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of Wildlife: New International Policy Directions**

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Clem Tisdell

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Clem Tisdell*

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* School of Economics, The University of Queensland, Brisbane QLD 4072, Australia.
E-mail: c.tisdell@economics.uq.edu.au

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For more information: write to Professor Clem Tisdell, School of Economics, University of Queensland, Brisbane 4072, Australia. Email: c.tisdell@economics.uq.edu.au

Economic Incentives for Global Conservation of Wildlife: New International Policy Directions

Abstract

Growing economic globalisation by extending the operation of markets is a two-edged sword as far as nature conservation is concerned. In some circumstances, it threatens the conservation of nature and in other cases, it provides economic incentives that foster the conservation of biodiversity. This article shows how global policy directions have altered in that regard. Initially the World Conservation Union (IUCN) favoured bans on trade in endangered species. This view was enshrined in the Convention on International Trade in Endangered Species (CITES). Subsequently, with the upsurge of support for market-based economic liberalism, IUCN recognised that economic and market incentives, if linked to appropriate property rights, could foster biodiversity conservation. This is reflected in the International Convention on Biological Diversity. While there is conflict between this convention and CITES, its extent has been exaggerated. As explained, in certain cases, trade restrictions of the type adopted in CITES are appropriate for nature conservation whereas the market-oriented policy of the Convention on Biological Diversity can be effective in some different situations. Whether or not the extension of markets in wildlife and wildlife products and growing economic globalisation favours nature conservation varies according to the circumstances.

Economic Incentives for Global Conservation of Wildlife: New International Policy Directions

1. Introduction

Growing economic globalisation in recent decades has been associated with growing global production (an increasing proportion of which is entering international trade) and with expanding levels of foreign direct investment (Tisdell and Sen, 2004). This economic expansion relies on weak conditions for sustainable development rather than strong ones which several scholars believe may be necessary if sustainable economic development is to be achieved (Tisdell, 1999). The current pattern of world development may pose a threat to the conservation of natural and environmental resources, particularly wildlife and threatens the conservation of biodiversity (Tisdell, 2001). Therefore, some environmentalists are concerned about growing economic globalisation as graphically displayed by demonstrations associated with the Millennium meeting of WTO in Seattle (Tisdell, 2004).

However, the views of conservationists about appropriate economic mechanisms for the conservation of wildlife have undergone change and opinions are divided. The dominant view amongst conservationists originally was that trade in wildlife or wildlife products, especially if extended globally would most likely be unfavourable to their conservation. This view is reflected in the Convention on International Trade in Endangered Species (CITES) which came into force in 1975. However, a different perspective has now developed that in various circumstances, international trade in wildlife or wildlife products could actually provide economic incentives for their conservation. This view is reflected in the Convention on Biological Diversity (CBD) which came into force in 1993. Thus, at least, on the surface, there is a potential for serious conflict, between the two international conventions, as for example, emphasised by Swanson (1997, Ch.5).

The purpose of this contribution is to examine the nature of this conflict to consider the extent to which the two approaches to policy can be reconciled and whether together they constitute an adequate approach to conserving global biodiversity. An additional issue considered is why might expanding economic globalisation create a growing problem for conservation of wildlife. However, before going into details, it is worthwhile speculating on why there has been an apparent change in policy perspectives between 1975 and 1993, as reflected in the different conventions, CITES and CBD.

CITES attempts to restrict the operation of market forces to save endangered species whereas CBD aims to foster or harness the use of economic incentives and market forces to conserve endangered species or ones that are vulnerable to endangerment. Each assumes, it will be argued, a different institutional perspective. CBD is based on faith in economic incentives and market mechanisms when combined with appropriate systems of property rights. The philosophy underlying it reflects the resurgence of support for market-based economic liberalism which in itself has been a powerful force for growing economic globalisation.

Let us consider the nature of CITES and the economic rationale behind it, and then the evolution and rationale behind the evolution of the sustainable use/economic incentives approach as reflected in the CBD. This will be followed by concluding comments. These provide a general assessment of the current policy situation.

2. Convention on International Trade in Endangered Species (CITES): Its Nature and Rationale

CITES reflected the dominant strand of thinking about policies for conserving wildlife in the 1960s. It arose from a draft resolution of the IUCN (World Conservation Union) in 1963 but the final version of it was not signed until 1973 and it came into operation in 1975.

In general, and in the absence of exceptional circumstances, CITES bans trade in species of flora and fauna listed in Appendix 1. These are listed on the basis that they are threatened with extinction and that this is or may be exacerbated by trade in those species or their products. Trade in species listed in Appendix II is regulated by the issue of export permits. It is believed that species in Appendix II may become endangered globally if trade is not regulated by the issue of export permits, but they are not necessarily endangered at present. Appendix III species are not necessarily globally endangered but particular countries may be concerned that they will become extinct within their borders if their trade in these species is unregulated. The countries concerned regulate international trade in the species and their products by the issue of export permits.

Much of the responsibility of implementing CITES is in the hands of each of the countries that have acceded to CITES. Such nations may not always enforce the regulations effectively. This they may do knowingly or because of a lack of resources. Thus, a large

illegal international trade in wildlife and wildlife products has emerged. Penalties for non-compliance by nations who have acceded to CITES appear to be absent.

According to CITES regulations, “each country [each signatory to CITES] must designate at least one Management Authority entrusted with issuing permits, and at least one Scientific Authority entrusted with issuing permits, which advises on scientific matters. These authorities together with inspection and enforcement agencies are responsible for ensuring compliance with CITES permit requirements” (Carew-Reid, et al., 2004, p.120).

Swanson (1997, p.96) points out that an Appendix II listing “leaves the decision on trade wholly at the discretion of the exporting state”, and, “these permits are allowed to be issued so long as the exporting state itself certifies that the export will not be detrimental to the survival of the species within the exporting state”. He points out that the system is open to abuse by individual states. This is a problem but let us consider cases in which at least in principle the CITES approach would have merit.

Bans or limitations on trade in commercially valuable wild species can have merit when there is open access to the species or if the members of the species are so mobile or fugitive that *de facto* open access to it occurs. As is well documented in the relevant literature (for example see Tisdell, 1991, Ch. 6, 2005, Ch. 6), an expansion, in demand for members of the species, or products derived from them can, threaten its existence. Such an expansion in demand could be fostered by growing globalisation, which in effect involves market extension.

The problem is illustrated in Figure 1. The supply curve of the harvest of an open-access species is shown by the backward-bending curve marked SE_1E_2S . With restricted markets for the harvest, the demand curve for the harvest might be as shown by the line marked D_1D_1 . Market equilibrium is then established at E_1 . At this level of harvest, the population of the species may not be endangered. However, should demand rise to D_2D_2 , for example, as a result of the process of globalisation, the rate of harvest would initially rise and consequently reduce the population of the species, increase the per unit cost of the harvest, and could endanger continuing existence of the species. In the case shown, an equilibrium is established at E_2 after the expansion in demand to D_2D_2 . However, the population of the species may then be so low that it is considered by scientists to be endangered when the market equilibrium is established at E_2 .

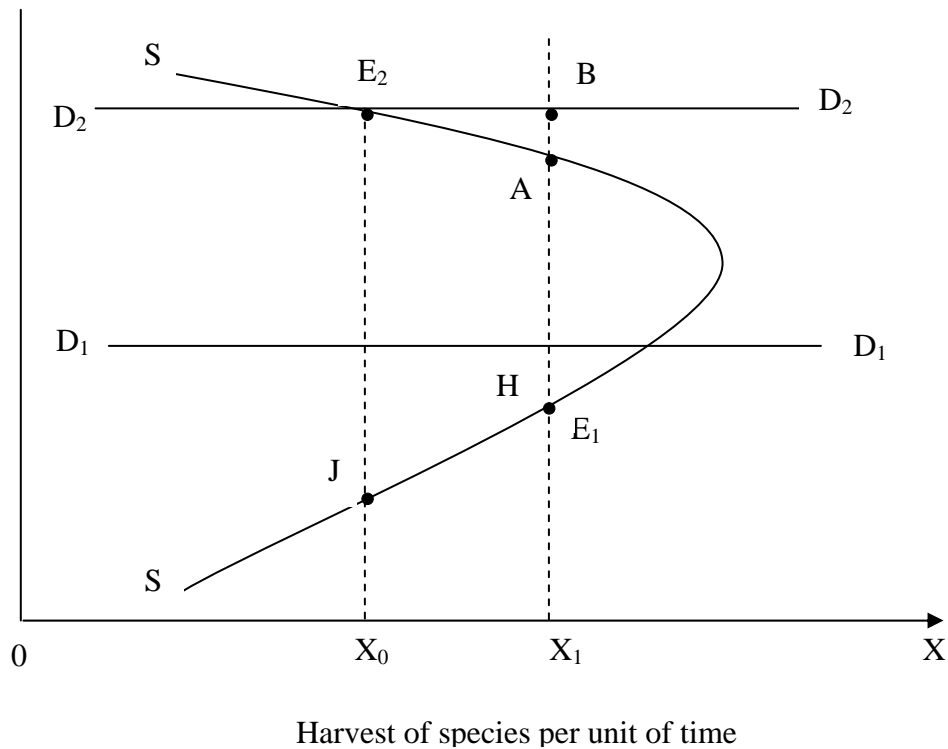


Figure 1: A diagram to illustrate aspects of CITES regulation of international trade to protect endangered or vulnerable wildlife species subject to open-access

To appreciate the problem, it is important to keep in mind the type of population model of the wildlife species that corresponds to the situation illustrated in Figure 1. This is shown in Figure 2. The curve DFG represents the rate of growth of population of the species. If equilibrium E_2 in Figure 1 prevails the rate of harvest of the species is X_0 and under stationary conditions, this corresponds to an equilibrium of E'_2 in Figure 2. The resulting population level of the species is P_0 .

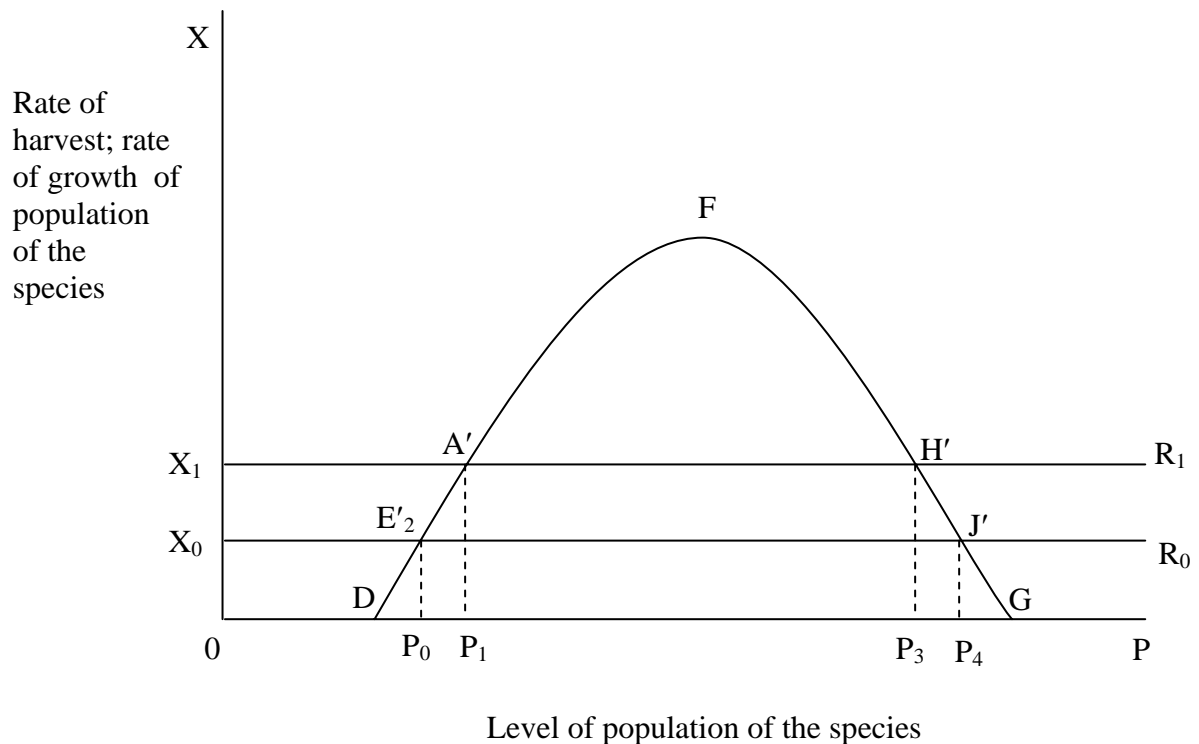


Figure 2: Illustration of the population dynamics of a species underlying Figure 1

Scientists may consider a species to be endangered in equilibrium E_2 in Figure 1 (E'_2 in Figure 2) because there is a risk that the demand curve in Figure 1 will rise above the supply curve thereby resulting in extinction of the species. Or, scientists may consider that there is an unacceptable risk of shocks to the population level of a species at E'_2 in Figure 2, driving its population to a level below D . If this occurs, the population of the wildlife species is unable to recover and it becomes extinct.

Note that a harvest rate of X_0 would be more sustainable if the population level of the species was allowed to recover to P_4 rather than being held at P_0 . Furthermore, the cost of the harvest of X_0 would be lower. Recovery to P_4 could be achieved by initially holding the allowable harvest rate at less than X_0 , and subsequently, increasing it to X_0 when a population level of P_4 is achieved. The harvest need not be held initially at zero.

However, the policies adopted under CITES have often been 'stop-go' policies. For example, total bans on trade in endangered wildlife species are followed by their relaxation when they

are more abundant. This is a human unfriendly approach because it denies for a period of time livelihood to those individuals depending on commercial use of a focal species for their income.

Suppose that scientists believe that a minimum population of the focal wildlife species of P_1 is necessary for it not to be endangered. If initially the market equilibrium is at E_2 and the population level of the species at P_0 , recovery to P_1 can be achieved by limiting the allowable harvest of the species to less than X_0 . The speed of convergence to P_1 will be faster the lower is the initially permitted harvest but the degree of social economic disruption will also be greater. Once P_1 is reached the allowable harvest can be raised to X_1 .

However, a population level of P_1 of the species is not ideal from an economic point of view. A population level of the species of P_3 would be more economic since it will result in a lower cost of a harvest of X_1 , that is, in a per-unit cost of an amount corresponding to H rather than A in Figure 1. This could be achieved by keeping the rate of allowable harvest below X_1 until population recovers to P_3 . This may also make the survival of the species more secure than if its population level is P_3 . However, the policies of CITES do not take account of this economic aspect.

Note that market regulation of trade in an open-access commodity tends to encourage the development of black markets, and illegal operations. Regulation of trade in wildlife is not an exception.

The economic incentive for black market operations can be illustrated by Figure 1. Should the allowable harvest and trade in the focal wildlife species be restricted to X_1 when there is a corresponding population level of P_1 , the gap between the demand price and the supply price is equivalent to AB . This provides scope for bribery and illegal market transactions. The gap is much larger when the level of population of the species is P_3 and only a harvest rate of X_1 is allowed. In Figure 1, this gap is equivalent to the distance HB , and economic incentive for illegal market operations are even greater than when the level of population of the species is P_1 .

Whether or not illegal market operations will negate the benefits of market regulation in such cases depends on the circumstances. Factors such as the cost of policing and monitoring

compliance would need to be taken into account. The occurrence of some illegal practices does not in itself imply the absence of a net social benefit from market regulation.

In practice, it is not economic to make all wildlife resources private or communal property. Thus some wildlife can be expected to remain an open-access resource unless its use is regulated by the state. Market regulation has a role in conserving such resources and in ensuring their economical use. While CITES' regulations and policies have not addressed the issues involved in an ideal manner, there seems little alternative to market regulation as a means to conserve commercially valuable open-access species and ensure their economical use. However, a different set of policy approaches are relevant when species can be made, or are private property, communal property or even in some cases, state property, and are commercially valuable. New approaches to global wildlife policy concentrate on such cases.

3. Market and Economic Incentives for Nature Conservation – New Policy Directions as underlined by the Convention on Biological Diversity

As mentioned above, CITES resulted from a resolution of IUCN passed in 1963. As time passed, however, IUCN began to alter its policy stance. *The World Conservation Strategy* (IUCN-UNEP-WWF, 1980) was still relatively supportive of the regulated market approach but showed growing interest in the use of economic incentives for nature conservation. In particular, it stressed how nature-based tourism in developing countries might provide them with economic rewards and incentives for nature conservation. It was, however, *Caring for the Earth: A Strategy for Sustainable Living* (IUCN-UNEP-WWF, 1991) that marked a watershed in IUCN thinking in that it strongly advocated greater use of economic incentives, economic mechanisms, and markets as a means to encourage nature conservation. This seems to have partly reflected the position of Martin Holdgate, the then Director-General of IUCN and it is claimed to have influenced the outcome from the United Nations Conference on Environmental and Development held in Rio de Janeiro in 1992 and the subsequent Convention on Biological Diversity (Adams, 2001, p.70).

Caring for the Earth (IUCN-UNEP-WWF, 1991, p.69) states “Economic policy is also an essential instrument for achieving sustainability. Economic instruments are also valuable tools for the establishment of sustainable practices because they provide a strong incentive force, while leaving individuals and industries freedom of choice about the precise measures they adopt”.

It mentions elsewhere (IUCN-UNEP-WWF, 1991, p.42): “Incentives to use natural resources sustainably depends on the property rights of users... Exclusivity, duration and other characteristics of property rights profoundly influence the incentives of users to conserve resources”. While this is true, it should also be pointed out that property rights (private, commercial or state) are not sufficient to ensure the conservation of wildlife species, even though they can do so. For example, if economic returns from cattle grazing are higher than from utilisation of wildlife in a land area, there is an economic incentive to convert the area to cattle grazing to the likely detriment of some wildlife species present on the land. Comparative returns from alternative economic activities on a land area have a major influence on whether or not wildlife on that land will be conserved. In some cases, even when landholders can appropriate all the total economic value of wildlife on their land, they find that the returns from the utilisation of the wildlife are lower than from other economic alternatives. They then have an incentive to dispense with the wildlife (Tisdell, 2004b). However, on other occasions, the ability to appropriate economic returns from wildlife can tip the balance in favour of its conservation.

It is probably the latter situation that framers of *Caring for the Earth* had in mind when they stated “Economic return to local communities is important. Those that successfully conserve wildlife stocks should be enabled to export the sustainable surplus and to receive the revenue as earned” (IUCN-UNEP-WWF, 1991, p.42).

In any case, the sustainable use; sustainable commercial utilisation theme increasingly dominated international thinking about conservation policy in the 1990s and beyond. Swanson (1997, p.61) points out that in the 1990s that there was a growing recognition by major conservation groups that “resource conservation must be built around the interests of the individuals, communities and governments most concerned” and that economic incentives are important in international conservation of nature.

The Convention on Biological Diversity reflects this outlook. It emphasises the importance of giving property rights to states and ultimately to local communities, individuals and so on in genetic resources. Its main objective, as quoted by Swanson (1997, p.81), is “the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources” (Article 1). However, implementing this convention is not as easy as setting out the principles. For one

thing, the establishment and enforcement of property rights is not costless. Secondly, sustainable use of wildlife (especially commercial use) is not always a viable economic option for wildlife conservation. Third, there are conflicts with CITES to be resolved. As pointed out in the previous section, there are some cases, where the best conservation policy involves restricting trade in wildlife and wildlife products rather than encouraging their marketing. The need for judgement in this respect complicates policy implementation.

4. Concluding Discussion

There appears to have been global swings in feelings about appropriate policies for conserving wildlife and biodiversity. The most significant change in recent decades has been a change from emphasis on international policies to restrict trade in wildlife as a conservation measure to one of encouraging trade and establishing property rights in wildlife. However, a blanket approach to global conservation policy is inappropriate for reasons outlined in this essay.

The ideal global conservation policy is likely to consist of an array of very different policies – some that rely on greater use of market mechanisms to appropriate economic gains from wildlife conservation, some that restrict the use of market mechanisms, and some that do not use market mechanisms at all. The latter may include national parks and protected areas from which very little of their total economic value can be economically appropriated by the landholder. Such environmental resources may be provided by the state or by NGOs.

The above pattern is not inconsistent with the view that bans on commercial use of wildlife can sometimes be detrimental to its conservation. It is likely, for example, that bans on the ivory trade in the 1980s adversely affected those African states that used revenues from this trade (eg. South Africa and Zimbabwe) to foster their nature conservation efforts (Swanson, 1997).

In recent decades, there has been a new flush of excitement about the possibility that greater use of market mechanisms can provide spectacular benefits. There has been a resurgence of market-based economic liberalism. It is associated with growing economic globalisation. Social movements for conserving nature and biodiversity have not been immune from the influences of the resurgence of market-based economic liberalism, as this essay demonstrates. While that may be healthy, there is also a danger of ascribing powers to market mechanism

that are unrealistic in some cases. Even with concerted efforts in market-making, we should recognise that some market failures can be expected to continue to exist. This is particularly evident for the conservation of those wildlife species that have high total economic value which consists mainly of non-use value. The latter component is in effect a pure public good component that cannot be marketed. Some wildlife species may also remain *de facto* open-access resources because it is too costly to make them private property, or even for the state to manage these resources effectively.

While growing globalisation may create greater economic opportunities for higher economic benefits from the conservation of wildlife and its commercial utilisation, it heightens the degree to which some wildlife species are endangered. Effective international conservation policy involves the difficult task of distinguishing between these situations. Doing this is a complex matter. There is a need for better appreciation of this complexity in international fora and return to a more balanced view about the potential of market and economic mechanisms to achieve socially desirable results.

References

- Adams, W. M. (2001). *Green Development: Environment and Sustainability in the Third World*, 2nd edn, Routledge, London.
- Carew-Reid, J.; Briggs, D.; Hockings, M.; Beeton, B. and Davis, J. (2004). *ENVM 7505 International and National Conservation Policy: Study Book*. Teaching and Educational Development Institute, The University of Queensland, Brisbane.
- IUCN-UNEP-WWF (1991). *Caring for the Earth: A Strategy for Sustainable Living*, IUCN, Gland, Switzerland.
- IUCN-UNEP-WWF (1980). *The World Conservation Strategy: Living Resource Conservation for Sustainable Development*, IUCN, Gland, Switzerland.
- Swanson, T. (1997). *Global Action for Biodiversity: An International Framework for Implementing the Convention on Biological Diversity*, Earthscan, London.
- Tisdell, C. A. (1999). "Conditions for Sustainable Development: Weak and Strong". Pp. 23-36 in A. K. Dragun and C. Tisdell (eds). *Sustainable Agriculture and the Environment: Globalisation and the Impact of Trade Liberalisation*, Edward Elgar, Cheltenham, UK.
- Tisdell, C. A. (1991). *Economic of Environmental Conservation*, Elsevier, Amsterdam.

- Tisdell, C. A. (2001). "Globalisation and Sustainability: Environmental Kuznets curve and the WTO", *Ecological Economics*, **39**, 185-196.
- Tisdell, C. A. (2004a). "Globalisation, Labour and Environmental Standards: Globalisation with Reference to India". Pp. 87-105 in C. A. Tisdell and R. K. Sen (eds.) *Economic Globalisation: Social Conflicts, Labour and Environmental Issues*, Edward Elgar, Cheltenham, UK.
- Tisdell, C. A. (2004b). "Property Rights in Non-captive Wildlife and Biodiversity, Conservation, *International Journal of Global Environmental Issues* (in press).
- Tisdell, C. A. (2005). *Economics of Environmental Conservation: Second Edition*, Edward Elgar, Cheltenham, UK. (In press).
- Tisdell, C. A. and Sen, R. K. (2004). "An Overview of Economic Globalisation: Its Momentum and its Consequences Examined". Pp. 3-25 in C. A. Tisdell and R. K. Sen (eds.) *Economic Globalisation: Social Conflicts, Labour and Environmental Issues*, Edward Elgar, Cheltenham, UK.

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