fulfil only this function. Voluntary private conservation action that responds to statutory change should be seen as a by-product within a broader shift in environmental management practice.

The commitment of government to make institutional changes[408] also raises significant cost considerations. Resources are needed for making operational the regulatory incentives brought into being through statutory change. Generally, state resource limitations make the introduction of regulatory innovations quite limited in South Africa.

One other significant consideration too is public perception regarding the relaxation of regulations in certain situations in order to reward environmental performance. If a particular regulatory incentive device is assessed negatively by the public it is unlikely to get political support either. For realism in all cases, regulatory incentives should be used to strengthen the current system by giving it flexibility and streamlining its implementation in the private sector.

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[406] Wilkie "Incentives Canada" (*supra* note 29).
[407] J Davenport 'EIA delay' (2006) *Engineering News* (26) September 8-14 points out that this is a causal factor in the vast backlog in EIA processing.
[408] Institutional changes, according to Wilkie "Incentives Canada" (*supra* note 29), include changing *attitudes* and *operations,* but these are potentially expensive.

5. CONCLUSION

The use of incentive-based instruments combined with a selection of regulations promises advantages in stimulating private biodiversity conservation in South Africa. By hypothesis, incentive levers can evade the compliance and enforcement deficiencies that are evidenced by the traditional approach to biodiversity conservation. The positive features of the newer devices described in this paper include their *flexibility* in design and use; their capacity to elicit *voluntary* action rather than responses to coercion; their promise of more economic *efficiency* in minimising cost or maximising benefit, or gains both ways; their ability to facilitate and promote *innovation*; and, above all, their potential to *offset market failures*, partially or wholly.

If such claims are correct, incentive devices can relieve the regulatory burden imposed on environmental authorities by command-and-control policies. Similarly, the administrative capacity and resource constraints mentioned throughout this paper as facing the authorities charged with environmental protection in South Africa might be relieved by adopting these policy alternatives. In general, these new proposals do not require large allocations of public resources.

Yet it is also evident that while these optional instruments have been presented here as an entire range, some tools are more likely to be useful than others. Certain kinds have been implemented locally on an experimental basis, while others have been applied in limited contexts. So both categories may or may not be feasible to extend. A sub-set exists only prospectively, not yet implemented despite their assessment as promising. Yet a further grouping has proved perverse, in the sense of being as likely to decrease as to advance biodiversity conservation. So although the array of tools *available* in South Africa to influence human choices involving conservation action is comprehensive, considerable scope exists for their refinement and extension in the agenda of policy research.

Given the severity of the biodiversity problem in South Africa and the urgency attaching to remedial action, incentive devices that are judged feasible to implement immediately must merit the most attention. Significant obstructions to use do exist, not only in South Africa but in developing countries in general. For instance, the levels of consumers' environmental awareness and their purchasing power above certain thresholds appear to be prerequisite conditions for information-based incentives to become effective. Similarly, the likelihood of a market developing in South Africa within which tradable resource use rights can be exchanged efficiently is deemed by some commentators[409] to be slim. This stems from the comparatively small size of the country's industrial and commercial sectors. On the other hand, positive arguments can be mounted for using existing markets wherever they appear suitable as implementing mechanisms. In addition, noting the flaws that attach to direct subsidies,[410] tax benefits were examined specifically in this paper to show their potential use in the environmental sphere.

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[409] Stauth *et al* (*supra* note 22) at 44.

[410] *National Treasury Paper* (*supra* note 264) at 89. It is noted that subsidies in general do not conform to the Polluter-Pays Principle, and that their use can lead to significant economic distortions.

In summary, policy innovations exist as hypotheses that promise gains in private biodiversity conservation in South Africa. In principle there is a comprehensive range of instruments available, so the chances of finding a sub-set applicable locally are reasonably high. Refining what is currently on offer in the literature (1) to circumvent foreseeable problems in implementation, as well as (2) to maximise social welfare given the resource and capacity constraints faced by our national authorities, encapsulates the major challenge.

At the present time what is needed is an *integration* of considerations that aim to achieve a complex mix of state objectives that are social, political, economic and environmental in kind. This is formidable. But only if such integration is successful can private conservation be embraced fully in policy formation, so that environmental preservation advances in a sustainable manner on the national scale. This goal is what all environmental disciplines, not the least environmental law, have as their determining impulse.

Appendix 1: Overview of environmentally-related taxes and charges in South Africa (2005/2006)

SECTOR	LEVY (charge)	LEVEL	APPLICATION	TAX RATE
Transport fuels	General Fuel Levy	National	Petrol Diesel Biodiesel	116 cent per litre. 100 cent per litre. 60 cent per litre.
	Road Accident Fund Levy	National	Petrol, Diesel, Biodiesel	36.5 cent per litre.
	Equalisation Fund Levy	National	Petrol, Diesel, Biodiesel	Currently zero.
	Customs and Excise Levy	National	Petrol, Diesel, Biodiesel	4 cent per litre.
Vehicle taxation	*Ad Valorem* Customs & Excise Duty	National	All passenger and light commercial vehicles	Graduated rate based on the vehicle price with an upper ceiling of 20 per cent.
	Road Licensing Fees	Provincial	All registered vehicles	Fees vary between different provinces – usually based on weight.
Aviation taxes	Aviation Fuel Levy	National	Aviation fuel sales	1,5 cents per litre on all fuel sales excluding foreign operators.
	Airport charges	National	Landing, parking, and passenger service charge	Charges imposed to fund the operation of the South Africa Civil Aviation Authority (SACAA).
	Air Passenger Departure Tax	National	International air travel from SA	R120 per passenger; R60 per passenger to BLNS countries.
Product taxes	Plastic shopping bags levy	National	All plastic shopping bags	3 cents per bag.
Electricity	NER Electricity Levy	National	All electricity generated	A levy per kWh is implemented on all electricity generated to fund the National Electricity Regulator.
	Local Government Electricity Surplus	Local	Electricity distributed to end-users by municipalities	Implicit tax rates vary between different municipalities. Total surplus revenue raised is approximately R 1.4 billion.
Water supply	Water Resource Management Charge,	National	All registered water use from DWAF water schemes	Charge rates vary according to different users. The aim is to recover costs associated with water supply and abstraction.
	Water resource development and use of water works charge.	National	All registered water use from DWAF water schemes	Charge rates vary according to different users. The charges aim to recover the costs associated with the construction, operation and maintenance of water schemes.
	Water Research Fund Levy	National	All registered water users	This levy is earmarked to fund the operations of the Water Research Commission.
Waste water	Waste Water Discharge Charge System (proposed)	National framework	All (DWAF) registered water dischargers	The WDCS is in the process of being developed. 2 components are proposed for the system. A cost recovery based charge and a levy/ tax on waste effluent.

Source: National Treasury Paper (*supra* note 287) at 34.

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