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Review

CITES, sustainable use of wild species and incentive-driven conservation in developing countries, with an emphasis on southern Africa

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ABSTRACT

Over 30,000 species of animals and plants that are, or may be, detrimentally affected by international trade are listed on the Appendices of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). The Convention aims to regulate transboundary trade in species and their derivatives through a system of permits and certificates, and to ensure that such trade conforms to the principle of sustainability. In the developing world, a considerable component of its biodiversity lives outside protected areas where governments have limited potential to manage wildlife. Based on selected vertebrate and plant species, this paper concludes that: (1) use of wildlife in developing countries is more likely to be an imperative rather than a choice; (2) the legal instruments of CITES have limited capacities to ensure that international trade is sustainable; (3) sustainable use of species is best achieved by gaining the support of affected local communities; (4) community support can be maximized by the devolution of ownership or user rights of species from the state to, e.g., the communal level, and the development of effective economic incentive structures to prevent alternative land-use strategies; (5) countries in southern Africa have pioneered devolution of ownership/user rights to the district/communal level; (6) in combination with effective CITES trade controls, trade opportunities, rather than trade restrictions, are most likely to assist in the development of incentive-driven conservation strategies; (7) to avoid negative incentives and to increase awareness of livelihoods, the international CITES community may need to consider whether CITES Appendices I and II listing decisions should be based not only on biological/trade criteria but also on socio-economic considerations, if it is in the conservation interest of the species concerned; (8) a strategic cooperation with the Convention for Biological Diversity (CBD) could improve strategies for sustainable trade; (9) while incentive-driven conservation can provide significant longer-term potential for the protection of animal and plant species, it may be most difficult to achieve for species whose high-value products have a long tradition in medicinal use and (10) the conditions under which incentive-driven conservation is most likely to promote sustainable use need to be clearly identified.

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1. Introduction

The recognition in the 1960s that international trade might pose a growing threat to many wild species stimulated a 1973 Plenipotentiary Conference in Washington DC, that resulted in the CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) coming into effect in 1975. CITES is the largest multilateral agreement on species conservation and regulates international trade in more than 30,000 species of animals and plants through a system of reciprocal permits and certificates (http://www.cites.org/eng/disc/species.shtml). In CITES, species are listed in Appendices which subject them to different levels or types of trade controls to avoid over-exploitation (Table 1). The CITES Appendices I, II and III broadly correspond to the Annexes A, B and C of EU Wildlife Trade Regulation No. 338/97, by means of which CITES is implemented in the European Union (Cooper and Rosser, 2002; Wijnstekers, 2006). With its 174 member states and legal instruments to enforce compliance (Reeve, 2006; Sand, 2006), CITES is probably the most important global Convention for the protection of species, despite its outspoken critics (e.g. Hutton and Dickson, 2000, pp. 29–37).

Conservation in Africa is a subject which, since Grzimek and Rewald's bestseller *Serengeti shall not die* (1961), has moved people world-wide. A heritage of Grzimek and Rewald is a common view of the Western world, not always beneficial to species conservation, that wildlife populations are threatened everywhere in Africa, and that the only justified way of their utilization is non-extractive use such as photo tourism. While in many African regions, especially Western and Central Africa, wildlife populations have almost disappeared, threats that Africa's populations of wildlife would become almost completely extinguished within a rather short time have proved unfounded, and the southern African region is a good case in point (e.g. IUCN, 2007).

Effective species conservation is essentially based on the concept of "sustainability". While CITES lacks its own definition of "sustainability", Article IV of the Convention states in this context that removal of a specimen for trade does not adversely affect the conservation status of that species or the range of the population (Wijnstekers, 2006; Table 2). This is an implicit recognition of the sustainability concept (Hutton and Dickson, 2000, pp. 47–56). Nevertheless, the concept of the sustainable use of species has been hotly contested within CITES since its inception, particularly through the influence of politically powerful NGOs with an agenda that focuses on the protection of individual animals rather than on species (Carey, 1999).

Because many of the provisions of the Convention dealing with sustainable extractive use were originally developed for southern African species of large mammals and reptiles, these will provide the primary focus of this review to highlight some of the successes that CITES, partly through incentive-driven conservation, has had

Table 1
CITES Appendices.

Appendix	Content
I	Species that are threatened with extinction and CITES prohibits international trade except when the purpose of the import is not commercial (e.g. most hunting trophies, parts and derivatives such as carved products as tourist souvenirs). In these exceptional cases, international trade may take place on the basis of permits
II	Species that are not necessarily now threatened with extinction but that may become so unless international trade is closely controlled. Trade permits are only granted if certain conditions are met, above all that trade is not detrimental to the survival of the species in the wild (Article IV of the Convention, and Article 4 of the EU Wildlife Trade Regulation No. 338/97)
III	Species that are included at the request of a Party that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation

Table 2
Relevant Articles of the CITES Convention and of the EU Wildlife Trade Regulation No. 338/97 that are referred to in the text.

Article	Content
CITES Article IV	Trade of a specimen of a species included in Appendix II may only take place if it is not detrimental to the survival of the species and its population in the wild. That the trade is non-detrimental has to be certified by the relevant Authority of the exporting country
CITES Article XIV	The Convention does not affect the right of Parties to adopt stricter domestic measures regarding the conditions for trade of specimens included in Appendix I and II, or their complete prohibition of trade
Article 4 of EU Regulation No. 338/97	Trade in specimens of Appendix II species may only take place if that trade is not detrimental to the survival of the species or its population in the wild. That the trade is non-detrimental has to be certified by the relevant Authorities of the exporting countries *and* by the importing countries of the EU

in using and trading endangered species within sustainable levels. The paper also examines the economic incentive these species can play in their conservation through local communities in the extensive areas outside of protected areas in southern Africa, it discusses relevance of the incentive-driven community-approach to other species and regions, and addresses future developments of sustainable use within CITES.

2. Terminology

Perceptions differ as to what the terms *use, sustainability* and *incentive* mean when referred to under the umbrella term of *sustainable use* (Hutton and Leader-Williams, 2003). It therefore seems appropriate to clarify terminology used in this paper.

In the developing nations, use of wild-living natural resources by rural communities is rarely a choice but an economic imperative. Further, use can either be extractive or non-extractive. Extractive use may be lethal (e.g. through trophy hunting, logging, etc.) or through the collection of parts and derivatives without affecting the survival of the specimens involved (e.g. plant products). Non-extractive use refers to all varieties of nature-based tourism. Given the economic circumstances for affected rural communities, a distinction between whether use of species is primarily subsistence or for primarily commercial purposes is largely inseparable and this paper therefore does not attempt to make such a distinction.

CITES' understanding of the concept of sustainable use, as described in Article IV of the Convention, lacks reference to a social component of use. In the context of incentive-driven conservation, sustainable use is seen here as in Article 2 of the Convention on Biological Diversity (CBD), namely "the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations" (Secretariat of the Convention on Biological Diversity, 2005).

The term *incentive-driven* conservation is underpinned by Article 11 of the CBD, which states that "Each contracting party shall as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biodiversity" (Secretariat of the Convention on Biological Diversity, 2005). This explicitly recognizes the potentially important role that use of natural resources can play as an economic incentive for local communities to actively preserve species and their habitats in developing nations. Economic benefits/gains are incentives that encourage local communities to use natural resources sustainably, and they can involve both extractive or non-extractive uses. If extractive use aims to create financial benefits to communities to sustainably harvest resources, incentives must be adequate to off-set direct and indirect costs to communities living with wildlife (e.g. crop loss due to elephant activity; Osborn and Parker, 2003). Financial compensation through national governments to counter land-uses that are detrimental to species conservation can also be seen as a form of incentive-driven conservation strategy. The level of economic incentives to communities and conservation are linked to a variety of factors, the most important of which is the extent to which local communities are given legal ownership or user rights over natural resources (Child, 1995).

The term *local* communities refers to those that are both historically indigenous to an area, as well as those that have settled there at a later date.

3. Distribution of species and sustainable use

The greater part of global biodiversity occurs in the tropical and subtropical regions, and thus in the developing countries of the southern hemisphere where, in the mostly colonial and post-colonial past, protected areas like national parks and reserves were the pillars of species conservation. However, their functionality in many developing countries is now preserved only on paper: first, because due to lack of funds, national parks and other protected areas often can no longer fulfil the mandate of protection, and second because they are increasingly under pressure from rural populations living along the boundary perimeter and who rarely draw economic advantages from the protected areas and thus have little incentive for their maintenance (Child, 2004; Cumming, 2004). The extensive multi-purpose managed areas outside protected zones are now becoming increasingly important from a conservation point of view. But, significantly, these regions also form the basis of life of the local communities which share natural resources with species of wildlife. In southern Africa, some 80% of the potential elephant range is outside protected areas, and in Botswana, 60% of its approximately 150,000 elephants live outside protected areas during the rainy season, the period of greatest threat to the fields of subsistence farmers. In Zimbabwe, some 10,000 elephants reside in communal lands (Cumming and Jones, 2005). Use of species by rural communities is traditional and widespread and is an imperative rather than a choice (Roe et al., 2002; Roe, 2008). The issue is thus not one of attempting to stop use, but to turn unsustainable systems into sustainable ones.

Over the mid-to long term species conservation can thus only be successful if it considers the elementary needs of the local rural communities in developing countries, which are the majority. Taking account of different cultural values, it is within the autonomy of the countries concerned to decide how these resources should be used in a sustainable manner. The development of sustainable types of use as economically compatible alternatives to other forms of land-use (e.g. clearing for agricultural purposes) have the potential to contribute significantly to the preservation of species. In particular with respect to some of the larger vertebrates of southern Africa, this includes diverse strategies of utilization, both non-extractive (nature-based tourism) and extractive such as trade in wildlife products and derivatives or lethal extraction through hunting tourism, which is of considerable economic importance not only to many southern African nations but also to industrial countries of Europe (Swanson and Barbier, 1992). Where renewable natural resources lose value to the legal resource user due to a CITES trade ban or trade restriction, as has happened, for example, in the case of the leopard or cheetah (see below), investment in their populations and habitats by landowners will be stifled and affected species are likely to be considered competitors with livestock and their habitats used for agricultural purposes, with obvious impacts on wildlife populations (Swanson, 1992; Carey, 1999). In contrast, a CITES trade ban may often significantly *increase* the value of products and derivatives of affected animal species (Hutton and Dickson, 2000; Rivalan et al., 2007).

In recent years a connection between poverty and biodiversity loss (e.g. species diversity) has become increasingly obvious. The 2010 Target of the Convention for Biological Diversity (CBD) aims at significantly reducing the global biodiversity loss by 2010 – as a contribution to poverty reduction and to improve the quality of life for all people living on earth (CBD CoP6, Decision 26, 2002). The awareness of a positive relationship between biodiversity loss on the one hand and poverty on the other was expressed also in a Statement of the secretariats of the five major biodiversity-related conventions at the World Summit on Sustainable Development (Johannesburg, Republic of South Africa, 2002) – CITES (international trade), CBD (biodiversity and sustainable development), RAMSAR (wetlands), CMS (conservation of migratory species of wild animals) and WHC (World Heritage Centre): "Biodiversity can indeed help alleviate hunger and poverty, and can promote human health, and be the basis for ensuring freedom and equity for all". Biological resources therefore represent economic resources

Table 3
Summary of important developments within CITES that reflect the Convention's growing recognition of the concept of the sustainable extractive use of wild species as a conservation instrument, particularly the larger mammals and reptiles of southern Africa. CoP, Conference of the Parties; Res. Conf., Resolution Conference.

CoP	Year	Species/issue	Event
2	1979	Crocodilians	Recognition by importing nations in the developed world that exporting countries be given the opportunity to profit from controlled trade in Appendix I species. This resulted in Conf. Res. 3.15 (CoP3 1981) which permits down-listing of Appendix I species for commercial use using the "ranching criteria" (succeeded by Res. Conf. 11.16 rev. CoP14)
4	1983	Leopard	Res. Conf. 4.13 recognizes that specimens of leopard can be killed for the benefit of conservation of the species
5	1985	All species	Res. Conf. 5.21 allowed the systematic down-listing of populations
8	1992	All species	Res. Conf. 8.3 argues that commercial trade can benefit the conservation status of a species
10	1997	Elephant	Elephant populations of Botswana, Namibia and Zimbabwe were down-listed to Appendix II, coupled with approval of one-off sale of 50 tons of raw ivory from Botswana, Namibia and Zimbabwe
11	2000	Elephant	Elephant population of South Africa was down-listed to Appendix II
12	2002	Elephant	Conditional approval of one-off sale of 60 tons of raw ivory by Botswana, Namibia and South Africa, linked to criteria set out in Res. Conf. 10.10 (rev. CoP12)
13	2004	Elephants	Amended annotation allowing Namibia to trade in individually marked and certified ekipas (traditional ivory carvings) incorporated in finished jewellery for non-commercial purposes
		Livelihoods	Res. Conf. 8.3 ("Recognition of the benefits of trade in wildlife") was supplemented with a paragraph linking CITES implementation decisions with the need to consider impacts on poor people in affected communities
14	2007	Livelihoods	Establishment of a Working Group to develop a process to evaluate CITES impacts on the livelihoods of the poor
		Elephant	■ Approval of the one-off sale of raw ivory to Japan and China conditionally agreed to at CoP12 ■ A consolidated Annotation for Appendix II populations of the African elephant, including an additional tonnage in raw ivory to that conditionally agreed to at CoP12, and a nine-year resting period in raw ivory trade following the agreed one-off sale
		CITES Strategic Plan 2008 – 2013	Recognition that CITES, through sustainable use of species and in conformity with the 2015 goal of the UN, can and should make a significant contribution to economic concerns of developing nations

which can play an important role in the fight against poverty (Secretariat of the Convention on Biological Diversity, 2005).

4. Innovative approaches within the Convention

The original Treaty was designed to minimize international trade which was viewed as a major threat to many wild species. As such, it had no mechanism to deal with the concept of sustainable extractive use of species, especially lethal extraction, indeed the concept was strongly contested. This is despite the fact that trade in Appendix II species requires assurance on the part of the exporting country that such trade has no detrimental effect on the species concerned (see below). However, while CITES remains predominantly concerned with intervention mechanisms to control trade rather than positive measures to facilitate sustainable trade, CITES member States now expressly recognise sustainable extractive use of species as a potential means for their protection. Table 3 provides a selection of decisions which the Convention and its Parties have taken in this regard. The majority of these decisions were initiated, or were significantly influenced, by the developing countries of southern Africa, particularly Namibia, South Africa, Botswana and Zimbabwe. Furthermore, by supporting the wider, not necessarily contradictory, objectives of the Millennium Development Goals (CITES Resolution Conf. 14.2, 2007), the Convention reaffirms its support for sustainable use not only as a strategy to achieve biodiversity conservation but also of poverty alleviation goals.

Larger vertebrates have clearly been central in sustainable use discussions with regard to CITES in southern Africa. However, the most publicised case to link species protection with economic interests of local communities, and hence poverty alleviation, has involved two plant species of the genus *Harpagophytum* (*H. procumbens, H. zeyheri*). The species range across most arid zones of southern Africa and have been used in traditional medicine but with an increasing international market that potentially threatens their long term persistence (Marshall, 1998). However, a proposal to list the species on CITES Appendix II at CoP11 (2000) was withdrawn because of range states' concerns for potential losses in income from the species derived by local people. Nevertheless, expectations that the species may well be listed at a later stage may have increased unsustainable exploitation (Rivalan et al., 2007). What the proposal to list *Harpagophytum* has achieved within CITES, however, is a raised awareness of the link between poverty and conservation, and an addition to CITES Resolution Conf. 8.3 rev. CoP13 in 2004 ("Recognition of the benefits of trade in wildlife"), namely that the "implementation of CITES-listing decisions should take into account potential impacts on the livelihoods of the poor" (Table 3). CoP14 (2007) established a working group to develop strategies to avoid detrimental implementation effects of CITES listing on the income of local communities. This provides a clear linkage to UN Millennium Development Goals 1 (poverty reduction) and 7 (ensuring environmental sustainability).

While it is now generally recognized that sustainable use can play a significant role in the protection of CITES-listed species, such as through incentive-driven conservation strategies, the Convention has limited capacities to ensure that trade is sustainable. It depends to a significant degree on the ability and willingness of exporting countries to trade in quantities that are not detrimental to the survival of affected species.

5. Problems in facilitating sustainable utilization

5.1. General

A trade agreement can only be an effective control instrument (*sensu* CITES) if the perspectives of both the purchasing and the producing countries are understood, respected, and integrated into national trade policies. If one side of the trade agreement (purchaser or producer) is forced into playing a subordinate role in the development of trade provisions, the agreement is likely to fail. Currently, Parties in developed countries vote on issues which affect the income of developing countries whilst carrying no responsibility for the costs of conservation in affected countries. It is thus crucial in a CITES context to respect the sovereignty of other member States to determine themselves the conservation strategy they wish to apply in their national territory, including sustainable extractive use.

In its original conception CITES was a product of the northern hemisphere where western cultural values contributed to the general belief that listing a species on the Appendices is a triumph for conservation and that trade bans are inherently a good thing for conservation (Hutton and Dickson, 2000, pp. 3–12). An understanding of various potential effects of listing a species on the CITES Appendices, and of the circumstances governing these countries is improving, however, with many purchasing countries now showing greater appreciation for the reality of species conservation in developing nations. This is reflected in corresponding applications submitted at Conferences of the Parties, and the outcome of the voting process regarding these applications. But this comprehension of the *north vs. south* problem has only marginally found its way into practice. Many developing countries with high biodiversity levels, and hence many CITES-listed species, generally (a) lack adequate resources to effectively implement the Convention through its national Management, Scientific and Enforcement Authorities, and (b) are characterized by rural communities with no or inadequate benefits from wildlife conservation, and hence no or inadequate incentives for their protection.

Limited capacities to effectively implement the Convention applies particularly to plants because of their traditionally lower profile within CITES, despite the fact that six times more plant than animal species are listed on CITES Appendix II (http://www.cites.org/eng/disc/species.shtml). But the urgent need for the listing of plant species on Appendix II is increasingly recognized, and this is reflected in the quite recent listing of, for instance, *Hoodia* spp., *Prunus africana* (African cherry), *Taxus* spp. (Yew), *Pericopsis elata* (African teak), *Caesalpinia echinata* (Brazilwood), *Gonystylus* spp. (Ramin) and *Swietenia macrophylla* (Bigleaf mahogany). The increasing rate and attention of CITES plant listings can be expected to be maintained, which should strengthen appropriate capacities within developing nations.

Affordable access to training and education courses on CITES implementation for personnel from developing countries (like the Master's Course on "Management, Access and Conservation of Species in Trade" at the University of Andalusia in Spain; see CITES CoP14 Inf. Doc. 4, 2008) provides significant ongoing capacity enhancement. But capacity limitation and implementation deficits within the CITES Management, Scientific and Enforcement Authorities is not limited to the developing world and is evident also within some member states of the European Union. The latter is reflected in the content of Commission Recommendation No. 2007/425/EC (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007H0425:EN:NOT).

Effective implementation and enforcement of CITES is also a question of political will and having appropriate national CITES legislation in place (Resolution Conf. 8.4 rev. CoP14, 2007). African countries in general score particularly poorly in terms of quality of governance and corruption (http://www.transparency.org/policy_research/surveys_indices/gcb/2007), and Table 4 highlights inadequacies in the quality of national legislation in most African countries south of the Sahara. In interpreting legislative inadequacies, particularly those that do *not* meet the requirements of CITES (Category 3), consideration must be given, however, to the fact that in several affected countries, lack of basic resources and/or prolonged civil war seriously impedes the development of appropriate implementation and enforcement capacities. Further, inadequate national legislative qualities are not confined to sub-Saharan Africa but apply also to many countries in Central and South America and Asia (CITES CoP14 Doc. 24, 2007).

In addition to capacity limitation within national CITES authorities, and national legislative inadequacies, local communities in politically unstable developing countries remain largely excluded from trade profits, which hampers enforcement and sustainable use practices. Rich, industrialized countries cannot expect morally/ethically based species conservation strategies to be implemented in developing producer countries. The divergence between the costs of species conservation and, alternatively, the profit from agricultural use is accounted for neither by the industrial countries nor by the Convention. It is, however, recognized, that the relative costs and benefits of different forms of land use may vary from context to context.

Table 4
The quality of national CITES legislation in African counties south of the Sahara (Source: CITES CoP14 Doc. 24, 2007).

Country	Category of national legislation
Benin	2
Botswana	2
Cameroon	1
Congo	2
Democratic Republic of the Congo	1
Equatorial Guinea	2
Ethiopia	1
Gabon	2
Gambia	2
Ghana	3
Guinea	2
Guinea-Bissau	3
Kenya	2
Lesotho	3
Malawi	2
Mali	2
Mozambique	2
Namibia	2
Rwanda	3
Sierra Leone	3
Somalia	3
South Africa	2
Uganda	3
United Republic of Tanzania	2
Zambia	2
Zimbabwe	1

Category 1: legislation which is believed to generally meet the requirements for implementation of CITES.
Category 2: legislation which is believed generally not to meet all requirements for the implementation of CITES.
Category 3: legislation which is believed not to meet the requirements for the implementation of CITES (CITES CoP10, Doc. 10.31, 1997).

5.2. Practical aspects in the implementation

The concept of the Appendices and the associated trade regulations is potentially problematic with respect to sustainable use.

5.2.1. CITES Appendix II and Article IV of the Convention

Species listed in this Appendix may be traded only if the requirements of CITES Article IV are met, namely that scientific authorities in the *States of export* certify that an export will not be detrimental to the species or population concerned (Table 2). However, this provision is open to abuse because exporting countries may, wittingly or unwittingly, allow trade in some Appendix II species despite detrimental effects on the species or its populations (Rosser and Haywood, 2002). The problem of the implementation of Article IV is not exclusively, but primarily, one of the developing countries.

To counteract this potential problem in the European Union, one of the three largest consumer markets (the others being the USA and Japan), Article 4 of EU Regulation No. 338/97 provides for stricter domestic measures (SDM) for the trade in specimens of species listed in Appendix II by requiring that the sustainability of trade has to be certified by a scientific authority not only in the State of export, but also in the importing State of the European Union (Table 2). This involves a consultation process between

exporting and importing countries and can potentially avoid the necessity of unilateral trade bans.

It may be assumed, that where doubt over the sustainability of a trade transaction has been raised by, e.g. the European Union, many developing countries may lack the scientific know-how to convince either member States of the European Union, or the European Commission, of the sustainability of the transaction. Here the European Commission should, maybe partly within the framework of the Scientific Review Group (SRG), develop a long-term strategic solution where relevant countries are sufficiently informed about import requirements and, where necessary, to support training national CITES staff so that trade bans can be avoided as far as possible.

Being aware of the Appendix II/Article IV problem, the Convention has taken two steps to counter non-sustainable trade:

(i) In Article XIV, the Convention does not affect the right of individual Parties to unilaterally impose stricter trade conditions on states of export, and the USA and the EU, for example, make use of this provision (Morgan, 2002; Table 2). At the multilateral level, a temporary trade ban may follow a recommendation by the Standing Committee, for particular specimens or products for something which CITES had agreed that trade in them was permissible. This collective application of each Party's right to take stricter action under Article XIV results in a series of temporary multilateral trade bans which have, in the vast majority of cases, achieved compliance in the past (Reeve, 2006; Sand, 2006).

Because the effectiveness of a CITES trade ban is to a large degree influenced by costs of enforcement and conservation budget, a trade ban generally affects countries with different levels of financial investment in species conservation. Trade bans, however, may prove counterproductive both to species conservation and to the accompanying economic aspects for local communities (Hutton and Dickson, 2000, pp. 47–56, 57–66). It may also affect the integrity of a multilateral approach to resolving issues within CITES. The trade ban on the part of the USA on products made of the Nile crocodile (*Crocodylus niloticus*), particularly of Zimbabwean origin and for 13 years after CITES agreed that international trade was permissible, is a good case in point. The trade ban was widely perceived by industry as a convenient trade barrier by the US Government to protect local US products made of alligator leather from off-shore competition.

(ii) Via the so-called "Significant Trade Review Process" the CITES Animals or Plants Committees, in cooperation with the Secretariat and competent experts, review on a case-by-case basis biological and trade data of threatened species listed in Appendix II (Resolution Conf. 12.8 rev. CoP13, 2004). This generally results in the CITES Secretariat ordering field studies to collect the required information, which later form the basis of regulatory trade provisions up to a total trade ban for an exporting country where Article IV provisions are contravened. Ideally, the Significant Trade Process, which contains an element of consultation between the Secretariat and individual exporting countries, should avoid the need for trade bans. An important problem of the *Significant Trade Review Process* is the lack of funds for the necessary case studies (Hutton and Dickson, 2000, pp. 47–56).

5.2.2. CITES Appendix I

Appendix I species are critically endangered (threatened with extinction) and are thus largely excluded from commercial use (trophy hunting is not affected). However, an Appendix I listing may push trade underground.

Many developing countries lack good governance (political will) resulting in ineffective implementation of CITES Article IV. And without the political will to effectively implement the provisions in range countries, Articles IV and XIV have limited functionality. Yet, national governance is a major driver or inhibitor of sustainable use objectives (Smith et al., 2003). For many species whose by-products are of high trade value (e.g. elephants/ivory, rhinoceroses/horn) and where producer countries do not effectively implement Article IV, the progression of species or individual populations from Appendix II to Appendix I is likely to occur sooner or later. This is rarely the case, however, in countries with comparatively stable political and economic conditions, as exemplified by the populations of the southern white rhinoceros (*Ceratotherium simum*) and the Nile crocodile (*Crocodylus niloticus*) in large parts of southern Africa. The up-listing of all populations of the African elephant (*Loxodonta africana*) in 1989 was strongly opposed by the economically stable nations of southern Africa where elephant populations were either stable or increasing at the time of up-listing (Cumming and Jones, 2005).

5.2.2.1. Elephants (Loxodonta africana). The conservation of the African elephant has been at the core of philosophical divisions within CITES since a total ivory trade ban was imposed with its up-listing from Appendix II to Appendix I at CoP7 (1989). It has focused on the benefits that income from ivory sales may bring to elephant conservation and to local communities living side by side with large and often dangerous animals, versus concerns that such sales may increase poaching. The Appendix I listing enjoyed moderate success, namely the collapse of the ivory market in Europe and the United States, which primarily benefited populations in countries north of southern Africa with relatively poor levels of field protection. However, this benefit was due to the massive, worldwide PR campaign associated with the Appendix I listing which could not be repeated for many other worthy species. Moreover, apparent benefits of the Appendix I listing seemed to be short-lived as the demand for ivory on Asian markets remained stable, with levels of poaching increasing again (Hutton and Dickson, 2000, pp. 69–87). The Appendix I listing resulted in a total trade ban not only on ivory but on the commercial sale of other derivatives such as hides and leather products, which seriously affected incomes of communities.

At CoP10 (1997), the range states Botswana, Namibia and Zimbabwe, and subsequently South Africa at CoP11 (2000), because of their proven record for sustainable management of elephant populations, succeeded in having their populations down-listed to Appendix II (Table 3). On that occasion, CITES also voted to allow Botswana, Namibia and Zimbabwe to auction off 50 tonnes of government ivory stockpiles to Japanese traders on a one-off experimental basis, which took place in 1999.

At CoP12 (2002), CITES voted again to allow Botswana, Namibia and South Africa to auction off another 60 tonnes of ivory from government stocks after May 2002. Conditions for the resumption of trade in African elephant ivory from Appendix II populations are set out in CITES Decision 10.2 (rev. CoP11) and Resolution Conf. 10.10 (rev. CoP12). Trade criteria include the admission of Japan as a designated trading partner and the acceptance of the MIKE Report with appropriate baseline data (*Monitoring of the Illegal Killing of Elephants*). MIKE provides for a system to objectively monitor the effects of raw ivory sales on African and Asian elephant population levels, and illegal hunting, following one-off ivory sales (CoP12 Decision 12.33–12.35, 2002).

Discussions at the 54th Meeting of the Standing Committee in 2006 made it apparent, that during the trade ban in raw ivory, the price of ivory had increased (IFAW, 2006) with no evidence of a significant decline in poaching in range states of Appendix I populations. This implies a failure of the trade ban to impact on the illegal ivory trade in range states with poor levels of field protection. Clearly, the current system of protection and trade restrictions for Appendix I populations of the African elephant seem ineffective, as was the Appendix II listing during most of the 1980s when the continental population of the African elephant

Table 5
Development of black market prices for horn of African rhinoceros (*Diceros bicornis* and *Ceratotherium simum*) in select countries following their CITES Appendix I listing in 1973 and 1977, respectively (from Hutton and Dickson, 2000, pp. 69–87).

Country	Period	Black market prices per kg horn
Japan	1976–1978	US$ 75–US$ 308
South Korea	1976–1981	US$ 49–US$ 530
Taiwan	1977–1980	US$ 17–US$ 477

declined by as much as 50% due to ivory poaching. This contrasts with southern African populations which either remained stable or increased during that period (Blanc et al., 2003; Cumming and Jones, 2005). Only time will tell whether a limited ivory trade funder a "split-listing" system is a workable solution for Appendix I populations in countries with poor governance.

At the 55th Meeting of the Standing Committee in 2007 and just days prior to the beginning of CoP14, both major criteria for the one-off sale of 60 tonnes of raw ivory to Japan were rubber-stamped. The admission of China as an additional ivory trading partner remained on the agenda. Ideally, controlled trade in raw ivory to both Japan and China should lower ivory prices and poaching levels.

Of significance at CITES CoP14 was the adoption of a decision on the part of African elephant range states on a consolidated Annotation for Appendix II populations (Table 3). The Annotation regulates the way in which each of the southern African range states South Africa, Botswana, Namibia and Zimbabwe are allowed to trade in hunting trophies, live animals, hides, hair, leather and raw or carved ivory (CITES Notification 2007/022). This represents a major change to the past two decades at CITES CoPs where most Appendix I range states strongly opposed sustainable use proposals of countries with Appendix II populations.

The 57th Meeting of the CITES Standing Committee (July 2008) voted favourably to provide China with trading status for raw ivory from South Africa (51,121 kg), Namibia (9209 kg), Botswana (43,682 kg) and Zimbabwe (3755 kg). However, this decision was strongly opposed by many other African elephant range states and demonstrates that the divisions within the African elephant range states on how to approach elephant conservation remain largely unchanged, despite the decision reached at CoP14 in 2007 on the consolidated new annotation to Appendix II populations.

5.2.2.2. Black (Diceros bicornis) and southern white rhinoceros (Ceratotherium simum). The decline of the black rhinoceros, Appendix I since 1977, is a further example that an Appendix I listing in no way guarantees the survival of the species in the absence of effective field protection. The species' decline is well documented for some range countries and is linked to a dramatic rise in black market prices for horn following the up-listing, political instability, corruption and lack of political will and resources to control poaching (Tables 5 and 6; Leader-Williams, 2002). The strict trade ban following its Appendix I listing thus did not improve the species' conservation status as illegal trade continued despite the ban and demand was further fuelled by speculative stock-piling (Emslie and Brooks, 1999; Hutton and Dickson, 2000, pp. 69–87). In fact, the listing and associated soaring of prices for rhino horn created a negative incentive by favouring poachers rather than conservationists (Leader-Williams, 2002). However, populations in South Africa and Namibia now show an encouraging upward trend (Emslie and Brooks, 1999). This apparent success is aided by the fact that CITES CoP13 (2002) attached commercial value to the species by allowing an annual export of five hunting trophies from each of these two range countries (Leader-Williams et al., 2005; Resolution Conf. 13.5). However, a current breakdown in law enforcement against rhino poaching and horn smuggling in Zimbabwe is threatening the positive trends in black rhino populations achieved in recent years (http://www.panda.org/news_facts/newsroom/press_releases/index.cfm?uNewsID=146284, 8 October 2008).

Table 6
Development of black rhinoceros populations (*Diceros bicornis*) in select countries following its CITES Appendix I listing in 1977 (from Hutton and Dickson, 2000, pp. 69–87).

Country	Period	Population trend
Zimbabwe	1987–1992	1750–430 animals
Tanzania	1981–1987	3790–275 animals
Zambia	1981–1987 approx.	3000–100 animals

The example of the southern white rhinoceros, whose South African population was down-listed from Appendices I to II in 1994, and whose populations in both South Africa and Swaziland have since recovered considerably in a politically stable environment, shows that the release of a species for commercial use, or its down-listing, can improve its conservation status (Amin et al., 2006). This success story is not only the result of strict national conservation measures, but also of the fact that, through the legalising of trophy hunting, the species once again became attractive to private landowners, which enhanced population growth and the re-colonisation of/or re-introduction to regions from which it had previously become extinct (Leader-Williams et al., 2005). The CoP13 decision (2004) to also down-list the population of Swaziland from Appendix I to Appendix II, with an annotation to allow trade in live animals to appropriate destinations and the annual export if five hunting trophies, further reflects the success story of the white rhino in southern Africa.

5.2.2.3. Leopard (Panthera pardus) and cheetah (Acinonyx jubatus). Apart from showing that commercial use can serve the survival of a species, the case of the leopard has revealed also that an Appendix I listing (1973) without quotas for hunting trophies, and consequent decline of its commercial value, can have a detrimental impact on the populations of a species (Hill, 1996). Landowners no longer considered the leopard a valuable asset to be protected, but increasingly persecuted it due to attacks on livestock, and populations were markedly reduced. In 1983 (CoP4), a system of national export quotas was established for the leopard (Resolution Conf. 10.14 rev. CoP14), and populations in southern Africa subsequently showed a significant increase (Martin and de Meulenaer, 1988). The same motives were behind the decision at CoP9 (1994) to establish national export quotas for the cheetah (Resolution Conf. 9.21 rev. CoP13), which also proved successful after some 7000 animals were shot for livestock protection during the 1980s alone (CITES CoP8 Doc. 8.22, 1992; Leader-Williams and Hutton, 2005).

5.2.2.4. Nile crocodile (Crocodylus niloticus). CITES Resolution Conf. 3.15 (1981; succeeded by Resolution Conf. 11.16 rev. CoP14, 2007), allows the down-listing of Appendix I species for commercial use and deals with ranching and trade in ranched specimens of species transferred from Appendix I to Appendix II. The first successful down-listing request came from Zimbabwe in 1983 and referred to populations of the Nile crocodile. Ranching requests (population-oriented) relate to individual member States. They maintain the trade ban with other countries and in other populations and therefore do not bundle the potential for the conservation of an entire species. However, because of the manner in which ranching is defined and practised under CITES, crocodile ranches would not be feasible without intact wild populations, and they generate economic incentives for the conservation of those populations. Whereas 30 years ago all 23 crocodile species

were classified as *critically endangered* or *endangered* in the IUCN Red List of Species (International Union for the Conservation of Nature), only seven of them are so today – *in situ* commercial breeding projects have contributed decisively to this success (Hutton et al., 2001; Hutton and Webb, 2003; IUCN/SSC Crocodile Specialist Group, 2004).

The above species case studies demonstrate three important points: (1) the developing nations of southern Africa have significantly influenced the promotion of the sustainable use paradigm, including lethal extraction, as a conservation strategy at the international level (see also Hutton and Dickson, 2000, pp. 107–124); (2) the probability of achieving the desired conservation effects may not be adequately considered by Parties when listing species on the CITES Appendices; and (3) CITES trade measures have limited capacity to effectively protect commercially important CITES-listed species in the absence of good national protection measures in range states.

For the vast majority of CITES-listed species, however, the effects of trade measures are largely unknown, primarily because of an absence of accurate biological and trade data and the multiplicity of other factors that contribute to the conservation status of the listed species (Hutton and Dickson, 2000, pp. 69–87; IUCN, 2001; Roe et al., 2002; Schlaepfer et al., 2005). The effects of international trade on the conservation status of CITES-listed species are usually subordinate to those of other influences such as habitat loss (IUCN, 2001), while the combination of habitat loss and economic exploitation of species may convert sustainable into unsustainable use.

6. Local communities, incentive-driven conservation and sustainable use

The mandate of the Convention concerns the protection of species from non-sustainable use through international trade, and it is no coincidence that in the preamble of the CITES it is recognized that "peoples and States are and should be the best protectors of their own wild flora and fauna" (Wijnstekers, 2006). But the Convention has limited capacities to ensure that use is sustainable. The African elephant and black rhinoceros highlight the shortcomings in the CITES control mechanisms which do not impact upon other important factors like habitat loss, consumer demand, domestic trade regimes and supply mechanisms (Carey, 1999). As such, CITES emphasizes restrictions on trade rather than proactively facilitating trade that may ultimately benefit species.

In the long run, sustainability can be achieved only through the active participation of exporting countries and their local rural communities (Thomson, 2003; Fisher et al., 2005). Although the Strategic Plan of CITES for the period 2008–2013 includes recognition of economic concerns of affected communities (Resolution Conf. 14.2, CoP14), such incentives will not develop automatically. It is also beyond the mandate of the Convention to facilitate economic returns which can only be achieved by national political initiatives of individual contracting Parties.

In recognition of the failure of a centrally controlled approach to conservation, Zimbabwe was the first African country to develop an alternative approach to the management of natural resources outside national parks and other protected areas in the 1980s and 1990s (Muir and Bojo, 1994; Hutton and Dickson, 2000, pp. 181–197). It was developed as a complementary strategy by dealing with conservation through sustainable use outside protected areas where governments have limited potential to provide effective conservation management (Jones and Murphree, 2004). The so-called Community-Based Natural Resources Management (CBNRM) involves pushing back the regulatory role of the State and transferring the responsibility for species conservation to local communities which share their living space with wildlife in extensively managed areas outside protected zones. Zimbabwe has led the southern African region in establishing a wildlife policy and legislative framework to provide for wildlife management not only in protected areas but also on private and communal lands (Barnett and Patterson, 2006). This approach is now applied in most southern African countries to varying degrees and levels of success and represents a valuable supplement to the global CITES trade regime. However, it can only develop its full potential under politically and economically relatively stable and supportive conditions (Smith et al., 2003).

By transferring ownership or user rights, local communities can benefit directly through ecotourism (non-extractive use), hunting safaris, etc. and consequently have a correspondingly higher incentive to utilize wildlife sustainably than under the existing CITES system which lacks economic incentives – particularly when such community-oriented sources of income from species conservation projects exceed those from other types of land-use (e.g. clearing and agricultural production). Direct incentives come from trade in skin, ivory, meat, carved works from various materials like wood and ivory, ecotourism and the selling of hunting permits (Cumming, 1991; Carey, 1999). Property rights in particular are a critical element in understanding why some resources are effectively conserved and others are not (Hardin, 1968). Not only CITES, but also the CBD considers community-based conservation as an important element in national conservation strategies (CBD CoP9, 2008, Decision 9.6 on Incentive Measures, CBD Article 11).

In Zimbabwe, the system of communal management has since the mid-1980s been practiced in the framework of the CAMPFIRE project (*Communal Areas Management Programme for Indigenous Resources*) (Martin, 1986; Hutton and Dickson, 2000, pp. 181–197), with steadily increasing annual revenues from hunting tourism in communal lands in the 1980s and 1990s (Fig. 1). While CAMPFIRE has been a success in meeting conservation and societal concerns, a major constraint to it achieving optimal results has been that the appropriate authority has only devolved to rural district councils rather than to the actual producer level, the local communities. As a result, much of the district council earnings have not reached affected communities (Bond, 2001). In recent years Zimbabwe has developed political, economic and social problems with associated detrimental impacts on *CAMPFIRE* (Barnett and Patterson, 2006).

Namibia has a well-functioning CBNRM system where legislation devolving user rights over wildlife and tourism to communal area residents was approved by Parliament in 1996. In 2001, the Forest Act was passed which similarly regulates the rights over

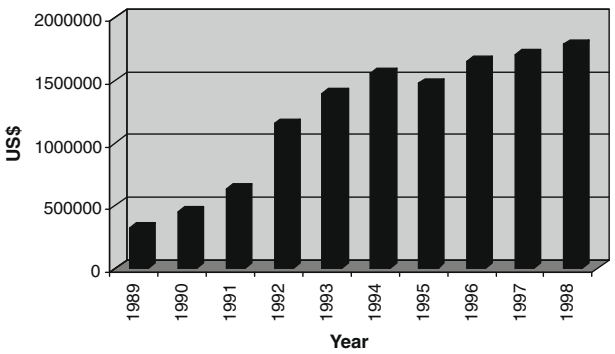

Fig. 1. Annual revenue from sport hunting generated by Rural District Councils associated with the CAMPFIRE Programme in Zimbabwe (*Communal Areas Management Programme for Indigenous Resources*) (Source: Bond, 1997; Barnett and Patterson, 2006).

forest resources. Since landowners were allowed to benefit directly from managing wildlife on their land, wildlife on private land in Namibia increased by 80% (Barnes and de Jager, 1996). By encouraging communities to form land management units called conservancies, the programme aims to recreate a common property resource management system for wildlife and tourism (http://www.met.gov.na/programmes/cbnrm/cbnrmHome.htm, 17 May 2008). An example of Namibian CBNRM projects involves the Nyae Nyae Conservancy, the first of its kind in Namibia, where development opportunities in wildlife (meat, hunting trophies) and tourism-related benefits have been projected to increase from N$1 250,000 in 2002 by 360% in 2007 and by 930% in 2015. Direct beneficiaries are the Ju'hoansi Bushmen (http://books.google.at/books?hl=de&id=vKgnV92ty6YC&dq=Conservation+and+development+interventions+at+the+Wildlife/livestock+interface:+implications+for+wildlife,+livestock+and+human+health&printsec=frontcover&source=web&ots=evIE_WNMEo&sig=UJUCpPrrwrMAI-0wu-64VdFkeAHE#PRA1-PT1, M1, 29 September 2008).

Botswana provides a further example of successful communal management. The entire country of Botswana is split up into administrative blocks called Controlled Hunting Areas (CHAs). Each area has a wildlife off-take quota designated by the Department of Wildlife and National Parks (DWNP). Some CHAs, such as protected areas, have a hunting quota of zero. Other CHAs are designated for community-use. Before 1995, only individual community members could apply for Game Licenses to hunt certain game for their personal consumption. Now, if a community organizes itself and forms a representative Quota Management Committee, it can be recognized by DWNP to manage the whole area's quota. The committee will decide how to divide up the quota among families, and send wildlife monitors out on hunting trips to make sure the quota is adhered to. If the community then forms a legally recognized Trust and develops a Land Use Plan, it can apply for a lease over the CHA from the Tribal Land Board. This will allow the Trust to sub-lease use of their land and their quota to a tourism company for photographic or hunting safaris. This has the potential to generate substantial income in rural areas (http://www.cbnrm.bw/, 28 May 2008; Schuster, 2007).

Similar projects with the devolution of ownership or user rights are carried out in Zambia, South Africa and Tanzania (e.g. Lewis and Alpert, 1997; Hasler, 2003; Nelson, 2004) and play a critical role in ensuring habitat protection while focusing on use of individual species. What may be unique to Africa as a whole, Zambia has established an "African College for Community-Based Natural Resource Management" (http://www.africancollege.edu.zm/frame.htm, 28 May 2008).

For a variety of reasons, community-based approaches to resource use generally work sub-optimally in southern Africa: some countries have yet to establish an appropriate legislative framework for the effective devolution of community rights over wildlife resources and related economic mechanisms, some of the programmes are in their infancy and many species are unsuitable for extractive utilization (e.g. Patel, 1998; Child, 2000; Jones and Murphree, 2001). Despite this, the concept of communal management, which links conservation with societal concerns, remains the only likely approach to secure sustainable species conservation outside protected areas in developing countries and can thus be considered a critical supplement to the CITES system of global trade regulation (Getz et al., 1999; Dickson, 2000, 2002; Roe et al., 2002; Jones and Murphree, 2004). Nevertheless, well analyzed examples where incentive-driven conservation has resulted in clear conservation benefits to particular species are difficult to find. It therefore becomes increasingly important to identify the conditions under which incentive-driven conservation is most likely to achieve sustainable use. The need to address this information deficit is further underlined by the expected human population increases which are likely to result in significant increases in natural resource use, particularly where use is an imperative rather than a choice.

In addition to communal area management, so-called (private) hunting farms and "conservancies" offer a further possibility for sustainable use. Hunting farms practice a mixture of extensive cattle management and trophy hunting and are wide-spread in southern Africa. Conservancies, on the other hand, usually consist of a group of neighbouring, formerly extensively managed cattle farms or of "communal areas" which are joined to manage wildlife sustainably, primarily on the basis of trophy hunting, with the exclusion of cattle and the elimination of internal fences. Conservancies have also assumed an important role in the conservation of particularly endangered species, like the black rhinoceros (Weaver and Skyer, 2003). The development of hunting farms and conservancies for the sustainable use of CITES-listed species in southern Africa is a positive development (Child, 2004), and contrasts the Kenyan experience where a complete ban on trophy hunting in 1977 is associated with a 40–60% decline in wild herbivore populations (Ottichilo et al., 2000).

The importance of the hunting industry to the southern African region is significant. For example, direct annual sport hunting revenues in the late 1990s were substantial at US$29.9 million in Tanzania, followed by US$28.4 million in South Africa and US$23.9 million in Zimbabwe, and in some countries these figures are expected to rise or even double (Bond, 1997). While initially most sport hunting revenue accrued to governments and private landowners, more recently, an increasing proportion of such revenues has been apportioned between these two sectors and local communities (Barnett and Patterson, 2006). As such, the sport hunting industry can provide effective incentives for improved wildlife management in the region's State, commercial and communal lands. Moreover, sport hunting also benefits remote and underdeveloped rural communities, making it particularly important as an instrument to meet social and wildlife conservation objectives in communal areas (Barnett and Patterson, 2006).

In addition, the hunting industry can contribute towards reducing poaching levels, preventing the extension of agriculturally used areas and alleviating mass poverty in rural areas without destroying habitats (Baker, 1997; Murphree, 2003; Baldus and Cauldwell, 2004; Mbaiwa, 2004; Cumming and Jones, 2005; Barnett and Patterson, 2006; Loveridge et al., 2006). However, as part of a holistic resource use strategy, which includes eco-tourism, trophy hunting requires institutional structures to implement regulations and must be subjected to strict controls in order to ensure the sustainability of the system. This includes (i) scientifically sound and strictly executed quotas, (ii) the granting of hunting licences to companies with experience and integrity and (iii) budget transparency, above all ensuring financial compensation of the local communities (Baker, 1997; Baldus and Cauldwell, 2004; Mbaiwa, 2004; Barnett and Patterson, 2006). Accompanying studies on the impacts of trophy hunting on the genetic pool and reproduction success of the target species should be encouraged (Lewis and Alpert, 1997).

7. Relevance to other taxa and other regions of the world

Clearly, the southern African region has been successful in implementing the sustainable use concept to the species discussed in this paper because (1) the species are suitable for the purpose of sustainable use; (2) CITES legislation generally supported controlled trade in their specimens and/or products and (3) good national governance provided the necessary framework within which sustainable use could thrive, including incentive-driven conservation with community involvement and effective field

protection (with Zimbabwe and black rhino as the exception). While the underlying CITES legislation that has contributed to success can be adopted for other CITES-listed species irrespective of geography, the application of incentive-driven conservation strategies in other regions of the world may be limited by a variety of factors. They include biological (e.g. species unsuitable for sustainable use or ecotourism), geographical (e.g. remoteness stifling development of ecotourism) or political considerations (e.g. lack of support at the national or community level).

7.1. Animals

There are examples of CITES-listed vertebrates from other regions of the world where incentive-driven conservation has resulted in conservation success. This includes, for example, the crocodilians in Australia (Hutton et al., 2001; Hutton and Webb, 2003), *Tupinambis* lizards in South America (Fitzgerald, 1994; CITES Standing Committee 54 Doc. 41; http://biodiversity.tamu.edu/ABS-IGERTfundingproposal.pdf, 30 September 2008), Vicuña (*Vicugna vicugna*) in Bolivia (Sahley et al., 2007) and Markhor (*Capra falconeri*) in Pakistan (Javed and Azam, 2005). In Argentina, species with significant potential for sustainable use by local communities include Rhea (*Rhea Americana*), Darwin's Rhea (*Pterocnemia pennata*) and Guanaco (*Lama guanicoe*) (Uhart and Milano, 2002).

Species whose products and derivatives are of high commercial value face particular conservation problems in countries with poor governance, low income and high corruption levels (e.g. elephants, rhinos, etc.). This is likely to be exacerbated where affected species and their products are part of traditional medicinal purposes or traditionally form an important part of the diet of humans. In addition to effective enforcement, cooperation by local communities to assist in the implementation of conservation strategies is likely to be even more critical involving such species. The tiger and Asiatic bears (CITES Appendix I), which have traditionally been used for medicinal purposes, are used as examples from other regions to examine the extent to which incentive-driven conservation strategies have played a role in their protection.

7.1.1. Tiger (*Panthera tigris*)

Like the African elephant, the tiger has been a "flagship species" for conservation for several decades, yet most tiger populations have declined since the species' listing on CITES Appendix I in 1975 (CITES CoP14 Inf. Doc. 19, 2008). The species is now extinct in several regions of its former range and is today at greater risk of extinction than ever before, with a global population in the wild of less than 2500 individuals (Cat Specialist Group, 2002; Nowell and Xu, 2007). The species faces multiple threats including habitat loss and fragmentation and declining prey populations across its remaining range (7% of historical range, Sanderson et al., 2006). However, poor levels of success of protection strategies are due largely to unresolved on-the-ground conflicts between wild tigers and humans and livestock (with the resultant illegal killing of so-called "problem-animals"), high poaching levels with an ongoing national and international trade in skins and parts and derivatives for traditional medicine (bone, claws, etc.), and lack of political will to provide effective enforcement in many range states (Sanderson et al., 2006; Dinerstein et al., 2007). While illegal trade in tiger products continues, China's 1993 ban to trade in products derived from its extensive captive population of the species (tiger farms) has significantly contributed to protecting tigers in the wild (Nowell and Xu, 2007). However, commitment to protect the species varies between range states. At the 57th Meeting of the CITES Standing Committee (2008), only six of the 14 tiger range states complied with CITES Resolution Conf. 14.65 (2007) by providing reports on implementation of recommendations contained in CITES Decisions 14.65–14.69 (2007). Of these six reports, only four provide details of implementation measures (http://www.cites.org/eng/cop/14/doc/index.shtml, 14 October 2008). Nevertheless, China's trade ban on tiger parts appears to be effectively implemented, with signs that the threat posed by trade in tiger bones for medicinal purposes has diminished (Sanderson et al., 2006; Dinerstein et al., 2007; Nowell and Xu, 2007). Regardless, if the ongoing overall decline in the species' population is to be arrested, effective enforcement and community support will be the deciding factors in the species' fate. The latter includes community involvement in local decision-making processes, flow-on benefits to affected communities from tiger-related tourism and effective compensation measures for tiger-related livestock losses.

One of several conservation strategies involves the creation of tiger landscapes where core areas are linked with habitat corridors which depend on local community support. The success of the *Terai Arc Landscape Project* (TAL) in the foothills of Nepal and northwestern India, in the midst of some of the densest human populations in South Asia, demonstrates that the creation of corridors coupled with local community support, even for a large and dangerous predator, is feasible (Sanderson et al., 2006). Enhanced habitat connectivity is likely to improve the persistence of wild tigers (Linkie et al., 2006). TAL represents the combined efforts of several partners, including the Department of National Parks and Wildlife Conservation (DNPWC) in the Ministry of Forests and Soil Conservation of Government of Nepal, as well as WWF Nepal. The legal framework through which TAL works is "community forestry" which enhances income and empowers local women to participate in management and decision-making (http://www.panda.org/about_wwf/what_we_do/species/our_solutions/programmes/species_people/our_solutions/tal_nepal/index.cfm, 29 September 2008).

Given political will, governments, in addition to enforcement, have the means to provide adequate incentives for effective species protection. However, with few exceptions, the development of effective incentive-driven strategies to protect wild tigers has not been achieved in range states.

7.1.2. Asiatic bears

Bear species native to Asia are listed on CITES Appendix I (e.g. Asiatic Black bear *Ursus thibetanus*, Sloth bear *Melursus ursinus*, Sun bear *Helarctos malayanus*). Most are subjected to habitat loss and significant national and illegal international trade in their parts and derivatives, particularly the gallbladder and its bile for traditional medicinal purposes in range countries (Gupta et al., 2007; Shepherd, 2007). Trade in bear products has detrimentally impacted wild populations (Mills et al., 1995).

While bear species occur in most countries of the Asian region, the status of most wild populations are poorly known but are believed to be declining (Shepherd, 2007). All range states have legislation protecting bear species, but range states differ in legislative measures against trade in bear parts and derivatives and the legality of bear farming for bile extraction (Xuan Dang, 2007). Domestic trade remains legal in some range countries and enforcement and national legislation appear inadequate to effectively impact on illegal trade in bear parts in most range states (Shepherd 2006; see also CITES CoP14 Doc. 24, 2007, for the quality of legislation in countries of the region).

China has a 2000-year history of traditional medicinal use of bear bile. Given rising demand with increasing human populations, and detrimental effects on wild bear populations, legal bear farming for bile production in China started in the early 1980s, particularly with the Asiatic Black bear (Haikui and Zhi, 2007). However, none of China's bear farms is registered with the CITES Secretariat, which is required if Appendix I bears, bear parts or their derivatives originating from such captive breeding facilities are to be traded internationally for commercial purposes (e.g. as

ingredients in medicines). A series of laws, regulations and administrative policies developed between 1988 and 2006 have established a legal framework to regulate and manage captive breeding, bile production and the protection of China's wild bear populations. Controls on trade in bear products have been put in place and the number of legal bear farms has been reduced from 480 to 68 during that period. Bear farms need to be licensed with associated standards with regard to breeding conditions and animal welfare concerns regarding bile extraction techniques (Haikui and Zhi, 2007).

Haikui and Zhi (2007) argue that development of bear farming has reduced pressure on wild bear populations in China, resulting in increased conflicts between wild bears, locals and livestock. As a consequence, balancing local community development and wildlife protection has become a major challenge to local government and wildlife authorities in China and that there is as yet no clear policy to address this issue at relevant levels of government. Despite government compensation payments to locals for losses caused by wild bears, payments are quite inadequate to meet costs incurred, which provides a disincentive to bear protection. Given the history of traditional use of bear bile, the size of the country and its immense human population and associated demands for bear products for traditional medicine, a national trade ban policy against the large medicinal community in China, in the absence of accompanying financial incentive mechanisms that promote sustainable use, would be unlikely to succeed.

But national and cross-border trade in bear gall bladders is spread over a wide range of other countries in Asia, including India, Japan, Malaysia, Vietnam, Nepal, Sri Lanka, Bangladesh, Cambodia, Thailand, Laos and others. Significant effort needs to be put into assessing the population status of affected species and increasing transparency of bear-farming practices in China, including the effects of bear farming on wild populations. In addition, what appears to be lacking in most range states is not only political will to enforce trade bans, but effective communication and coordination of local, national and regional high-profile, multi-organizational, multi-agency efforts to raise the bear issue to a high level. This includes enhancing public awareness, strengthening a constructive dialogue with the traditional medicine community to explore mid- to long-term options regarding use and trade in bear bile, assessing the potential benefits of changes in tenure, community-involvement in relevant decision-making processes regarding land-use strategies, and developing effective financial incentives for the use of alternative products coupled with adequate compensation payments for bear-related livestock losses (Williamson, 2007).

The case of tiger and Asiatic bears suggests that for species whose high-value products have a long tradition in medicinal use, development of effective incentive-driven conservation strategies may be more difficult to achieve than for other species. However, in the absence of community cooperation in the implementation of conservation strategies, which is likely to be incentive-driven, effective protection of the species will fail. It also highlights the need for a critical evaluation of the necessary conditions under which incentive-driven conservation strategies promote sustainable use.

7.2. Plants

The sustainable use principles apply equally to plant as to animal species, as does the concept of incentive-driven conservation. Community-involvement in the conservation of plants is somewhat better known for medicinal than for timber species, but in all cases effective incentive-driven conservation strategies require relatively stable political conditions, appropriate institutional support and, above all, tenure security. Where this is lacking or poorly developed, use is likely to be unsustainable.

7.2.1. Harpagophytum spp. (Devil's claw)

The rootstocks of Devil's claw in southern Africa have long been used by indigenous people for the treatment of a variety of ailments. But with the arrival of European farmers, the species' abundance has taken a sharp decline (Hachfeld and Schippmann, 2000). The plants' claws caused injuries to livestock and specimens of the species were extensively uprooted by farmers. Largely unprocessed rootstocks of the species now supply a growing international market for the treatment of osteo-arthritis and rheumatism, with 700 tons sold in 2001 to primarily Germany (Wynberg, 2004). The result has been a significant escalation in harvesting levels of the secondary storage tubers of wild specimens, with detrimental harvesting techniques posing a particular threat to wild populations (Hachfeld and Schippmann, 2000). In 2001, 92% of trade originated in Namibia involving *H. procumbens* (CITES Plants Committee 12 Doc. 8.1, 2002; Wynberg, 2004). Harvesting is estimated to provide the sole source of income for 10,000–15,000 marginalized rural families in Namibia. Given the remoteness of the species' distribution, the level of sustainability of current harvesting is unclear (CITES CoP13 Inf. Doc. 10, 2004). A proposal to list the species on CITES Appendix II in 2000 (CITES CoP11) was withdrawn because of predicted detrimental effects on incomes to local people whose livelihood depends almost entirely on the sale of wild-collected specimens. Nevertheless, range states agreed to on-going reporting to the CITES Plants Committee on trade and management of Devil's claw (CITES CoP13 Inf. Doc. 12, 2004). In addition, *H. procumbens* was listed in the EU Annex D of EU Regulation 834/2004 which requires a notification to customs authorities at point of entry into the European Union and serves statistical purposes as a trade monitoring tool. Nevertheless, the attempt to list the species on CITES Appendix II has been a disincentive to sustainable management as investments, foreign exchange earnings to the state of Namibia and in income to local harvesters significantly declined following the listing (Lombard and du Plessis, 2003). Since CoP11 (2000), a successful cultivation project has been carried out with recommendations for knowledge transfer to local communities and sustainable harvesting methods of wild specimens (Schneider et al., 2006).

While the species provides significant income potential for some of the most impoverished communities in southern Africa, rural harvesters currently receive at best 0.4% of the retail price (Wynberg, 2004). Several barriers impede the plant's conservation and development potential for local communities. This includes difficulties in effectively monitoring populations and enforcement of management plans in remote regions, inadequate tenure security, poor business, management and organisational skills at the community level, and the fact that foreigners hold virtually all existing patents for the processing of Devil's claw. At the international level, monopoly control through big industry prevents local harvesters and range states from reaping realistic benefits, while successful development of cultivation methods may act as a negative incentive to sustainable use of wild populations because it detrimentally impacts on incomes for local communities dependent on harvesting wild specimens in remote regions (Wynberg, 2004). Increasing recognition by government of the importance of maintaining sustainable trade levels give hope that critical issues such as the promotion of national value-adding industries, effective management but particularly tenure security will be addressed as a matter of urgency which will not only benefit communities but also species and ecosystem preservation (Wynberg, 2004; CITES CoP13 Inf. Doc. 10, 2004).

7.2.2. Prunus africana (Pygeum, African cherry, Red stinkwood)

The species is found in montane sub-Saharan Africa and Madagascar and is exploited primarily for the harvesting of its bark for medicinal purposes. Until 1972, medicinal use was restricted to

local communities but then rapidly developed into an important source of income through the international trade in dried bark and bark extract for the treatment of prostate ailments. On mainland Africa, most trade originates from Cameroon, with Europe as the major market (Ndibi and Kay, 1997). Most of the Pygeum trade from Cameroon stems from the Mount Cameroon area and is of significant social and economic importance (Acworth and Ewusi, 1999). However, excessive debarking or the felling of whole trees became increasingly unsustainable and the species was listed on CITES Appendix II at CoP9 (1994).

Despite significant efforts of the part of government, business, union and local community leadership, and considerable improvements in many areas of management and community involvement, problems remain in tenure arrangements, enforcement, sanction mechanisms, corruption, accountability, incentive structures and sustainable use (Acworth and Ewusi, 1999; Odera, 2004; Oyono et al., 2005; Ekane, 2006). At the 42nd Meeting of the European Union Scientific Review Group (SRG) on the 7th of December 2007, the EU formed a negative opinion for the import of Pygeum from Cameroon, which remains in place (October 2008).

Despite apparent deficits in management and use strategies that need to be resolved, the greatest benefit of the efforts to manage and trade Pygeum in Cameroon to date has been the creation of broad awareness of the need for sustainable use of forest resources, and that it supports local livelihoods based on forest resource use, albeit at inappropriate levels (Ndibi and Kay, 1997; Acworth and Ewusi, 1999; Ekane, 2006; http://srdis.ciesin.columbia.edu/cases/cameroon-001.html, 30 September 2008).

7.2.3. Caesalpinia echinata (Pernambuco, Pau Brasil)

Pernambuco is confined to the Brazilian Atlantic rainforest and has been of great historical and cultural importance to the country. Large quantities of wood were exported from the 16th to the 19th century, especially to Europe. From the mid-19th century, Pernambuco has attracted considerable economic interest as the only wood suitable for the manufacture of violin bows. It is subject to high international demand, particularly from Europe and the USA, including illegal trade, and there is some national trade for a variety of mostly industrial and domestic purposes (fence posts, railway ties, furniture, etc.). The species is now extinct in parts of its range. Because there is no known substitute for the production of violin bows, trade will continue. The species has been discussed in the CITES Plants Committee for some years (e.g. CITES Plants Committee 13 Doc. 14.2, PC13 Inf. Doc. 4, 2003) and was listed on CITES Appendix II at CoP14 (2007).

In addition to national legislation aimed at controlling use and trade (CoP14 Prop. 30, 2007), various stakeholders have initiated cooperation to ensure that a sustainable use strategy is implemented. This includes the "Confederation of Craftsmen and Users of Natural Resources" (COMURNAT), the "International Pernambuco Conservation Initiative Deutschland" (IPCI-Germany) and the "International Pernambuco Conservation Initiative – United States of America" (IPCI-USA) on behalf of their bow and violin maker members (CITES Plants Committee 13 Inf. Doc. 4, 2003). In 2000, COMURNAT made bow-makers aware of the possible long-term implications of availability of supply, and that they not only had an interest but also an opportunity to become involved in the conservation and sustainable use of the species (PC13 Inf. Doc. 4, 2003). As a consequence, IPCI was created. These Pernambuco initiatives fund workshops and conferences to encourage dialogue between stakeholders, including a partnership between professional bowmakers and state authorities.

The five-year *Programa Pau Brasil* was established in 2004 and was developed for the IPCI by *Ceplac*, an agricultural and forestry institute located in the Province of Bahia. The programme involves a partnership with other regional institutions to carry out inventories, phenology and collection, research, public policies, environmental education, regeneration, and participation of local communities through community-based restoration programmes (http://www.ipci-usa.org/page3.html; http://www.tree2mydoor.com/dedicate_a_tree/brazil_project.asp, 29 September 2008).

SoundWood, a conservation programme of Fauna and Flora International (FFI), addresses declining stocks of timber valued by the music industry by looking at practical, on-the-ground solutions to their sustainable use where people who depend on the forests for their livelihood benefit from the timber they contain (http://www.globaltrees.org/downloads/teacher_handbook_for_england.pdf). This forms part of the Global Trees Campaign, a joint initiative with the UN Environment Programme - World Conservation Monitoring Centre (UNEP-WCMC).

7.2.4. Ramin (Gonystylus spp.)

Ramin is a tropical hardwood found in state-owned forests of Southeast Asia, particularly peat-swamp ecosystems. It comprises about 30 species and has been subjected to unsustainable international trade, resulting in its up-listing from CITES Appendix III to Appendix II at CITES CoP13 in 2004. Excessive logging and habitat destruction has significantly affected commercial operations for its exploitation on Peninsular Malaysia (CoP13 Prop. 50, 2004). Ramin is traded internationally primarily in processed form, and its versatility and scarcity make it the most valuable timber in the region, with market prices up to US$1000/m^3. In 2001 Indonesia, the major exporter of ramin, imposed a national logging ban (CoP13 Prop. 50, 2004). The ban was followed by an inventory of stockpiles, which were then allowed for export under strict controls until the end of 2001. After 2001, trade was restricted to concessionaires holding a certificate of Sustainable Forest Management with an annual harvest quota set by the government of Indonesia. To reduce smuggling of Indonesian ramin into Malaysia, the Malaysian Government imposed an import ban on Indonesian ramin logs (CoP13 Prop. 50, 2004).

Various activities have made a significant impact on reducing illegal trade and improving sustainable use of ramin within Malaysia (CITES Standing Committee SC57 Inf. Doc. 4, 2008). This includes the CITES-ITTO timber programme on ramin (International Tropical Timber Organization) which provides funding for inventory projects within Malaysia, national management plans and improved enforcement, a cautious harvest quota, tightening legislation, timber certification and the non-detriment finding process associated with the species' up-listing in CITES (CITES export permits). As for other species, financial rewards of sustainable use need to be large enough to support practical conservation action. The need for sustainable timber production has given the government of Malaysia the necessary incentive for the setting aside of "Permanent Reserved Forests" (PFR), including enhanced protection of the species' preferred peat-swamp forests, which provides long-term benefits to local communities through permanent employment for people involved in harvesting and processing activities within Malaysia (CITES SC57 Inf. Doc. 4, 2008; SC57 summary record, http://www.cites.org/eng/com/SC/index.shtml).

8. The future of sustainable use within the Convention

Given that effective species conservation within CITES depends on the good will of the countries, enterprises and affected communities, the issue of sustainable use remains problematic for two reasons: (1) effective implementation of Article IV of the Convention is not imminent and (2) incentive-driven conservation, though potentially the most promising longer-term conservation strategy outside of protected areas in developing countries, depends upon political will and community involvement, preconditions which

many developing countries are unable or unwilling to provide. How is the Convention most likely to respond to these issues?

On the basis of the *CITES Strategic Plan Through 2005* tabled at CoP11 (Doc. 11.12.2, 2000), the CITES Secretariat presented a document on "Economic incentives and trade policy" at CoP12 (Doc. 18, 2002), of which a draft decision was adopted (Decision 12.22, 2002). The decision calls on the Secretariat to conduct voluntary national wildlife trade policy reviews, and to organize a technical workshop on wildlife trade policies and economic incentives applicable to CITES-listed species. The *Workshop on Economic Incentives and Trade Policy* was held in 2003 (CITES Notification 2003/064; http://www.cites.org/eng/prog/economics.shtml, 14 October 2008). Workshop results were presented at the 50th Meeting of the CITES Standing Committee (SC50 Doc. 11, 2004), and some of the recommendations included (1) that the use of economic incentives is the prerogative of the Parties; (2) that the practicality of introducing economic incentives will vary between countries and that countries would require guidance on how to develop incentive structures; (3) that absolute trade bans act as disincentives and hence are counter-productive to sustainable use and (4) that the devolution of secure property rights to local communities is a critical aid to enforcement and is likely to benefit conservation. National progress made on economic incentives was reported on at the 54th Meeting of the CITES Standing Committee (SC Doc. 41, 2006).

Poor governance remains a major hurdle in the protection and sustainable use of CITES-listed species in many developing countries. In addition to stricter enforcement and effective use of non-detriment finding processes in exporting countries, it highlights the need for the international conservation community and relevant governmental and non-governmental organisations, to engage with and encourage relevant countries to provide incentive-mechanisms for local communities for the use and protection of their resources (see above). In the presence of market demand, however, and despite the need for temporary trade bans to ensure compliance, international trade bans against poorly governed countries are generally unlikely to encourage sustainable use and system reforms for the devolution of ownership or user rights.

The manner in which signatory countries implement the Convention shows increasing support for the concept of sustainable extractive use of wild species and incentive-driven conservation strategies, and this can be expected to increase further. More recently, this has been evident in the Strategic Plan 2008–2013 presented at the last Conference of the Parties in The Haag in June 2007 where CITES' need to contribute to the Millennium Development Goals of the UN has been reiterated. However, it is now upon developing CITES member states to encourage tenure arrangements that enhance species conservation as well as poverty reduction.

Given the multiplicity of threats to CITES-listed species (Hutton and Dickson, 2000, pp. 13–28), and the focus on a single contributing factor on the part of the Convention, the potential for cooperation between CITES (a trade convention in the service of species protection) and the Convention for Biological Diversity (CBD), which is concerned with the much broader goal of sustainable development, is significant (e.g. Resolution Conf. 10.4, 1997; CoP12 Doc. 17, 2002; CITES Notification No. 2005/17). Cooperation between these two Conventions may be particularly desirable in two areas: (1) CITES Article IV implementation through the *Significant Trade Review Process* could be improved through the cooperative development of harvesting protocols for internal purposes as well as for international trade and (2) the livelihoods of local communities which of necessity requires an effective incentive-driven conservation strategy which has the explicit support of the CBD. Furthermore, closer strategic cooperation with the CBD would most likely improve the availability of necessary funds through, for example, "GEF", the Global Environment Facility (Hutton and Dickson, 2000, pp. 47–56).

As most countries that have ratified CITES are also contracting Parties of the CBD, there is an additional noteworthy component to cooperation between these two conventions. Because of CITES' strong sanctions and compliance mechanisms (Reeve, 2006; Sand, 2006), accession to CITES clearly limits national sovereignty. Membership of the Convention for Biological Diversity (CBD) *strengthens* national sovereignty such as through the "access and benefit sharing" mechanism (e.g. Article 8(j) and related provisions associated with indigenous and local communities; Secretariat of the Convention on Biological Diversity, 2005). In contrast to the CBD with its much broader conservation agenda, CITES regulations, while recognizing the link between biodiversity and livelihoods (CITES Decisions 14.3 and 14.4, 2007), currently lack a clear mechanism to meet livelihood interests. Here, a constructive dialogue between the two conventions on how best to address both sustainable use and livelihoods of local communities should be encouraged.

The listing of species on CITES Appendices I and II is in most cases sensible from a conservation point of view and is underpinned by the listing criteria of Resolution Conf. 9.24 rev. CoP14 (2007). The criteria are based on an adopted proposal on the part of southern African states to ensure that criteria for species listings are based on sound science (CITES CoP8 Doc. 8.50, 1992), and have been part of southern Africa's significant impact on the development of CITES with regard to sustainable use. However, CITES listing criteria lack a socio-economic component and listings may thus act as a negative incentive for sustainable use and incentive-driven conservation (1) by treating all producer states equally, despite their different conditions and conservation efforts (e.g. African elephants), (2) by favouring poachers rather than conservationists because of differences in financial benefits associated with resource use (e.g. African rhinos) and (3) by stifling investment (e.g. Harpagophytum spp. in Namibia). To enhance sustainability and awareness of livelihoods, and to avoid negative incentives, the international CITES community may need to consider whether CITES Appendices I and II listing decisions should be based not only on biological/trade criteria but also on socio-economic considerations, if it is in the conservation interest of the species involved. This would be in line with CITES' recognition of potential listing impacts on livelihoods (CITES Resolution Conf. 8.3 rev. CoP13, 2004).

While the issues *sustainability* and *incentive-driven conservation* (livelihoods) in developing countries are closely linked, the wheels of bureaucracy in Geneva (CITES Secretariat) and Brussels (European Commission) grind slowly. Moreover, a document containing proposals about CITES–CBD cooperation presented by the CITES Secretariat at the 53th Meeting of the Standing Committee in Geneva in 2005 met with varying levels of support (see also Resolution Conf. 10.4 rev. CoP14). Opponents of intensified levels of cooperation (e.g. the North-American region and Oceania, some NGOs) argued that in the first instance synergies within CITES, such as cooperative linkages at national levels, need to be strengthened before synergy activities with other Conventions should be considered. To what extent these positions are politically motivated is difficult to determine. Irrespective, cooperative initiatives require no "top-down" instructions and can be taken at the bilateral level.

Recent global economic developments that have destabilized the food market for the world's poor in particular, emphasize the urgency to further develop national socio-political frameworks that provide for effective community involvement in the sustainable use of natural resources in developing countries (The New York Times, 10 April 2008).

9. Conclusions

Despite the formal recognition on the part of the Convention that extractive use can, under certain circumstances, benefit the

conservation of species, and the notable successes that the Convention has achieved in promoting protection of some species in international trade in this regard, the Convention needs to more proactively facilitate trade where this may be beneficial to the survival of a species. An important challenge for species conservation within a CITES context will therefore lie in the development of tools or socio-biological indicators to identify species which will benefit from trade (whether through lethal or non-lethal extractive use), and the creation of effective mechanisms to facilitate sustainable, legal trade while discouraging unsustainable, illegal exploitation.

CITES also implicitly expects that individual contracting Parties not only act to serve nature and species conservation, but also serve the livelihood interests of local communities. With the exception of some southern African nations, this is unlikely to be realistic in most other parts of Africa and regions of the developing world where such communities remain for the most part excluded from significant trade profits. However, in the long run species conservation outside of protected areas, irrespective of geography and taxon, requires a close coexistence between humans, animals and plants and a rededication of user rights from the national to the, for example, communal level. In the mid-to long term, incentive-driven conservation through local communities and effective tenure security is the key to the sustainable conservation of threatened species in the extensive regions outside of protected areas because it addresses the dual goals of species conservation and poverty alleviation, and because by focussing on species it inevitably results in the protection of their habitats. To be successful, incentive-driven conservation necessitates not only the pro-active support of the governments of affected member States but also of CITES. Not only user rights but also trade opportunities and incentives would have to be addressed. Regardless, the conditions under which incentive-driven conservation is most likely to promote sustainable use must be clearly identified, particularly as human population growth in affected countries will further increase natural resource use in the future.

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