

# MAKING A KILLING OR MAKING A LIVING?

## Wildlife trade, trade controls and rural livelihoods

Dilys Roe, Teresa Mulliken, Simon Milledge, Josephine Mremi,  
Simon Mosha and Maryanne Grieg-Gran



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**Suggested citation:** Roe, D., Mulliken, T., Milledge, S., Mrcmi, J., Mosha, S. and Grieg-Gran, M. (2002). *Making a killing or making a living? Wildlife trade, trade controls and rural livelihoods*. Biodiversity and Livelihoods Issues No. 6. IIED, London, UK.

**Front cover photograph:** A *matshi* market south of Durban, South Africa.

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ISBN no. 1 84369 215 5

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*March 2002*

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One of the more contentious issues in the CITES decision-making process is provided for under CITES Article XIV, which allows Parties to take stricter domestic measures than those required under the Convention. Few have argued over the right of Parties to ban exports of native species but the right of Parties to unilaterally ban imports is less widely accepted. Stricter domestic measures may have WTO implications.

### **Impacts of wildlife trade regulations**

Examining the impacts of wildlife trade controls is not straightforward for a number of reasons. Wildlife trade is affected by a bundle of regulations governing access to resources as well as access to markets - some externally motivated, others long standing domestic requirements. The impacts of these and other regulations are further determined by the associated enforcement effort and effectiveness. Campaigns aimed at changing consumer behaviour, i.e. those directed at reducing demand for certain species or products, have a significant and often greater impact on trade patterns than do changes in trade controls. Changes in trade volumes and related livelihood impacts can also be entirely independent of any concerns related to the trade itself, e.g. as a response to changing fashion trends or economic conditions in countries of export or import. Nevertheless, it is possible to observe some general effects of increased trade controls on trade patterns, including modes of production. Shifts in the trade have consequent impacts on the livelihoods of collectors and traders as well as on the status of the target species.

### **Impacts on wildlife**

CITES and other trade measures have had mixed effects on the quantities in trade of many species. In some cases trade has declined while in others there appears to have been little change. Where demand is elastic increased trade controls for one species can have a knock-on effect on the trade in other species used for similar purposes, as one is substituted for another. Where species occur in more than one range State, increased trade controls and therefore reduced exports from one country may be offset by increased exports from another. A further impact can be a shift in wildlife production from wild capture or collection to ranching, captive-breeding, cultivation and artificial propagation.

Conservation-motivated trade controls assume that trade is or is likely to be a major factor causing the decline in a species. However, many other factors may be equally or more important with respect to the conservation status of species in trade. Increased trade controls may be successful at halting or restricting the export of wild species, but will not necessarily address the root causes of decline with the result that their conservation impact may be limited. There are examples where increased trade controls have coincided with an increase in wild populations of species subject to harvest pressure, for example in the case of Vicuña. There are also examples, however, where this has not been the case, the most frequently cited of these being rhinos. Although it is possible to draw attention to the fact that some species have declined in the wild despite being listed in the CITES appendices, it is not similarly possible to know what the situation would have been without added international trade controls. Similarly, it is not possible in most cases to attribute improvements (or at least reduced rates of decline) in species' wild populations solely to international trade controls, as other factors, e.g. increased enforcement effort in range States or decreased demand, may also have played a role.

### **Impacts on people**

Despite the dependence of many rural populations on wildlife few attempts have been made to investigate the effects that restricting trade in wildlife can have on local livelihoods. In the course of this study very little documentation was found on impacts of wildlife trade controls on local livelihoods other than general statements relating to increased human-wildlife conflict and loss of economic incentives to conserve. Impacts on traders are likely to be more significant than on collectors since traders are likely to be more dependent on wildlife based-income, whereas

collectors are likely to include wildlife trade as one element of a diverse livelihood strategy. However, for some of the poorest groups, especially in rural areas, wildlife trade may be one of the few opportunities to generate cash income which, even in small amounts, can make a critical difference to livelihood security.

Much of the discourse around the issues of wildlife trade and livelihoods concerns apparently 'unnecessary' restrictions on the trade in what some argue are abundant - or at least not threatened - species. What is generally overlooked, but potentially more significant given the number of species involved, is the livelihood impact of declining availability of wild populations of species that are important for subsistence use or income generation. In this case, the negative impact on rural livelihoods could stem from too little trade control, not too much. This is especially the case where local efforts to manage a resource sustainably and for local benefit, including through export to foreign markets, are being undermined by external access or illegal extraction for foreign markets. Furthermore, trade measures such as CITES can help increase the transparency of international trade and thereby better inform those who are seeking to benefit from it.

A total ban on commercial international trade in wild species or wildlife products, whether as a result of national trade controls or CITES, can have rapid and significant impacts on the incomes of people dependent on access to external markets as a part of their livelihood strategies. For some species however, even if trade is banned outright, livelihood impacts are limited since the benefits of the trade have traditionally been captured by the state, or the trade is only a small part of a much wider livelihood strategy. In many cases there is insufficient information and/or widespread disagreement about both conservation and livelihood impacts - positive and negative - of trade bans.

There is an increasing tendency within CITES processes to create measures to allow trade in species for which there is conservation concern to continue where there is clear evidence that it will not be detrimental to wild populations, and, more specifically, is likely to be beneficial. Mechanisms to transfer species from Appendix I to Appendix II under ranching and quota schemes are examples of such measures. In some of these cases clear evidence can be seen for both conservation and livelihood benefits.

The general lack of information regarding the livelihood benefits of harvest for export of wild species precludes any quantitative assessment of the impacts on livelihoods of a shift in production strategies, which is often associated with increased trade controls, towards more highly managed and concentrated systems, e.g. captive breeding. However, such systems often result in a change in beneficiaries. Captive breeding programmes tend to be developed in consumer states rather than producer states and the benefits are thus captured by entrepreneurs in developed rather than developing countries. There is no requirement that source countries for species produced in non-range States benefit from captive breeding or propagation programmes; the issues of access to genetic resources and benefit sharing, which are at the core of the Convention on Biological Diversity (CBD), have yet to be addressed in any significant way within CITES. While ranching programmes retain a greater share of economic benefits within range States than captive breeding, benefits seem likely to shift away from the original primary harvesters to land owners or farmers.

### **Experience in Tanzania**

Experience from the East Usambara Mountains in Tanzania clearly shows a mixture of positive and negative monetary and non-monetary impacts resulting from changes to wildlife access and trade regulations at local, national and international levels. It is also evident that regulatory measures have varying impacts on different sectors of society due to the different roles in the wildlife trade played by the rich and poor, women, men, elders and youth. Men are most affected by regulations on the timber trade and youth most affected by regulations on the trade in wild animals. According to local perceptions, wildlife access and harvest regulations have had a greater overall impact than national and international trade controls. Further, evidence suggests that some trade regulations have actually led to significant

positive impacts on local livelihoods, whilst subsequent wildlife access regulations have caused the most negative impacts. Overall, wildlife access and trade restrictions in the East Usambara Mountains have had a significant financial effect on local people.

### **Do international wildlife trade controls result in a lose-lose for biodiversity and livelihoods?**

From the literature reviewed and the case study conducted in Tanzania, it is apparent that conservation-motivated international trade controls, and specifically those required under CITES, usually do not result in a lose-lose scenario for a number of reasons:

- In general, different forms of trade control have had a positive, or at least not a negative, impact on species conservation;
- The harvest for commercial export of wildlife products is generally only one component of a larger natural resource based livelihood strategy, and does not necessarily make a substantial contribution to rural livelihoods given current trade structures;
- For many wild species, the impacts of national level restrictions on resource access or trade and shifts in markets are far more significant than international trade controls;
- International wildlife trade restrictions are increasing in variety and flexibility, with expanding emphasis being given to livelihood concerns during debates in CITES; and
- In some cases, the absence of trade controls can result in a lose-lose scenario since over-harvest can have livelihood impacts in the form of the declining availability of resources for subsistence needs and trade based incomes.

Nevertheless, there are examples where international trade controls have reduced the income available to rural communities without bringing about any obvious conservation benefit. Such controls are likely to further undermine future efforts to improve local benefits from wild species through community-based management of wildlife resources.

### **Increasing the contribution of wildlife trade controls to sustainable development**

Discussion is increasing regarding the potential for CITES and other trade controls to be used as a tool to increase the livelihood contributions associated with trade in wild species. In the case of CITES, this reflects the evolution in thinking that has taken place between the agreement of CITES in 1973 and the CBD nearly 20 years later, in 1992. Although CITES and the CBD have a different emphasis and scope, they also have much in common, and do not conflict in their basic premises: that wild species are important to development, should be used sustainably, are best conserved at the local level and national level, and international co-operation is required in this regard. Key points of disagreement regard sovereignty of rights over decisions regarding the use of biological resources and the treatment of genetic resources. More fundamentally, however, CITES is essentially a conservation convention, while the CBD is concerned with the much broader goal of sustainable development.

Despite its conservation focus, CITES incorporates some valuable mechanisms that could be adapted to take into account socio-economic issues and enable the Convention to more effectively contribute to sustainable development. Realising the full potential of CITES as a tool for securing development as well as conservation objectives requires actions on a number of fronts:

- Sensitising the 'CITES community' and consumers to the livelihood issues associated with the international wildlife trade, and consumers and industry to the fact that CITES does not universally ban international trade.
- Modifying CITES decision-making processes to include consideration of livelihood issues by including



information on the socio-economic aspects of harvests and trade in significant trade reviews and the supporting statements of CITES-listing proposals, and considering that information when designing and recommending remedial measures.

- Avoiding blanket bans on trade without taking into account the differing status of national populations and management regimes, and considering 'split listing'.
- Expanding the linkages between implementation of CITES and the CBD including: increasing the attention paid to wildlife trade issues within CBD policy discussions and work programmes and within national biodiversity action plans developed under the CBD; developing national trade controls and reporting mechanisms that support both CITES and CBD objectives; using CITES to support the CBD through increasing the transparency of the international trade in wildlife resources, including the products resulting from the use of genetic resources, and to prevent unsanctioned export of genetic resources; and, where appropriate, to meeting conservation and livelihood objectives, increasing capacity for intensive management to increase production within range States.
- Ensuring that learning resulting from research on community-based wildlife management and NTFP development is brought into and informs discussions of and decisions taken regarding the international wildlife trade in order to increase the potential for achieving conservation and development aims.
- Examining the potential for synergy between CITES and voluntary certification and labelling schemes.
- Acknowledging that different stakeholder groups have different perceptions of the values of natural resources, that different priorities may have equal validity and that effective management needs to reconcile these perceptions and priorities.

#### **Further research requirements**

As this study showed, there are currently more questions than answers with regard to the contribution of the wildlife trade to rural livelihoods and the impacts of related trade controls. In order to address the lack of detailed information and increase the contribution of the wildlife trade to sustainable rural livelihoods, further research is needed in a number of key areas.

- Detailed case studies to determine the significance of wildlife trade to rural livelihoods compared to other uses of wildlife.
- Supply chain analysis to determine where gains and losses are made for different commodities and how supply chains might be modified to be more pro-poor.
- A systematic evaluation of CITES listing proposals submitted over time in order to explore the governance issues associated with CITES decision making processes.
- Case studies including livelihood impact analysis of trade regulations and the livelihood diversification strategies adopted by people confronted with trade restrictions including a comparative analysis of differential impacts along the supply chain.
- Comparative analysis of the various factors influencing the significance of livelihood impacts associated with trade controls including land tenure and resource access rights, different forms of trade regulations, enforcement, proximity to markets, foreign interest in locality/resource, etc
- Analysis of differential benefits and conservation impacts of alternative modes of production (e.g. captive breeding, ranching, cultivation) compared to wild harvesting.

## **ACKNOWLEDGEMENTS**

This study was made possible through funding provided by the Social Science Research Unit of the UK Department for International Development, whose support is gratefully acknowledged.

Thanks are due to a number of individuals who have provided advice, comments and inputs at various stages of this study including: Izabella Koziell, Josh Bishop and James MacGregor at IED; Steven Broad, Julie Gray, Kim Lochen and Majja Sirola at TRAFFIC International; Tom Milliken at TRAFFIC East/Southern Africa; Bernardo Ortiz at TRAFFIC South America; Peter Paul van Dijk at TRAFFIC Southeast Asia; Jon Hutton and Barney Dickson at Resource Africa; John Caldwell and Gemma Smith at UNEP-WCMC; Ruth Barreto and Frank Vorhies at IUCN - the World Conservation Union; Daniel Wilson and Martin Jenkins.

In Tanzania, we would like to thank the Tanzania Forest Conservation Group for their participation in this work, particularly through the efforts of Simon Masha. Community members from the villages in the East Usambaras who gave their time and experience to the study are gratefully acknowledged although not individually named for reasons of confidentiality.



## ACRONYMS

ANR	Amani Nature Reserve
CAWM	College of African Wildlife Management
CBD	Convention on Biological Diversity
CIFOR	Centre for International Forestry Research
CIS	Commonwealth of Independent States
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoP	Conference of the Parties
DI'D	Department for International Development (UK)
DRC	Democratic Republic of the Congo
ESA	Endangered Species Act (US)
EUCAMP	East Usambaras Catchment Area Management Project
FAO	Food and Agriculture Organization of the United Nations
FBD	Forestry and Beekeeping Division (Tanzania)
FINNIDA	Finnish International Development Agency
GDP	Gross Domestic Product
GNP	Gross National Product
IIED	International Institute for Environment and Development
IPPC	International Plant Protection Convention
ITC	Intra-African Trade Promotion Programme
LDC	Least Developed Country
NCAA	Ngorongoro Conservation Area Authority
NGO	non-governmental organisation
NTFP	non-timber forest product
NWFP	non-wood forest product
OECD	Organization for Economic Co-operation and Development
OIE	Office International des Epizooties
SHDC	Sustainable Harvest of Devil's Claw Project
SSM	Sikh Saw Mills (T) Ltd.
TANAPA	Tanzania National Parks
TWICO	Tanzania Wood Industries Corporation
TAWICO	Tanzania Wildlife Corporation
TAWIRI	Tanzania Wildlife Research Institute
TDL	Trophy Dealer Licence
UAE	United Arab Emirates
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNEP-WCMC	UNEP-World Conservation Monitoring Centre
WD	Wildlife Division (Tanzania)
WHO	World Health Organization

## INTRODUCTION

Many rural households in developing countries depend heavily on wildlife resources, both plants and animals, for subsistence purposes and income generation. Indeed, many rural households derive a significant part of their cash income from sales of wildlife products. In most cases this commercial trade in wildlife supplies markets within the country where the products originated. For some wildlife species and products, however, a significant segment (if not the majority) of products traded are ultimately destined for foreign markets.

Governments have implemented a variety of measures to control access to and trade in wildlife products both within countries and internationally, frequently citing conservation concerns as the driving factor behind such measures. An international agreement specifically aimed at reducing the threat to wild species posed by international trade was discussed by representatives of 88 governments in Washington DC in 1973, and the final text agreed and opened for signature. The resulting Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) currently has 156 Parties. CITES has had significant impacts on both domestic and international wildlife trade controls, which in turn have affected trade volumes and patterns.

Concerns have been raised that trade controls and resulting changes in the wildlife trade are having a negative impact on the livelihoods of those earning an income as a result of wildlife harvests, and specifically the rural poor. The most vocal objections have been raised in response to CITES prohibitions on the commercial trade in products from African Elephants that took effect in 1990. Some have argued that not only do such controls reduce the actual or potential economic benefits that could be realised from sales of wildlife products, but they also have little positive or even a negative impact on the conservation status of the species concerned.

Research examining the impacts of trade controls and specifically CITES has, to date, focused primarily on the effectiveness of these controls in reducing the threat to species posed by international trade. Although the attention surrounding the need to secure basic benefits for people living close to wildlife has been expanding since the early 1990s, far less research attention has been given to the impacts on livelihoods or national economics of conservation-motivated trade controls such as those required under CITES. This study was undertaken by the International Institute for Environment and Development (IIED) and TRAFFIC, with funding from the UK Department for International Development (DFID) Social Science Research Unit as a first step toward addressing this knowledge gap.

### Scope of this study

The wildlife trade is multi-faceted and encompasses many dimensions and scales. Wildlife may be sold and used locally, transported for sale in urban centres, sent across national borders to markets in neighbouring countries or shipped half way around the world. The trade involves thousands of species which are variously used for food, fuel, construction, healthcare, decoration, companionship and other purposes. Wildlife in trade may undergo no processing prior to sale to end consumers, e.g. live birds sold as pets, or be highly processed, e.g. medicinal plants used in pharmaceutical development. The number and characteristics of actors involved in the trade vary with the species and products involved. Trade chains between harvester and end consumer are often highly complex.

This study focuses on the impacts of regulations controlling the **international trade in terrestrial wildlife and wildlife products and the associated economic contributions of the trade to the livelihoods of first tier collectors and traders**. The regulations themselves may be international or domestic and may be focussed directly on the trade (e.g. export controls) or they may be more indirect controls (e.g. resource access or harvest restrictions), which nevertheless affect the ability of local people to export to international markets. A primary focus is placed on the assessing the impacts CITES, the **key international agreement** relevant to controlling the international trade in wildlife. However, as will be shown, the impacts of CITES cannot be considered in isolation of national level access

and trade controls, campaigning by NGO and industry groups, and/or changes in markets, which may or may not be linked to activities associated with the Convention.

'Wildlife' is used here to refer to all specimens of wild animal, plant and fungal species, both terrestrial and aquatic species, that continue to occur in the wild in a non-domesticated form, regardless of whether or not domestic varieties have been developed. This definition incorporates products classified as "non-timber forest products" (NTFPs), which have been defined by de Beer and McDermott (1996) as "all biological materials other than timber which are extracted from forests for human use", or, alternatively, as 'non-wood forest products' (NWFPs), defined by the UN Food and Agriculture Organisation (FAO) as "products of biological origin other than wood derived from forests, wooded lands and trees outside forests" (FAO 2001). However, the term 'forest' itself has no single definition, and NTFP/NWFP are increasingly applied to species (primarily terrestrial) from a variety of habitats. The majority of species covered by CITES can be considered NTFPs, and much of the wider literature on the commercialisation and trade of NTFPs would appear to be applicable to the trade in many CITES-listed species.

'Trade' is used here to refer to commercial transactions in goods between two or more individuals or entities. While recognising that the separation is somewhat arbitrary, the intent is to differentiate between the subsistence use of wildlife products and exchange of those products for goods, services and/or cash income.

'Wildlife trade' refers to the sale or exchange of physical products produced by and/or derived from wild species. Commercial transactions in conjunction with wildlife services, e.g. those associated with wildlife tourism, are not considered under the use of this term.

The trade in aquatic and marine species is not generally considered here. Relatively few of these species have thus far been covered by CITES (the reasons for which will be touched on briefly below), and these species are frequently subject to a different suite of national and international access and trade measures. The trade in timber species is similarly not covered in detail.

### **Structure of this report**

Part One of this report provides a global overview of trade-related issues. Chapter One reviews the importance of wildlife to rural livelihoods including an analysis of the types and uses of different wildlife products, the overall significance of wildlife resources and the significance of international trade as an element of wildlife use. Attention is focused on the direct economic returns from sales of wildlife products rather than national-level income, foreign exchange earnings, etc.. Chapter Two provides an overview of the international wildlife trade - its scale, the species and products in trade, the countries involved and the structure of wildlife trade supply chains. Chapter Three describes the different types of regulatory measures directed at controlling the international wildlife trade. These include domestic measures that govern resource access and use, transport and sales as well as international measures controlling international trade - of which CITES is the most significant. Chapter Four then examines the impacts of these measures in terms of changes in trade patterns and volumes, changes in production methods, changes in the conservation status of target and non-target species and impacts on rural livelihoods - financial and non-financial.

Part Two is a case study of three villages in the East Usambara Mountains in north-eastern Tanzania.

Chapter Five provides an overview of the wildlife trade in Tanzania - including the trade in timber, live and dead animals and medicinal plants, and introduces the case study site. Chapter Six describes current and historical patterns of wildlife trade in the three villages while Chapter Seven examines the effects that various regulations - domestic and international - governing resource use and access, harvesting and exporting have had on wildlife trade and the subsequent impacts in changes in the trade on conservation of target species and the livelihoods of resource-dependent communities. Chapter Eight concludes this section, providing a summary of the impacts and recommendations for follow-up work in Tanzania.

Part Three concludes the report. Chapter Nine addresses the research hypothesis on which this study is based - that conservation-motivated trade regulations can result in a lose-lose scenario for both conservation and rural livelihoods. Chapter Ten provides recommendations as to how regulations - specifically CITES - could be modified to move beyond a pure conservation agenda and to take socio-economic considerations into account in decision-making.

### **Methodology**

Research for this report was conducted in two parts. A desk-based review of available English language literature on the scale of the international wildlife trade, associated contributions to rural livelihoods and impacts of conservation-motivated trade controls was undertaken by IIED and TRAFFIC International. A number of brief case studies were prepared for a range of species subject to significant changes in trade controls within the past two decades.

In Tanzania, participatory research was carried out by TRAFFIC East/Southern Africa - Tanzania, the Tanzania Forest Conservation Group and IIED in three villages in the East Usambara Mountains to determine the importance of wildlife trade to local livelihoods and the impacts of trade restrictions. Two of the three villages border the Armani Nature Reserve, and one village borders the Mtai Forest Reserve. The villages remain anonymous in this report since information was gathered on sensitive issues including illegal trade and the purpose of the research was to understand livelihood dynamics rather than precipitate enforcement action. The three villages are referred to simply as A, B and C.

To achieve a background understanding and identify suitable villages, initial work focused on a review of existing literature and trade data, interviews with key stakeholders and wildlife department officials. The major part of the fieldwork was subsequently conducted over two periods in August and October 2001. Five villages were visited during the first trip and three during more detailed work on the second trip. The participatory rural appraisal techniques included interviews with key informants, community consultations, meetings with different stakeholder groups, transect walks, resource maps, ranking and matrix scoring exercises. These techniques were structured in a way that allowed four stages of analysis: stakeholder analysis, product analysis, financial analysis and livelihoods analysis. All currency conversions from Tanzania shillings (TZS) to US dollars (US\$) were made using average yearly exchange rates and US inflation correction rates. A more detailed field-based case study was undertaken in Tanzania, which generated primary data to test out and illustrate some of the issues raised by the desk study.

## PART ONE - OVERVIEW

### CHAPTER 1 CONTRIBUTION OF WILDLIFE PRODUCTS TO HUMAN WELFARE

Early human societies recognised the critical role that wildlife played in human survival, with stone age rock paintings depicting hunting scenes and species important for food and other uses. Wildlife continues to make a critical contribution to human welfare, not only to 'primitive' hunter-gatherer societies but also to 'modern' city dwellers. Wild species are used as sources of food, medicine, construction materials, fuel and other products. The end users of such products range from the person removing an animal or plant from the wild to someone half-way around the world. The fortunes of wildlife and people are intricately linked. As Bennett and Robinson (2000) note with regard to tropical forests, human socio-economic well-being is often dependent on good management of wildlife [animals] and other natural resources, while at the same time the survival of many animal species depends on better understanding and managing wildlife use.

*"The importance and value of wildlife in West Africa must not be underestimated. For all West Africans, wildlife is food; for some, it is the symbol of their culture; for others, it is their religion and even their identity." (Ntiama-Baidji 1987).*

Human use of wildlife has been the subject of increasing research over the last 30 years, especially with regard to the use of non-timber forest products (NTFPs). A recent review of research on NTFP commercialisation by the Centre for International Forestry Research (CIFOR) described the literature regarding use in the tropics as "massive, written in several languages by people representing professional and scholarly specialisations ranging from marketing to ethnography to genetics" (Neumann and Hirsch 2000). The scale of the literature is demonstrated by the results of IIED's Hidden Harvest project (Scoones, Melnyk and Pretty 1992), which identified almost 1000 documents dealing solely with the use of wild products as food.

Some of the earliest promoters of the need to pay more attention to the importance of wild species in meeting human needs were Robert and Christine Prescott-Allen. They noted that although many local and regional reviews of wildlife use had been conducted, there had been no overall assessment of wildlife use in developing countries. Their subsequent book *What's Wildlife Worth?* (Prescott-Allen and Prescott-Allen 1982) was intended to address this gap. According to the authors:

*"Wildlife can bring two types of economic benefit to developing peoples or countries. First, wildlife may be used directly as food, fodder, fuel or fibre. Second, that same wildlife may be sold, providing communities or countries with much-needed income. In some cases this income is a prominent item in national budgets; even where it is negligible in GNP terms it is generally important and sometimes vital for the communities most closely concerned with the trade."*

Jenne de Beer and Melanie McDermott also greatly increased the attention given to forest wildlife resources with publication of *The Economic Value of Non-Timber Forest Products in Southeast Asia* (de Beer and McDermott 1989; 1996). They characterised NTFPs as falling into the following categories:

- edible plant products: food, oils, spices and fodder
- edible animal products: terrestrial and aquatic fauna and animal products, e.g. birds' nests, honey
- medicinal products; includes plant as well as animal products, e.g. rhino horn; in many cases and cultures there is no firm boundary between medicinal and food use
- non-edible plant products; includes rattan and bamboo, ornamental plants, extracts and exudates, wood for fuel and construction, fibre and leaves.

- non-edible animal products. Includes insect products (e.g. wax and lac, from which lacquer and other products are made), other animal products (e.g. trophies, furs, feathers) and live animals.

Each of these categories includes subsistence as well as commercial uses and involves products bound for domestic as well as international markets.

De Beer and McDermott's work was followed almost immediately by that of Julia Falconer, with the FAO publishing *The Major Significance of Minor Forest Products* in 1990 (Falconer 1990), which similarly drew attention to the importance of wildlife products to rural livelihoods, this time focusing on West Africa. The UN Food and Agriculture Organisation (FAO) established a non-wood forest products (NWFP) programme in 1991 and began publishing a series of reports on various aspects of NWFPs several years thereafter. FAO considers NWFPs to be important to three main groups, which they characterise as:

- rural populations (the largest group) who have traditionally used these items for livelihood, social and cultural purposes;
- urban consumers (a smaller group but growing faster) who purchase these items; and
- traders and product processors, whose numbers in the NWFP sector increase as urban markets for these products grow (FAO 1995a).

As is indicated by the classifications of de Beer and McDermott (1989; 1996) and FAO (1995a), and the work of Prescott-Allen and Prescott-Allen (1982) and Falconer (1990), the use of wildlife products is both widespread and, if not universal, then very nearly so.

### **Subsistence use of wildlife products**

Wild resources play a major and very often critical role in the livelihoods of a high proportion of the world's population (Pimental *et al.* 1997). Numerous studies have found that it is often the poorest people and households that are most dependent on these resources (Prescott-Allen and Prescott-Allen 1982; Scoones, Melnyk and Pretty 1992; Arnold 1995; Neumann and Hirsch 2000; Nasi and Cunningham 2001).

According to Warner (1995), the degree of dependence of a community on wildlife products is determined by the condition of the resource, its proximity to the community, access rights and restrictions, local and external demand, and income earning options. Within a community, different groups rely on wild products to different degrees, and dependence is related to the availability of other household resources: land, livestock and so on. For those households with few other resources, dependence on wildlife products is likely to be high and income from them, while small, may represent the largest portion of household income (e.g. see FAO 1995b; Roe 2001).

Numerous studies have noted the importance of wild food products, which are of particular importance to women, children and the poor for whom securing access to such resources is important for sustaining their livelihoods (Scoones, Melnyk and Pretty 1992; FAO 1995a; Warner 1995; Cavendish 1997; Barnett 2000) although Clarke, Cavendish and Coote (1996) point out that the same cannot be said for big game in Africa, the household consumption of which increases with increased wealth. Some species are used on a daily basis while others are considered 'famine foods' and used only occasionally. Wild foods often fill a seasonal gap and are used when little else is available (Scoones, Melnyk and Pretty 1991).

Wild foods include fruits, mushrooms, nuts, leaves and starches as well as meat and fish. Owing primarily to species conservation concerns, particular attention has been focused recently on the use of wild animal species for meat.

According to Bennett and Robinson (2000), wild animals (including fish) contribute 20 per cent or more of the animal protein in rural diets in at least 62 countries. The use of wild meat varies by region and dietary custom. In West Africa, for example, there is a high level of consumption: wild animals account for 75 per cent of meat intake in Liberia (Bennett and Robinson 2000). In Ghana, an estimated 305 000 tonnes of wild meat are sold annually with a net value of approximately US\$275 million (Government of the Republic of Ghana 1998). In Côte d'Ivoire, an estimated 100 000 tonnes of wild meat were harvested in 1996, nearly twice as much meat as produced from domestic livestock (Caspary *et al.* 2001). A recent TRAFFIC study notes that reliance on wild meat is growing in East and Southern Africa in response to increased human populations and poverty; for example, 80 per cent of rural Kenyan households depend on wild meat for the majority of meat protein (Barnett 2000).

Wildlife in the form of trees and other plants also provides an important source of fuel for cooking and heating, especially in rural areas, with 90 per cent of woodfuel production taking place in developing countries (Bourke and Leitch 2000). According to FAO data, nearly 464 million m<sup>3</sup> of woodfuel were produced in Africa in 1998, of which all but a tiny fraction (less than one per cent) were consumed there. Nearly double that level was produced in Asia, 883 million m<sup>3</sup>, with consumption once again equaling over 99 per cent of total production (FAO 2001a). Fodder is considered the most important NWFP in the drier regions of continental and South Asia, and to be of great importance in the arid and semi-arid zones of Africa (FAO 2001b).

Wild species, both animal and plant, are also important components of traditional medicines, upon which an estimated 80 per cent of the world's population has been said to rely for primary health care (WHO/IUCN/WWF 1993). Prescott-Allen and Prescott-Allen (1982) estimated that 95 per cent of traditional medicines were plant-based. However, a variety of animal species are also used for medicinal purposes, ranging from Tigers *Panthera tigris* to Medicinal Leeches *Hirudo medicinalis*. Medicines are considered among the most important NWFPs throughout the world according to a recent FAO assessment of forest resources (FAO 2001c).

Wild plants are also an important source of materials for construction of furniture, housing, clothing, household utensils and ornamentation.

IIED's 'Evaluating Eden' project (Roe *et al.* 2000) noted that the dietary contribution of wild foods can be very significant in some locations. For example, in one area in the Northern Territory of Australia it was estimated that wild foods provided 46 per cent of energy intake and 81 per cent of protein. The economic contribution of wild foods can be equally important (in the same area the market replacement price of subsistence production represented 64 per cent of total income). In Canada's Northwest Territories, it is estimated that wildlife adds about 10 per cent to indigenous communities' incomes, and the average Inuit consumes about 200 kg per year of wild meat. Hunters in the Arctic earned CA\$10 000-15 000 (approximately US\$6700-10 100) from hunting, the replacement value of wild meat to Inuit households having been estimated to be more than CA\$7000 (approximately US\$4700) per year. Overall, in the Canadian north, the value of wild meat accounted for approximately one third of the entire cash economy and easily exceeded income from any other single source.



## Significance of wildlife resources to rural incomes

The lack of information on wildlife use in general makes it very difficult to estimate total and relative levels of wildlife use for domestic and commercial use (Burgess 1992). As noted by Wollenberg and Belcher (2001), "...only a small subset of forest products possesses potential for significant cash income and employment generation....The majority of these products have low cash values and are used for consumption, rather than for sale."

For some, however, wild products can be a significant source of cash income, particularly in marginal agricultural areas. Estimates of the number of people dependent on NTFPs for at least part of their income range from 200 million worldwide to 1 billion just in Asia and the Pacific (van Rijsoort 2000). According to Wollenberg and Belcher (2001), species with the most potential to contribute significantly to cash incomes include: some rattan and bamboo species, resins, bird's nests, various fruits and nuts and medicinal plants. Timber was considered one of the most valuable forest products, but one that was rarely available to local communities for income generation on any significant scale. The scale of income contributions from the sale of wild resources is indicated by the examples provided - see below.

The importance of the trade in NWFPs has been highlighted by the FAO, who note that "Traded products contribute to the fulfilment of daily needs and provide employment as well as income, particularly for rural people and especially for women" (FAO 2001c). In their review of the literature on the trade in wild meat in West Africa, Kasim and Long (2000) determined that cash income, e.g. from sales of products such as wild meat, would become increasingly important for paying school fees, taxes, etc. as rural communities entered the cash economy.

### *Income from wildlife products*

- |                     |   |
|---------------------|---|
| <i>Brazil:</i>      | <i>The sale of Babassu Palm <i>Orbignya martiana</i> fruit kernels supports over two million people (Scoones, Melnyk and Pretty 1992); A 1985 study showed that income from collection and processing of these kernels in northeast Brazil accounted for 39 per cent of cash income and 34 per cent of the total household income during the seasonal slack period for agriculture (May et al. 1985 cited in Wollenberg and Ingles 1998).</i> |
| <i>Cameroon:</i>    | <i>Cola nuts comprise between 5-37 per cent of households' cash income (Infield 1988).</i>  |
| <i>China:</i>       | <i>One kilogramme of Matsutake Mushrooms can earn a harvester more money than the average annual wage in Yunnan Province (FAO 1999a).</i>   |
| <i>Ghana:</i>       | <i>The collection and sale of wild meat realises an income similar to that received by government employees (Scoones, Melnyk and Pretty 1992).</i>  |
| <i>Guyana:</i>      | <i>Forest products account for 32 per cent of the economy of Assakato Village (Sullivan 1998).</i>  |
| <i>India:</i>       | <i>Ninety per cent of the population of the state of Manipur depends on forest products as a major source of income (Sial 1994).</i>  |
| <i>Kenya:</i>       | <i>In the Arabuko-Sokoke Forest, hunters can earn US\$275 per year by selling meat compared to an average per capita income in this area of US\$38 (Bennett and Robinson 2000).</i>   |
| <i>Philippines:</i> | <i>Rattan sales are particularly important in the household economies of the poor (Scoones, Melnyk and Pretty 1992).</i>  |
| <i>Zimbabwe:</i>    | <i>On average, wild resources comprise 35 per cent of total household incomes (Cavendish 1997).</i>   |

## Significance of international trade as an element of wildlife use

Given that a lack of data makes it difficult to estimate the overall significance of wildlife use to rural livelihoods, it is no surprise that it is even harder to identify the relative significance of international trade compared to other uses. Campbell and Brigham (1993) have attempted to do this for Zimbabwe (Table 1).

**Table 1**  
**Classification of non-wood forest products in Zimbabwe: their importance for various sectors and for trade at various scales.**

Type of product		Importance					
		Importance to sectors			Importance of trade		
		Large-scale sector	Small-scale sector Subsistence	Trade	Local	National	International
ANIMAL (domestic): FOOD	Meat	****	***	***	*	****	**
	Milk		***				
ANIMAL (wild): FOOD	Bush meat	*	*			*	*
	Insects		**	*	*	*	
	Fish		**	*	*	*	
	Honey	*	*	*	*	**	
ANIMAL (domestic): NON-FOOD	Hides, leather	***	**	*		*	**
	Traction		****				
	Fertiliser		***				
ANIMAL (wild): NON-FOOD	Tourism	****		**		*	****
	Hunting	***		**		*	****
	Live animals	**				**	
	Tusks, hides etc.	**		*			*
PLANT: FOOD	Fruits		***	**	*	*	
	Fungi	*	**	**	*	*	*
	Leaves		*	?			
	Nuts		*	*		*	
	Roots, tubers		*	?			
	Flowers		*				
	Bark, sap		*				
PLANT: FIBRE AND MATERIALS	Bark		***	*	*		
	Thatch	*	***	*	*		
	Reeds, wood		**	**	**	*	*
	Fertiliser		**				
	Live plants	*				*	
COSMETIC & MEDICINAL	Medicines		***	**	*	*	
	Toxins		*				
PLANTS: EXTRACTIVE	Dyes		*				
	Gums			*		*	

Key: blank = no value; \*\*\*\* = very valuable.

Source: Campbell and Brigham 1993.

Exploitation of wildlife for international trade involves far fewer species than subsistence use or domestic trade and is therefore likely to be less significant for the majority of rural communities. For some communities, households and individuals, however, collection or harvesting for export may be a full time occupation. 'Tapping' of the South African endemic aloe species *Aloe ferox* to produce aloe bitters for export dates back to the mid-1700s and currently employs

thousands of rural South Africans. Full-time tappers collect the majority of the export crop, which may approach 700 tonnes. Rural communities were estimated in a 1996 study to earn approximately R4 million (US\$1.2 million) from harvests for trade of this CITES Appendix II species (Newton and Vaughan 1996).

Most medicinal plants are traded in local or national markets; relatively few are traded internationally (FAO 1999). The international trade in medicinal and aromatic plants is still huge, however, with an average annual value from 1993-1998 of US\$1.26 billion, involving over 100 countries (Lee in prep.).

The international trade in rattan further illustrates the importance that international markets for wildlife products can have for rural livelihoods. Rattan is considered the most commercially and socio-economically important NTFP in Southeast Asia (de Beer and McDermott 1996) and the most important wildlife product in international trade in terms of its economic value, other than timber and fish (Fui and Noor 1994). A 1980 study estimated that at least a half a million people in Southeast Asia were involved in the collecting, processing and trade of rattan (Menon 1980, cited in de Beer and McDermott 1996). Rattan is used locally in Malaysia for subsistence purposes - for food, medicine, building material and fibre - and as a source of cash income. A 1990 study to determine the significance of rattan collection to the local economy estimated the number of rattan collectors to be 13 000 (compared to over 67 000 employed in the logging industry). The average monthly incomes of full-time rattan collectors ranged between US\$25-156 (compared to an average monthly wage of US\$120 for an agricultural worker). Rattan collection is traditionally undertaken by forest-dwelling Malaysian aborigines (Orang Asli) and, while the amount earned is not large, it is often the only source of cash income for these communities, who are amongst the poorest in Malaysia. It is an important livelihood activity, especially during the periods of the agricultural calendar when no other forms of income are available (Fui and Noor 1994).

There are numerous other examples demonstrating the economic significance of the international wildlife trade at the local level:

- In northeast Brazil, approximately 25 000 mainly local and indigenous people are involved in commercial collection of the leaves of *Pilocarpus* spp. for the production of a single compound, pilocarpine (Pinheiro 1997, cited in ten Kate and Laird 1999). This compound is used in western pharmaceutical products to treat glaucoma and xerostomia (dry mouth) (Sheldon, Bailek and Laird 1997; ten Kate and Laird 1999).
- The importance of medicinal plant harvests to rural economies in Nepal has been highlighted in numerous papers (e.g. Klein *et al.* 1996; Bhattarai 1999; Olsen 1999). Olsen (1998, cited in Olsen 1999) estimates that 470 000 Nepalese households are engaged in commercial collection of medicinal plants, the majority of these plants being exported to India (Bhattarai 1997).
- In Cameroon, it was estimated in 1990 that a third of the people from the Oku Mountain region supplemented their income by collecting bark from the CITES Appendix II species *Prunus africana* for export for manufacture into pharmaceuticals (Falconer 1990).
- In Cambodia, resin collection, primarily for export to Vietnam for use in the boat building industry, can earn families KHR150 000-200 000 (US\$38-50) per month: a substantial level of cash income in this country (Global Witness 2001).
- In Senegal, a 1992 study estimated that the harvest and sale for export of one thousand passerines (songbirds) a year would be worth CFA25 000 (US\$91), more than a farmer's estimated average agricultural income at that time of CFA20 000 (US\$73). Overall, it was estimated that 2400 trappers were involved in the bird trade (Edwards and Biteye 1992). 1.3 million birds were exported from Senegal in 1990.

- Wild bird exports from Guyana to the United States in 1986 had an estimated value of US\$1.4 million, equivalent to approximately 0.6 per cent of the total value of Guyana's exports for that year (Mulliken, Broad and Thomsen 1992). Export levies on wild bird exports contributed over 75 per cent of the budget of Guyana's Wildlife Service Division in 1990. The main collectors of wild birds were Amerindian men, the majority of whom took part in this activity, according to a trader association representative (Edwards 1992).
- In the Amazon estuary alone, brazil nut sales were worth US\$33 million in 1987 and palm heart *Euterpe* spp. sales nearly US\$300 million (Clay 1997a, b).
- In Latin America, hunting of big cats for the skin trade boomed between 1946 and 1970 as a result of high demand and correspondingly high prices. A Brazilian campesino could earn more from one Jaguar *Panthera onca* skin than from six months' agricultural income (Ojasti 1996).

#### **Rural income from the international wildlife trade in Argentina**

In Argentina, hunting is an important source of income for rural people. Over 1 000 000 Culpeos *Pseudalopex culpaeus* and Grey Foxes *P. griseus* were hunted each year for their fur in the late 1980s (Rabinovich et al., 1987, cited in Novaro 1993); skins selling for US\$10 each. Ranch workers were said to hunt 10-20 foxes per year, earning the equivalent of a half to a full month's salary (Novaro 1993). A combined annual average of approximately 41 000 skins of these two CITES Appendix II species were recorded in international trade from 1995-1999.

The skins of tegu lizards *Tupinambis teguixin* and *T. rufescens*, both CITES Appendix II species since 1977, are harvested for export primarily to the United States, where they are manufactured into cowboy boots and other products, and to Europe. Trade in these species is economically significant both at the national level, in terms of export revenues, and also at the local level. Tegu hunting has been an important source of income for the rural poor in northern Argentina where the returns from each skin can be the equivalent of a day's wage as a farm labourer (Fitzgerald, Chani and Donadio 1991; Jenkins and Broad 1994; Chani 1996). Argentina's export quota for 2001 was one million skins (CITES Notification No. 2001/41).

Although international trade in wildlife products can provide a significant source of cash income, the actual long-term livelihood benefits of increased commercialisation of wildlife products to the rural poor are less clear. In his examination of the socio-economic benefits and issues of NWFP use, Arnold (1995) has drawn attention to some of the potential negative consequences of commercialisation:

- "A number of studies demonstrate that the dependence of the poor on income from forest products is often at the expense of supplies for household use."
- "As quantities and values grow, urban traders and wholesalers tend to exercise closer control over their supplies by hiring people to collect on their behalf rather than buying from local gatherers....though the growing intrusion of organised trading systems into the rural areas as the value of forest products rises may create additional rural employment and income, it can also divert control and access from those who earlier benefited from the production and trade of these products."
- "Growth in trade of forest products also alters relationships and rights. As pressures on a resource rise, traditional rights of use tend to become circumscribed or removed."
- "In contrast to the major products traded and consumed domestically, which are mainly staples of everyday use, most forest products gathered for sale for industrial use face uncertain market prospects. The history of such 'extractive' products records that, once a product achieves commercial importance, industry seeks to bring production and production costs under control by replacing supplies from wild sources by plantation sources or by synthetics."

- *"It has been argued that, as demands for new forest products are emerging at the same time as others are declining, forest dwellers can maintain incomes from forest products by shifting from one to another. Much attention in recent years has also focused on ways of making trade in these products more remunerative and stable to producers. However, the balance of the available evidence suggests that the range of products marketable in any quantity is limited, and that, except in the also limited areas rich in exploitable resource, these markets are likely to provide at best short duration incomes, and that their low-input low-output nature makes them poor livelihood systems."*

The example of *Pilocarpus* spp., or 'jaborandi', harvests illustrates several of Arnold's concerns. Local collectors in the Guajajara reserve of Arariboia, a major centre for leaf collection, are said to have become "totally dependent on commercial plant extraction to the detriment of other aspects of their local economy and the general social welfare and psychological well-being of their community" (Davis 1993, cited in ten Kate and Laird 1999). Overharvest has resulted in the decline of wild *Pilocarpus* populations in some areas, and the chief buyer, the E. Merk Company, has undertaken commercial cultivation, which was expected to provide up to 80 per cent of total production by the late 1990s. Although plantation crops were initially hand-picked, thereby providing a source of employment, efforts were underway to increasingly mechanise this process. Efforts were also being made to synthesise pilocarpine on a commercial basis (Sheldon, Balick and Laird 1997). As Pinheiro (1997) notes, "should a large portion of the 25 000 people involved in wildcrafting jaborandi be put out of work by plantations, they might lose an important, and by now relied upon, source of income."

#### **Cultural significance of wildlife**

Although this section and the wider report focus on the economic contribution of wildlife to livelihoods, it is important not to ignore that wildlife use also has important social and cultural significance for many people. Sacred groves or forests with spiritual, cultural and religious value are a feature in many parts of the world (IIED 1994; FAO 1995a; Kothari, Pathak and Vania 2000) and wildlife can be implicated in reaffirming kinship ties within the community and with the land. In Australia, for example, "crocodiles might be valued simultaneously for their spiritual significance, as a familiar component of the landscape whose behaviour indicates seasonal change, as food and as a source of cash income" (Davies *et al.* 1999). Bennett and Robinson (2000) point out that, as a result of the cultural significance of wildlife, "people in tropical forests hunt even when they have alternative sources of nutrition or income. According to the FAO (1995a) "the intangible, non-economic roles of [wildlife] can be more important and even provide a foundation for the economic roles that development programmes usually address."

*"The relationship between the people of West Africa and wildlife is deeply entrenched in their traditions, cultures and religions. Certain animals may not be touched, killed or eaten by some groups of people because of religious or cultural beliefs. Such animals are considered sacred either because they saved the ancestors of that particular group of people in one way or another during wars, or the animals are believed to have the same ancestry as the people. Animals in a particular habitat may be regarded as sacred. For example, the people in a particular village are often forbidden to eat fish from the main stream that supplies the village with water and specific areas of vegetation, mainly watersheds, may be protected as sacred groves... Language, art, philosophy and social structure in Africa are also strongly influenced by their association with wildlife. This is demonstrated in folklore, proverbs, names and symbolism. The "deer" hunting festival of the people of Winneba in Ghana is a social fabric that holds the community together. It draws natives of Winneba back home every year for the celebrations, which involve the capturing of the Bushbuck *Tragelaphus scriptus* with their bare hands" (Ntiemoa-Baidu 1997).*

### **Research Requirement: increasing understanding of the relationship between the commercial wildlife trade and rural livelihoods**

In the course of conducting the literature review for this project, very few documents were identified that assessed the significance of the wildlife trade to rural livelihoods on other than a general or a localised scale, or that compared the relative contributions of wildlife harvests for subsistence use, local/domestic trade and/or international trade. As noted by the various authors below, there is an urgent need for better information regarding the contribution of consumptive use of wild species to livelihoods at all scales. Numerous studies have been initiated in terms of the potential for NTFP market development, but relatively few documenting the economic characteristics of the existing commercial trade.

- "What we know is fragmentary, incomplete and conceals the reality. Nowhere is it more serious than the social and economic dimensions of non-wood forest products and more particularly on employment and income aspects" (Nair 1994).
- "Despite recognition of the importance of NWFPs at the local, national and international levels, there is a serious lack of basic statistical information on NWFPs. Much of the existing information is only available in case studies carried out at the local level. Trade statistics, when they are compiled, do not always give a realistic picture and have to be treated with caution" (FAO 1999b). "There have been few studies of specific features of NTFP [non-timber tree product] trade" (Tomich 1996).
- "Despite the obvious contribution of wildlife to the socio-economic life in Africa, there are currently no comprehensive and reliable estimates on total supply, trade and consumption of wildlife in any African country...Accurate information on income accruing to local communities from the marketing of [skins, hides, bones, shells, horns] is not available for any African country" (Ndamao-Baidu 1997).
- "As NWFP uses and activities in the subsistence and small enterprise sectors escape the attentions of statistical recording systems, quantitative information on their magnitude and structure is very sparse. There is a great deal of descriptive information, generally concentrated in narrowly situation-specific accounts. Few analytical studies relate the use of forest products to household livelihood strategies, and even fewer have attempted to synthesise the information available" (Arnold 1995).

*"Whereas wood products have become major international commodities in modern times, non-wood forest products rank among the oldest traded commodities (Iqbal 1993). Ancient Egyptians imported gum arabic from Sudan for use in paints and the mummification process. International trade in sandalwood oil dates back to the 12th century" (FAO 1995a).*

### **Documenting the trade**

Any effort to describe the international wildlife trade must unfortunately begin with the recognition that this cannot be done with any accuracy. The trade is very poorly documented in terms of the species or products involved, trade volumes and trade values. The international trade in timber and fisheries products is relatively better documented than the trade in most other wildlife commodities, a reflection of the greater monetary value of this trade.

There are two main sources of data on the international wildlife trade: Customs data and annual reports compiled by Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Customs data include information on trade volumes and declared values upon export and import. These data are compiled by national governments and organised according to commodity types, most often using the Harmonised Commodity Description and Coding System (HS). Customs data provide information on levels of processing and overall trade volumes, but rarely on the species or number of specimens involved. Much of the trade data compiled by the UN Food and Agriculture Organisation (FAO) and the UN Conference on Trade and Development (UNCTAD) are based on Customs data and therefore have the same limitations. The International Tropical Timber Organisation compiles more detailed data for the trade in tropical timbers but again, these are often not specific to the species or even the genus level.

By virtue of CITES annual reporting requirements, the trade in CITES-listed species is relatively well documented. Information on the different species and the number of specimens reported in trade by CITES Parties is compiled by the UNEP-World Conservation Monitoring Centre (UNEP-WCMC) on behalf of the CITES Secretariat. However, the number of species covered by CITES is small relative to the overall number of wildlife species in trade. Furthermore, problems with the accuracy of CITES trade reporting mean that trade data are indicative rather than actual. CITES trade data are better for live animal specimens than for plants or for animal and/or plant products.

Cross-border trade in many regions is likely to circumvent CITES or other trade control measures, e.g. Customs controls, and therefore is not accounted for within either Customs or CITES data. By its very nature, illegal trade is also undocumented, with the exception of information available for seized shipments that is sometimes reported in the media and/or CITES trade data.

Although referring specifically to the trade in NWFPs, Iqbal (1993) summarises the situation with regard to the wildlife trade in general when he states:

*"Basic information...is seriously lacking...Trade statistics, as far as they do exist, are to be handled with much thought, as a very large volume of NWFP are being traded unregistered. Under-reporting or not reporting at all, double counting, grouping of NWFP among themselves and with other products, and the use of unrealistic prices are among the systematic shortcomings of these statistics. Such statistics, however, are a starting point to get information and at best can be considered as indicative only."*



## Scale of the international wildlife trade

As indicated earlier, timber and fisheries products dominate the international wildlife trade in terms of volume and value. Approximately one billion cubic metres of wood products (including pulp and paper, but excluding fuelwood) were exported in 1999 (FAO 2001a), with the total value of forest product exports (excluding fuelwood) during that year estimated at US\$132 billion (FAOSTAT 2002). According to FAO data, nearly 116 million m<sup>3</sup> of sawnwood were traded internationally in 1998 (FAO 2001a).

**Table 2**  
**Commercially significant NWFPs in international trade**

Category	Product
Food products	<b>Nuts:</b> brazil nuts, pine nuts, pignolia nuts, malva nuts, walnuts and chestnuts <b>Fruits:</b> jujube, sapodilla, ginkgo <b>Fungi:</b> morels, truffles, pine mushrooms <b>Vegetables:</b> bamboo shoots, osmunds, reindeer moss, palm hearts <b>Starches:</b> sago Bird nests <b>Oils:</b> shea nuts, bahassu oil, illipe oil Maple sugar
Herbs and spices	Nutmeg, mace, cinnamon, cassia, cardamom, Galanga, allspice, caraway, bay leaves, oregano etc.
Industrial plant oils and waxes	Tung oil, neem oil, jojoba oil, kemiri (candle, lumbang) oil, akar wangi, babassu, oricica and kapok oils Carnauba wax
Plant gums	<b>For food uses:</b> gum arabic, tragacanth, karaya, carob <b>Technological grade gums:</b> talha, combretum
Natural pigments	Annatto seeds, logwood, indigo
Oleoresins	Pine oleoresin, copal, damar, gamboge, benzoin gum, dragon's blood (Benjamin), copaiba oil, amber
Fibres and flosses	<b>Fibres:</b> bamboo, rattan, xateactap, aren, osier, raffia, toquilla straw products, cork, esparto, Erica and other broom grasses <b>Flosses:</b> kapok or silk cotton
Vegetable tanning materials	Quebracho, mimosa, chestnut and catha/cutch
Latex	Natural rubber, gutta percha, jelutong, sorva and chicle
Insect products	Honey, beeswax, lac and lac-dye, silk, cochineal, Aleppo galls, kermes
Incense woods	Sandalwood, gharu or aloewood [agarwood]
Essential oils	Various
Plant insecticides	Pyrethrum, derris, medang and peauk bong
Medicinal plants	Various
Wild plants	Various
Animals and animal products	Ivory, trophies, skins, feathers, eggs, butterflies, live animals and birds
Miscellaneous	bidi leaves, soap nut, Quillain bark, betel and cola nuts, chewing sticks, lacquer, dom nuts or ivory nuts

Source: Iqbal 1993, as cited in Iqbal 1995.

According to the FAO, 117 million tonnes of fish were produced via capture fisheries and aquaculture in 1998. Approximately one-third of fish (live weight equivalent) produced during this year entered international trade, with 20 per cent of exports coming from 'low-income food deficit' countries. The total value of fish and fishery product exports in 1998 was US\$51.3 billion, of which developing countries accounted for 50 per cent. FAO estimates that 36 million people, comprising about 15 million full-time, 13 million part-time and 8 million occasional workers, are employed in primary capture and aquaculture fisheries production (FAO 2000).

A 1993 study commissioned by the FAO (Iqbal 1993) identified approximately 150 NWFPs considered of major significance in international trade based on a preliminary review of available trade data and other references. A list of products identified is reproduced in Table 2. Relatively few of the commodity types identified by Iqbal are commonly thought of as being components of 'the wildlife trade', and most do not include species covered by CITES. Exceptions include wild animals and animal products, ornamental and medicinal plants and incense woods.

The scale of the annual international trade in more 'typical', if actually less common, wildlife products during the 1980s is illustrated by figures compiled by Fitzgerald (1989):

Live primates	40 000
African Elephant ivory	tusks from 90 000 elephants
Pelts from wild furbearers	15 million
Live birds	4 million
Reptile skins	10 million
Tropical fish	350 million
Orchids	1 million

More recent estimates for the trade in some CITES-listed taxa were provided by UNEP-WCMC (see box on following page).

The value of the international wildlife trade is even less well-documented than the quantities of specimens in trade. An estimate from the 1980s (not including timber and fisheries) of US\$4-5 billion per year has been credited to UNEP (1989, cited in Roth and Merz 1997), while Fitzgerald (1989) uses a figure of "at least" US\$5 billion for the wholesale value of products in trade. Iqbal (1995) provides a more recent estimate for the trade in NWFPs of over US\$11 billion. Broad (2001) calculated a value approaching US\$15 billion for all wildlife products - forest-related or not, climbing to nearly US\$160 billion if timber and fish are included (Table 3).

Although wildlife has often been considered under the umbrella of 'minor forest products', some species and specimens can command high prices. In Taiwan, the highest grade of agarwood, a fragrant resinous wood produced by some Indomalaysian tree species of the genus *Aquilaria*, can sell for US\$11 500/kg, and is now virtually unavailable (Barden *et al.* 2000). The retail price of a single Blue and Gold Macaw *Ara ararauna*, of which approximately 42,000 were traded internationally from 1981-1992, could be as high as US\$1200 in the early 1990s. Hyacinth Macaws *Anodorhynchus hyacinthinus*, the largest parrot species in the world, and bright blue in colour, were offered for sale for upwards of US\$8000 during the 1980s (Mulhiken and Thomsen 1995) - the price reflecting the fact that international trade in these very rare birds was banned both by range States and CITES.

Persistent demand for rare species such as Hyacinth Macaw (in CITES Appendix I since 1987) and common species that are nevertheless restricted in international trade in some way (for example, through national-level harvest or export controls, imposition of duties, etc.) collectively drive a widespread illegal trade in wildlife. The true size of the illegal trade is anyone's guess, and several have tried. One estimate states that the illegal component of the trade is US\$5-8 billion (UNEP 1998). Roth and Merz (1997) have claimed that the illegal trade in wildlife products is the

world's second largest illegitimate business after narcotics. However, the very nature of the illegal trade is such that no reliable data are available to support this assertion.

#### **Reported international trade in CITES-listed flora and fauna**

##### **Fauna (annual mean, 1995-1999)**

- Over 1.5 million live birds (250 000 App. II; 1-250 000 App. III)
- 640 000 live reptiles
- 300 000 crocodile skins (world trade is over 1-200 000 but mostly farmed)
- 1 600 000 lizard skins
- 1 100 000 snake skins
- 150 000 furs
- Almost 300 tonnes of caviar
- Over 1 000 000 pieces of coral
- 21 000 hunting trophies

##### **Flora (1999)**

- 19 million bulbs exported from Turkey
- Over 53 000 live wild-collected orchids exported from Central America and Vietnam
- Over 200 tonnes of dried orchid *Cibotium barometz* roots from Vietnam to the Republic of Korea
- 360 000 cacti 'rainsticks' exported from Chile and Peru
- 70 tonnes of *Aloe ellenbeckii* resin exported from Kenya to China
- Over 300 tonnes of *Aloe ferox* extract exported from South Africa
- 120 tonnes of Agarwood *Aquilaria malaccensis* chips exported from Indonesia and Malaysia
- 30 tonnes of American Ginseng *Panax quinquefolius* roots exported from the United States

Source: J. Caldwell, UNEP-WCMC in litt. to T. Mulliken, TRAFFIC International, 2001.

**Table 3****Estimate of the annual value of global international trade in wildlife in the early 1990s**

<b>Commodity</b>	<b>Estimated value US\$</b>
<b>Live animals</b>	
Primates	10 000 000
Cage birds	60 000 000
Reptiles and amphibians	6 000 000
Ornamental fish	750 000 000
<b>Animal products for clothing/ornament etc.</b>	
Mammal furs and fur products	750 000 000
Reptile skins	200 000 000
Reptile skin products	750 000 000
Mollusc shells	200 000 000
Ornamental corals	20 000 000
Natural pearls and products	90 000 000
<b>Animal products for medicine</b>	
Wild ungulate products for medicine (deer velvet, musk etc.)	30 000 000
Chelonian products	5 000 000
Seahorses	5 000 000
<b>Animal products for food (excluding fish)</b>	
Game meat	120 000 000
Frogs legs	60 000 000
Swiftlet nests	65 000 000
Edible snails	460 000 000
<b>Live ornamental plants</b>	
"Wild" plant trade	250 000 000
<b>Non-wood forest products (NWFP)</b>	
Global NWFP estimate (Iqbal 1995)	11 108 700 000
<b>Subtotal excl. fisheries food products &amp; timber</b>	<b>14 939 700 000</b>
<b>Fisheries food products</b>	<b>40 000 000 000</b>
<b>Timber</b>	<b>104 000 000 000</b>
<b>TOTAL</b>	<b>158 939 700 000</b>

Source: Broad 2001.

## Types and uses of products in international trade

Wild species are traded internationally in many forms in order to produce a wide variety of products. Major uses include:

- **Medicines** - Many medicines, both traditional and 'western', are based on wild plants or compounds extracted from them. Approximately 1000 plant species have been identified in international trade in East Asia alone (Lee in prep.), and 700 imported for use within Europe. The global international trade in medicinal and aromatic plants exceeded 440 000 tonnes in 1996, and was valued at US\$1.3 billion (Lange 1998).
- **Food** - Although most wildlife hunted or collected for use as food is consumed directly, i.e. used for subsistence purposes, there is a substantial international trade in a variety of non-timber forest products, well-known examples including brazil nuts, palm hearts, pine nuts, various mushroom species and spices. The trade in fisheries products dominates the food trade in animal species.
- **Ornaments and furnishings** - A wide variety of wildlife products are used for decoration and ornamental purposes, including ivory, coral, turtle and mollusc shells, reptile and other skins and feathers. Tourist items are often crafted from local wildlife, including jewelry and ornaments crafted from corals and shells, curios such as insects or other small animals encased in plastic and stuffed animals.

### **The Asian trade in tortoises and freshwater turtles**

The international trade in tortoises and freshwater turtles is vast, with a wide variety of species in international trade for use as food, in medicines, as pets or for ornamentation. The trade within Asia has increased dramatically in the last two decades with the opening up of Asian economies such as China, Vietnam and Laos (Compton 2000). The main trade pattern involves the collection of turtles in South and Southeast Asia for export to East Asia for use as food and medicines, with increased exploitation for trade depleting wild populations to the point that a growing number of species are threatened.

Subsistence use in Vietnam is believed to have declined in response to an increase in market values as a result of export to China, with softshell turtles also served in restaurants in Vietnam, providing a further incentive for collection and sale (Hendrie 2000). There is a long history of domestic use of turtles in Laos for food and/or medicine. However, as in Vietnam, most turtles collected in Laos are believed to be destined for export, mainly to Vietnam and China (Stuart and Timmins 2000). Evidence is growing of significant declines in turtle populations in both Laos and Vietnam.

In Bangladesh, Rashid and Khan (2000) report that turtles provide an important source of protein for tribal groups and some low income non-Muslims, and have long been collected for subsistence use. Harvest for commercial trade increased dramatically after independence (1971), reflecting increased local and commercial opportunities to exploit natural resources and the reopening of land transportation routes between Bangladesh and India. Turtles became a major export commodity in the mid-1970s. As a result of increasing demand and rising prices, subsistence collection has now largely been taken over by commercial collection involving fishermen, traditional hunters and professional collectors. It is estimated that 50 000 people are now involved in this activity full-time. The Government of Bangladesh earned approximately US\$600 000 per year in export revenues for turtle exports between 1981 and 1990. Serious concerns have been expressed regarding the status of turtle and tortoise populations in Bangladesh as a result of trapping and habitat deterioration, with 8 species considered 'Critically Endangered', 15 'Endangered', and 2 'Vulnerable' according to the IUCN-Bangladesh Red Data Book (Rashid and Khan 2000). Several species have been included in the CITES appendices, including several in Appendix I.

In North Sumatra and Riau, Indonesia, from which an estimated 25 tonnes of freshwater tortoises and turtles are exported each week, trapping has shifted from a full-time occupation to a source of supplementary income for fishers, farmers, plantation and other rural workers. The primary reasons given for this shift were a decline in prices and the increased difficulty of finding substantial numbers of turtles (Shepherd 2000).

- **Wearing apparel:** Skins, furs, feathers and fibres from many mammal, reptile, bird and fish species are traded internationally to make clothing, boots and shoes, bags and other items. These include expensive and high fashion items, e.g. shahtoosh shawls made from the endangered and Appendix I-listed Tibetan Antelope *Pantholops hodgsonii* as well as more widely available and legally traded products such as snake skin accessories (e.g. belts, wallets).
- **Pets/hobbies:** The increased availability of air transport around the world has greatly expanded the variety and numbers of wild species traded for use as pets or as hobbies. The international trade is dominated by reptiles, birds and ornamental fish, but includes invertebrate species such as scorpions and spiders. Imports of wild birds into the United States, once one of the main markets for CITES-listed species, have declined significantly as a result of increased import restrictions; imports of live reptiles have increased, however.
- **Ornamental plants:** A significant percentage of what are now considered common garden and indoor plants are the product of international trade that has been taking place for centuries. This includes many bulbous species e.g. snowdrops *Galanthus* spp. and crocuses *Crocus* spp., cyclamens *Cyclamen* spp., orchids, tree ferns, bromeliads, cycads, palms and cacti. Although much of the trade now involves artificially propagated plants, there are still millions of wild plants traded internationally each year, including a specialist trade in rare species.
- **Manufacturing and construction:** Forest products including timber, rattan and bamboo for furniture making, plant oils and gums, dyes, resins, latex, etc. are all traded internationally in large volumes.

#### **Key countries involved in the international wildlife trade**

Research on the NWFP trade undertaken by FAO (Iqbal 1995) identifies China as the exporter of the largest quantities of NWFPs, with other major suppliers being India, Indonesia, Malaysia, Thailand and Brazil. As can be seen from Annex 1, neither China nor India dominate the international trade in CITES-listed species, while Indonesia, by contrast, is a major wildlife exporter. According to Iqbal (1995), approximately 60 per cent of all NWFPs in trade are imported by the European Union, United States and Japan.

Table 4 lists the main importers and exporters of a number of commercially significant wildlife products, as identified by Iqbal (1995) based on an analysis of Customs data. Limitations of the data for this type of analysis should be borne in mind, however: for example, the HS Customs code for "other live animals" includes domestic (non-agricultural), as well as wild animals.

As can be seen clearly from Table 4, the general direction of wildlife trade flows is from developing to developed countries. It should also be noted that amongst those countries for whom wildlife trade is commercially significant are included some of the poorest countries and some of the countries richest in biodiversity resources (see Annex I). Wildlife trade presents both a threat and an opportunity to some of these countries. While wildlife products are rarely factored into estimates of contributions to national GDP (Nasi and Cunningham 2001) they make significant contributions to household economies in certain countries (as discussed above) but at the same time wildlife trade is listed as a significant threat in some of the biodiversity hotspot countries such as Madagascar, Indonesia and Malaysia (Conservation International 2001).

**Table 4**

**Major sources and markets for some commercially significant NWFPs**

Product	Declared import value (US\$ million)	Major source	Major markets
Plants used in pharmacy, perfumery, as insecticides and fumigants	1112 (of which ginseng roots are 389, liquorice roots 33)	China, Korea, USA, India, Chile, Egypt, Argentina, Greece, Poland, Czech Rep, Hungary, DRC, Albania	Japan, USA, EU, Malaysia
		Ginseng - USA, S. Korea, Canada, China <sup>1</sup>	Ginseng - Japan, China, Taiwan, Singapore, EU
		Liquorice - China, Pakistan, Syria, former USSR, Turkey, Afghanistan, Iran	Liquorice - USA, Japan, EU
Nuts	593		
	44	Brazil nuts - Brazil, Bolivia, Peru	Brazil nuts - USA, UK, Germany, Canada, Australia,
	216	Walnuts - Afghanistan, Pakistan, China, India	Walnuts - EU, Japan, Canada, Switzerland
Essential oils	421	China, India, Indonesia, Brazil	EU, USA, Japan
Cork	329	Portugal, Spain, Morocco	EU
Natural honey	268	CIS, China, USA, Mexico, Turkey	Germany, USA, UK, Japan
Gums and resins	194 <sup>2</sup>	Gum arabic: Sudan, Nigeria	USA, UK, Europe, Japan
Live animals	184	Various depending on species	Various
Spices	176	Indonesia, Grenada, Sri Lanka, Seychelles, Madagascar	USA, Europe, Japan
Bamboo and rattan	157	Southeast Asia, China	Europe, USA, Egypt, Japan, Thailand
Ivory <sup>3</sup>	28	Africa	Japan

<sup>1</sup>Was reversed in Iqbal, believed to be in error.

<sup>2</sup>Of which gum arabic is US\$101 million.

<sup>3</sup>Iqbal (1995) does not cite the source of his ivory data but this figure is presumably prior to the international trade ban (1989).  
 Source: Iqbal (1993) and Iqbal (1995), compiled from UNCTAD trade data and other information.



## Structure of wildlife trade chains

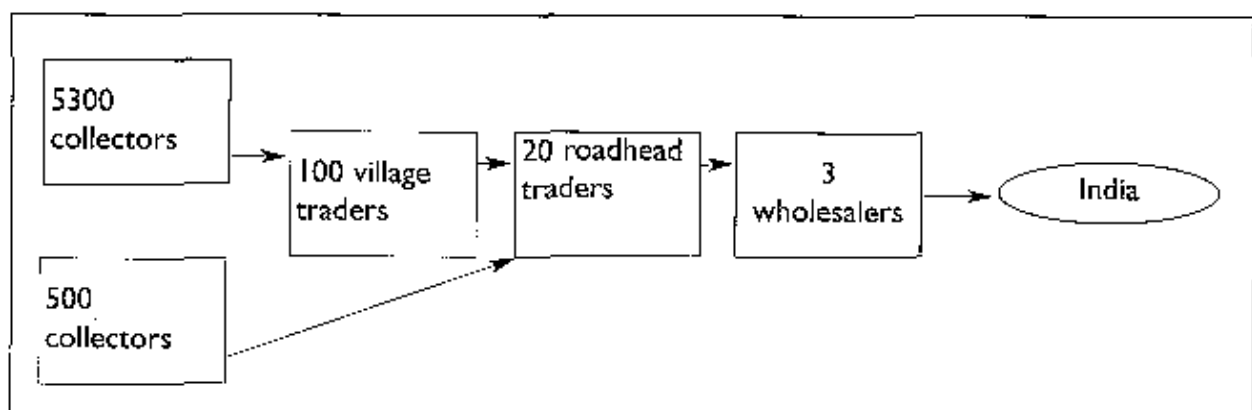
The journey of any given wildlife product from the collector at source to the final consumer can involve a wide range of intermediaries. While wildlife trade is often perceived as a predominantly rural activity, the urban dimension should not be underestimated. Barnett (2000) found that in Eastern and Southern Africa, complex rural to urban supply networks have developed for the wild meat trade, which is driven by urban demand and lucrative prices. Kasim and Long (2000) similarly comment on the importance of urban markets, stating that there is evidence that much of the commercial trade in wild meat is in the hands of urban-based entrepreneurs who sub-contract rural hunters, adding that wild meat sales have moved beyond local urban markets to the international arena.

Warner (1995) describes the concessionaire system frequently used in the past in Asia, where collection and marketing of high value wildlife products for export or processing was often under a government-granted concession system, with the concessionaire having the right to sell all of a specified product that was collected from a designated area. This is the system that currently exists for collection of edible birds nests. The concessionaire would need a number of collectors to ensure an adequate supply of the product, and these collectors would often trade the collected products to the concessionaire for food and manufactured goods. If the collectors were in debt to the concessionaire (a common occurrence), the concessionaire could easily enforce product collection and hence maintain supply. Warner notes that this form of "debt bondage" is now decreasing in the Asia-Pacific region as the concessionaire system is being restructured or eliminated and as collectors increasingly form co-operatives and associations.

Even in systems where there is no concessionaire, few products are sold directly from collectors to wholesalers or processors because of the small quantities involved. Middlemen – often local traders – are generally involved and handle storage, transport and other aspects of trade. Edwards (1993) has described the trade chain for the export of medicinal plants from eastern Nepal to India, noting the involvement of a series of middlemen between collectors and final buyers in India, with the relatively small number of Terai-based wholesalers exerting the main influence over prices received by harvesters (Figure 1). Village traders were noted as providing an important marketing service to collectors, e.g. transport and provision of credit.

Figure 1

Supply chain for trade in medicinal plants from East Nepal to India



Source: Edwards 1993, as depicted in Warner 1995.

The live bird trade in Tanzania usually has from two to three tiers (trappers, middlemen and exporters) with some trappers selling direct to exporters (Moyer 1995). A three-tiered system is also described by Edwards (1992) with regard to the live bird trade in Guyana, where the majority of trappers were Amerindians. Trappers in Guyana are said to receive only a small share of the export value of wildlife, e.g. US\$10 for a Rainbow Boa *Epicrates cenchria* (CITES Appendix II), which might be worth US\$170 in markets in Georgetown (van Bruegel 1998, cited in Andel and Reinders 1999). The accuracy of these figures is questionable, however, given that the average US retail price of this species in 1996 was US\$342 according to Hoover (1998) - the mark-up between dealers in Guyana and sale in the United States would be expected to be much higher. According to Parsaud (2001), head of Guyana's Wildlife Division, Amerindians are not directly involved in the export of wildlife, which is dominated by seven or eight exporters, and are "being fleeced all the time", with a lot of them "being owed monies". Potential reasons for their lack of participation in the export process included the remoteness of their communities or presumed lack of knowledge of the business.

**Profits from wildlife trade: luxury goods for some, vital provisions for others**

A study in central Vietnam provides interesting insights into the structure and dynamics of the wildlife trade in that country. Large and medium-sized traders tend to be Kin, the dominant ethnic group in Vietnam. Some are big enough to employ workers to collect and/or transport wildlife and to own transport. Smaller traders tend to be family-based businesses with more limited forms of transport. Both types of traders tend to be urban-based and use the cash income from wildlife for "status symbols such as new motorbikes and karaoke machines".

Wildlife hunters tend to come from traditional, rural communities and either sell direct to the urban traders or to middlemen. While still an important source of income, for these people, wildlife is often traded for food - particularly after poor harvests or at the end of the season, when food stores have been depleted. There is thus a high level of dependence by the hunters on the traders for vital provisions.

Source: Woodford 1997.

As described by Neumann and Hirsch (2000):

*"the structure of relationships between collectors, middlemen, traders and wholesalers can be highly complex, involving various elements of exploitation, risk, co-operation, collusion and resistance...the character of these relationships can shift through time, from locale to locale and at different points along the marketing chain....Lack of access to information, transport, credit and storage facilities combine to keep collectors at a great disadvantage in the market place. And these conditions provide plenty of opportunities for intermediaries to position themselves as almost unavoidable links in the marketing chain."*

Shortening the supply chain is often seen as the answer to increasing income to collectors. However, as noted by Edwards (1993) with regard to the medicinal plant trade in Nepal, intermediaries also perform many vital functions including transport, packing and risk taking. Removing intermediaries would expose those with little resilience to a volatile industry. As Warner (1995) points out, middlemen are often perceived as being the villains, but the value of the services they provide should not be underestimated. If they are removed from the marketing chain then the services

*In Namibia, under the Sustainably Harvested Devil's Claw project (SHDC), harvesters are organised into groups which are provided with scales and storage facilities. This enables them to store commercially viable quantities of tubers at central points for collection by an exporter. There is thus no need for a middleman and the harvesters are paid directly by the exporter at premium prices - NA\$12/kg (US\$1.06/kg) compared to NA\$1.8/kg (US\$0.09-0.70) via a middleman. (Cole and du Plessis 2001).*

provided must be met from some other source. In the case of Nepal's medicinal plant trade, Edwards (1993) has recommended the formation of marketing collectives to increase the ability of collectors to access market information and sell direct to road head traders. Olsen and Helles (1997) recommend the establishment of credit facilities and support to road-head traders to sell direct to India, as well as public dissemination of market information.

In some cases, intermediaries add little or no value and simply capture a little (or a lot) of the income from the sale of wildlife. In the Tanzanian villages visited as a part of this study, village middlemen pay trappers only 50 per cent of what they themselves receive from city-based traders, yet have few costs. Since the majority of species are collected to order, they do not have significant risks such as paying collectors before they themselves are paid.

#### **Research Requirement: Supply chain analysis**

Warner (1995) notes that while there are many case studies of supply chains at the community level, there is little information about the trade chain after the product leaves the community or initial middleman and before it arrives at the processor or final consumer. Different commodities in trade have different production costs along the supply chain, including that of acquiring a harvesting permit, direct harvesting costs, processing, transport and marketing costs, profit margins made by various intermediaries, etc...

Examples of price differentials along the supply chain include:

**Coral Beauty (ornamental fish) (Source: Banquero 1999)**

Collector US\$0.30                      Exporter US\$3                      Retailer US\$35

**Neotropical parrots (Source: Thomsen and Brautigam 1991)**

Trapper US\$2.50-65 (av US\$23) Middleman US\$5-650 (av US\$84) Retailer US\$37.5- 9000 (av US\$1204)

**Parrots from Irian Jaya, Indonesia (average price) (Source: Swanson 1992)**

Trapper US\$2.57                      Trader US\$7.09                      Exporter US\$49.43                      US importer US\$256

Detailed supply chain analysis is required to determine where gains are made for different commodities and how supply chains might be modified to be more pro-poor. All such analyses should include consideration of purchasing power parity - US\$1 has much greater significance to a remote trapper than to a US-based retailer, and so a direct comparison of prices distorts the real significance of benefits along the supply chain.

### National restrictions

#### *Restrictions on international trade*

Governments have almost certainly been seeking to restrict the movement of saleable goods, including wildlife products, for as long as there have been governments and saleable goods. As is still often the case today, many early trade controls were established to achieve economic objectives - the ban on the export of silkworms and eggs from what is now China, for example, in order to maintain a monopoly on silk production. These controls were generally unilateral in nature, either to protect the means of production, as in the case of silk, or to secure tax revenues, e.g. the 'portoria' imposed on goods imported into ancient Rome (Long 1875). Interestingly, some early trade restrictions involved genetic resources, e.g. silk worms and the seeds of the anti-malarial producing tree *Cinchona* spp., rather than raw materials or finished products, a precursor to concepts subsequently embedded within the Convention on Biological Diversity (CBD), agreed in 1992.

Until recently, trade restrictions imposed for the purpose of protecting species in trade were much less common. An exception is provided by the US *Lacey Act* (1900), which was prompted in large part by the domestic trade in feathers for use in the fashion industry and which, as well as establishing controls on domestic trade in native animal species, banned the import of wildlife (animal) products taken in violation of any foreign law. The United States was therefore one of the first countries to act on the belief that wildlife consumers have a role to play in supporting the implementation of the wildlife trade controls of exporting countries. The *Lacey Act* also contained a provision to limit imports of wild species deemed to be a threat to agriculture.

As the following examples indicate, national-level wildlife export restrictions for the stated purpose of species conservation grew in number during the mid-1900s:

- 1960 - the Government of Australia banned exports of live fauna;
- 1967 - the Government of Brazil banned virtually all wildlife exports;
- 1970 - the Government of Venezuela banned all hunting and trade of primates, song birds and 'ornamental' birds;
- 1972 - the Government of India banned hunting and trade of numerous animal and plant species; in 1991, all trapping and trade of live bird trade was banned
- 1977/8 - the Government of Kenya banned hunting and trade in wildlife products;
- 1983 - the Government of Ecuador banned all commercial exports of wild flora and fauna.

Legislation regarding imports also continued to evolve. In Australia, strict laws restricting imports of exotic animals and plants have been adopted in order to protect native wildlife and agriculture from the effects of introduced species and disease. Passage of the US *Marine Mammal Protection Act* (1972) made it illegal to take, sell or import any marine mammal product, including seals and sea lions, cetaceans, Polar Bears *Ursus maritimus* and Sea Otters *Enhydra lutris*, with limited exceptions allowed with regard to use by Alaskan natives for subsistence and handicrafts. Agreement of the US *Endangered Species Act* (ESA) the following year established import controls for species included within the lists of endangered and threatened species accompanying the Act.

National level trade controls in native and exotic species continued to evolve for a variety of reasons and independently of international conventions. For example, concerns regarding animal welfare began to be incorporated into legislation. In 1983, the European Union banned imports of the skins of Harp Seal *Phoca groenlandica* and Hooded Seal *Cystophora cristata* pups under *Council Directive 83/129/EEC*, with the exception of products resulting

from traditional hunting by Inuits. This was followed in 1991 by *Council Regulation (EEC) No 3254/91*, which called for a ban on imports of skins and some manufactured products of certain species trapped in countries allowing the use of trapping methods (e.g. leghold traps) that did not meet 'international humane trapping standards' effective 1 January 1995. Implementation of this regulation was delayed, however, in conjunction with debates over what constituted humane trapping standards.

Taking an entirely different approach, the Government of Namibia announced a ban on the export of native live animals in 2001, including several antelope species and live reptiles. In implementing the ban, they cited the importance of wildlife to the country in terms of tourism, hunting and other forms of utilisation, and the need to "make sure Namibia remains competitive in this regard" by ensuring that it was a unique destination for seeing certain species (Anon. 2001).

In many countries, health regulations may also restrict or prevent the movement of wildlife specimens and live animals. For example, in Botswana and Namibia, veterinary fences control the movements of both wild and domestic animals in order to prevent disease in commercially valuable (non-indigenous) cattle herds.

### ***Restrictions on access to and/or harvest of wildlife resources***

Governments frequently seek to impose **resource access** or **harvest** controls either in isolation of, or in combination with, export controls. The goals of such controls are often two-fold: first, to ensure that harvests are conducted in a manner consistent with government resource management and/or conservation objectives; and second, to achieve financial objectives, e.g. revenue generation through fees or taxes. Such controls can take a number of forms and affect a variety of wildlife, e.g. full harvest bans, harvest allowed under permit (permits may be specific to species, number, age and/or sex of specimens, location where harvest is to take place or period during which harvest may take place), harvest limited to designated areas (alternatively, no harvest allowed within designated areas, e.g. protected areas), granting of concessions, imposition of fees and royalties, etc. There are also often requirements beyond permitting, e.g. that wildlife harvesters be licensed and/or otherwise registered with the government. Harvest controls are likely to be in place for all but the commonest of species, such as those regarded as pests, e.g. some rodent species and birds such as *Quelea quelea*.

According to Arnold (1995), the majority of NWFP resources upon which rural dwellers depend come from land that they do not own, e.g. land in private hands or controlled by private concessionaires. He adds that numerous examples exist of increased restrictions on access to wildlife resources on private land being a direct response to the increased market value of those resources. Warner (1995) notes that efforts to increase control over timber production, e.g. through logging bans, could simultaneously close access to forest areas for gathering of other forest products.

There are often also regulations affecting the domestic trade in wild species, especially fauna, with use of some species limited to subsistence, while others are allowed in commercial trade. These may include requirements for obtaining transport permits or other documents showing chain of custody as well as licences to sell. Arnold (1995) comments that governments may choose to restrict the sale and transport, rather than the harvest, of wildlife resources as a means of ensuring resource conservation as these are easier to control. Traders may also be subject to a variety of government requirements related to engaging in commerce in general, e.g. sales controls, that are unrelated to the wildlife per se. As will be shown in the case study presented in Part Two, limitations on access to wildlife resources often have far greater livelihood impacts than do limitations on access to foreign markets.

## Multilateral agreements

Multilateral agreements in support of species conservation date back to the early 1900s, with an initial focus on bird species. The Convention for Protection of Birds Useful to Agriculture was agreed among a number of European countries in 1902. The governments of the United States and the United Kingdom (on behalf of Canada) subsequently adopted the Migratory Bird Treaty (1916), which established restrictions on the hunting of migratory bird species native to both countries. The treaty is implemented in the United States under the *Migratory Bird Treaty Act* (1918), which prohibits the hunting, taking or sale of most native bird species, certain 'game' species being exempted.

The London Convention Relative to the Preservation of Fauna and Flora in their Native State (1933) entered into force in 1936, and involved bird as well as mammal (and even plant) species. It was agreed by several European governments with a colonial presence in Africa (e.g. the United Kingdom, Belgium), as well as the governments of South Africa, Egypt and 'the Anglo-Egyptian Sudan'. Its focus was on protecting species of value for hunting and establishing protected areas within Africa (de Klerk and Shine 1993), with the specific objective of preventing extinction "or permanent injury" of species included in its two annexes. Species in the first annex were offered nearly complete protection from hunting and trade, and hunting and trade of those in the second was subject to regulation. The Convention contained provisions for regulating the international trade in trophies in order to ensure that they were taken according to the rules established for hunting, including the presentation of a certificate to this effect. This structure and requirements were not all that dissimilar to those subsequently included within CITES. The Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (1940) also contains provisions regarding the international trade in endangered species, however, there is no agreed list to which these provisions apply, the list instead being a composite of lists submitted by individual Parties (de Klerk and Shine 1993).

A precedent for wider multilateral action with regard to wildlife import controls was set with the establishment of the Office International des Epizooties (OIE), or World Animal Health Organisation, in 1924. An international veterinary organisation, its mission is to facilitate intergovernmental co-operation to prevent the spread of contagious diseases in animals between countries. OIE provides recommended minimum standards, rather than standards codified in international law, with the understanding that such standards "will usually go unchallenged if applied as import requirements" (USDA undated). The establishment of OIE was followed by the development of the International Plant Protection Convention (IPPC), agreed in 1951 and ratified in 1952. The IPPC appears to have been the first widely-implemented agreement aimed to control the international movement of wild species. Although the focus is on micro-organisms (viruses, bacteria, fungi) that cause crop diseases, IPPC also covers invasive plant species. Aimed primarily at protecting agriculture and economically important plants, e.g. timber species, the implementation of IPPC also helps to protect native wildlife and ecosystems from the introduction of species and disease. The IPPC was recently amended to bring it into line with the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) of the World Trade Organisation, with the potential for the agreement to benefit ecosystem conservation having received increased attention.

Several international conventions concerning marine mammals were agreed in the 1940s and 1950s, their ultimate objectives being focused more on use than on conservation. The International Convention for the Regulation of Whaling, agreed in 1946, has as its purpose "to provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry" (IWC 2002). The Interim Convention on Conservation of North Pacific Fur Seals, agreed in 1957, was even more focused on use, with the following objective:

*"...to take effective measures towards achieving the maximum sustainable productivity of the fur seal resources of the North Pacific Ocean so that the fur seal populations can be brought to and maintained at the levels which will provide the greatest harvest year after year, with due regard to their relation to the productivity of other living marine resources of the area".*

The Convention was agreed by the Governments of Canada, Japan, the former USSR and the United States.

## Overview of CITES and CITES-related trade controls

Although the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is clearly not the earliest international agreement controlling trade in wild species, it is certainly the most well-known.

Wjinstekers (2001) provides a detailed review of the "evolution" of CITES. Formal discussions of the need for importing countries to restrict imports in accordance with the trade controls of exporting countries were first held during the Seventh IUCN General Assembly in 1960. In 1963, the General Assembly passed a resolution calling for the development of an "international convention on regulation of export, transit and import of rare or threatened wildlife species or their skins and trophies". As Wjinstekers (2001) notes, "the limited scope of this resolution may be at the origin of the later title of CITES, which gives the wrong impression that it only concerns trade in endangered species."

Discussions continued and a draft Convention and preliminary list of species were discussed at subsequent IUCN General Assemblies. Following a recommendation adopted during the 1972 UN Stockholm Conference on the Human Environment, the final text of the Convention was discussed and agreed by representatives of 80 countries in February/March 1973 and CITES came into effect 1 July 1975. Although viewed by some as a 'northern' Convention, it is interesting to note that only 4 of the first 20 signatories are OECD-member countries. There were 156 Parties to CITES as of March 2002.

Unlike the Convention on Biological Diversity (CBD), CITES does not have clearly stated objectives *per se*. However, the goals of the Convention are articulated in its preamble:

*The Contracting States,*

*Recognizing that wild fauna and flora in their many beautiful and varied forms are an irreplaceable part of the natural systems of the earth which must be protected for this and the generations to come;*

*Conscious of the ever-growing value of wild fauna and flora from aesthetic, scientific, cultural, recreational and economic points of view;*

*Recognizing that peoples and States are and should be the best protectors of their own wild fauna and flora;*

*Recognizing, in addition, that international co-operation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade;*

*Convinced of the urgency of taking appropriate measures to this end; Have agreed as follows:*

This, and the trade controls established by CITES, carry with them the implicit assumption that Parties will act to ensure that native species are protected. Specifically, Parties are required to ensure that exports of species covered by the Convention are maintained within levels that do not threaten species survival and that species considered to be endangered are not imported for 'primarily commercial purposes'.



## The scope of CITES

By acceding to CITES, Parties agree to place controls on international trade in species that are listed in any of the Convention's three appendices:

**Appendix I** includes species that are considered by the Parties to be threatened with extinction. International trade is generally prohibited, however, exceptions are made, e.g. in the case of zoological display, research and sport-hunted trophies, as long as the export is deemed not detrimental to the wild population and the import to be for other than commercial purposes. Trade in Appendix I species requires prior issuance of an export permit by the CITES Management Authority in the country of export and an import permit by the CITES Management Authority in the country of import.

**Appendix II** includes species that are not necessarily threatened with extinction but that might become so unless trade is closely controlled. It also includes species (sometimes known as 'look-alike species') that are not of conservation concern, but which resemble other CITES-listed species so closely that their trade needs to be regulated in order to assist trade control measures for the more threatened species. International trade in Appendix II species must be maintained within sustainable levels and accompanied by CITES export permits.

**Appendix III** includes species for which a Party considers the co-operation of other countries to be necessary to prevent unsustainable or illegal trade in native species. Parties can unilaterally include native species in this Appendix. Trade in Appendix III species requires issuance of a CITES permit if exports take place from the listing Party, or a certificate of origin/re-export if from other Parties.

CITES-listings may be further defined via annotations, which, for example, may include or exclude certain types of specimens (such as parts of a plant). Species may also be "split-listed", having, for example, some subspecies or populations listed in Appendix I and some listed in Appendix II. This is currently the case for African Elephant *Loxodonta africana*, for example.

The initial list of species covered under CITES was agreed at the plenipotentiary meeting in 1973. A relatively high proportion of these species were 'charismatic megafauna', e.g. large cats and pachyderms (elephants and rhinos). Concern for the status of less charismatic but heavily traded species, e.g. Nile Crocodile *Crocodylus niloticus* and American Alligator *Alligator mississippiensis* was also demonstrated. The entire orchid family Orchidaceae spp. was listed to prevent misdeclaration and 'laundering' of species of concern by passing them off as similar looking, but more common species.

CITES Appendix I currently includes over 800 animal and plant species, while Appendix II contains over 4000 animal species and around 25 000 plant species (examples are provided in Table 5). Perhaps as telling as what is included in the appendices, e.g. high profile mammal species, is what is *not* included, e.g. a number of commercially valuable timber and marine fish species for which there is considerable evidence of trade-related population declines. Dickson (2002) considers that, since CITES has begun to consider listing more commercially valuable species, "delegations have become more senior, more concerned with commercial criteria and less patient with purely conservationist approaches". He adds that "if CITES were to take on the regulation of the trade in endangered commercial timber and fish species it would bring about a significant change in its character, in the direction of greater acceptance of the concept of sustainable resource management. But it is not clear that the Parties to CITES are ready for this."

Table 5

## Examples of CITES-listed species

Appendix I	Appendix II
All pachyderms (rhinos, elephants) with the exception of African Elephant <i>Loxodonta africana</i> populations listed in Appendix II	African Elephant populations of Botswana, Namibia, South Africa, Zimbabwe; White Rhinoceros <i>Ceratotherium simum</i> population of South Africa
Some felid (cat) species, e.g. Tiger <i>Panthera tigris</i> , Leopard <i>Panthera pardus</i> , Snow Leopard <i>Uncia uncia</i> , Jaguar <i>Panthera onca</i>	All felid (cat) species not listed in Appendix I
All 'great apes', e.g. Chimpanzee <i>Pan troglodytes</i> Gorilla <i>Gorilla gorilla</i> , Orangutan <i>Pongo pygmaeus</i> ; Golden Lion Tamarin <i>Leontopithecus rosalia</i>	All primate species not listed in Appendix I, e.g. macaques <i>Macaca</i> spp.
Some bear species, e.g. Asiatic Black Bear <i>Ursus thibetanus</i> , Sun Bear <i>Helarctos malayanus</i> , Himalayan populations of Brown Bear <i>Ursus arctos</i> , Panda <i>Ailuropoda melanoleuca</i>	All bear species not listed in Appendix I
All 'great whales', several smaller whales, dolphins and porpoises	Smaller whale and dolphin species not listed in Appendix I
The 'blue macaws', e.g. Hyacinth Macaw <i>Anodorhynchus hyacinthinus</i> , some other macaws, e.g. Bullion's Macaw <i>Ara ambiguus</i> , cockatoos e.g. Goffin's Cockatoo <i>Cacatua goffini</i> , several other parrots	All parrots not listed in Appendix I (with the exception of Cockatiels <i>Melopsittacus undulatus</i> , Budgerigars <i>Nymphicus hollandicus</i> and Rose-ringed Parakeets <i>Psittacula krameri</i> )
Philippine Eagle <i>Pithecophaga jefferyi</i> , Peregrine Falcon <i>Falco peregrinus</i>	All raptors (hawks, eagles, owls), cranes, and hummingbirds Trochilidae spp. not included in Appendix I
Some crocodylians, e.g. African Dwarf Crocodile <i>Osteolaemus tetraspis</i>	All crocodylians not listed in Appendix I
All marine turtles Cheloniidae spp., some freshwater turtles e.g. Batagur <i>Batagur baska</i> and some land tortoises e.g. Egyptian Tortoise <i>Testudo kleinmanni</i>	Some freshwater turtles and tortoises, land tortoises e.g. all Testudinae spp.
Some monitor lizards, e.g. Komodo Dragon <i>Varanus komodoensis</i>	Most chameleons, monitor lizards <i>Varanus</i> spp. not listed in Appendix I
Some boas e.g. Puerto Rican Boa <i>Epicrates inornatus</i>	All pythons Pythonidae spp. and boas Boidae spp. not listed in Appendix I
Alajuela Toad <i>Bufo perigrinus</i>	Poison arrow frogs <i>Dendrobates</i> spp.
Asian Bonytongues <i>Scleropages formosus</i> , Baltic Sturgeon <i>Acipenser sturio</i>	All sturgeon species not included in Appendix I, Arapaima <i>Arapaima gigas</i>
Three <i>Papilio</i> (swallowtail butterfly) species, Queen Alexandra's Birdwing <i>Ornithoptera alexandrae</i>	Birdwing butterflies not included in Appendix I, e.g. <i>Ornithoptera</i> spp., Tarantulas <i>Brachypelma</i> spp., scorpions in the genus <i>Pandinus</i>
Several Unionoid (freshwater) mussel species, e.g. Birdwing Pearly Mussel <i>Conradilla caelata</i>	All giant clams Tridacnidae spp., Queen Conch <i>Strombus gigas</i> ; All hard corals Scleractinia spp.
Alerce <i>Fitzroya cupressoides</i>	American Mahogany <i>Swietenia mahogany</i>
Asian Lady Slipper Orchids <i>Paphiopedilum</i> spp., several cactus genera, e.g. <i>Strombocactus</i> spp., <i>Turbincarpus</i> spp.	All orchid, cactus, cycad and aloe species not listed in Appendix I (with the exception of <i>A. barbadensis</i> ( <i>A. vera</i> ) and some cactus hybrids and cultivars); Snowdrops <i>Galanthus</i> spp., cyclamens <i>Cyclamen</i> spp., euphorbias
<i>Costus Saussurea costus</i>	American Ginseng <i>Panax quinquefolius</i> , Himalayan Yew <i>Taxus wallichiana</i>

### **Species in trade: parrots**

The family of birds collectively known as parrots (*Psittaciformes* spp.) includes more species threatened with extinction than any other. Two factors are considered key to the decline in wild populations of individual parrot species: habitat loss and collection for trade. Fifty-seven per cent of the over 90 parrot species threatened with extinction are impacted by trapping for the cage bird trade (BirdLife International 2000). For 39 of these species, trapping pressure is such that it may be a significant contributing factor to the risk of extinction.

All parrot species not already covered by CITES were listed in CITES Appendix II in 1981, with the exception of Budgerigars *Nymphicus hollandicus*, Cockatiels *Melopsittacus undulatus* and Rose-ringed Parakeets *Psittacula krameri*, which are common in the wild and bred in captivity for trade in very large numbers. As with orchids, not all of these species were considered at risk from trade, however trade controls for the entire family were considered necessary to ensure adequate trade controls for those species that were at risk. Nearly 50 parrot species are currently listed in CITES Appendix I.

### **CITES decision-making processes**

Parties to CITES meet approximately every two years to consider amendments to the CITES appendices and discuss implementation of the Convention. Areas of concern are often addressed through adoption of 'resolutions', which highlight key issues and make recommendations directed to the Parties, CITES Committees, non-governmental organisations and others. These resolutions are 'soft law': unlike the text of the Convention, they are not binding on the Parties, but their implementation is strongly encouraged. The Parties may also agree 'decisions', which are time-limited, action-oriented items rather than statements of principle.

Several Committees have been established to assist with implementation of the Convention, with equal numbers of representatives from each geographic region. These include the Standing Committee, which serves as the main decision-making body between meetings of the Conference of the Parties (CoPs) and the Animals and Plants Committees, which investigate trade issues in more depth and which often put forward recommendations to the CoP for adoption as resolutions or decisions. Review processes linked to CITES implementation undertaken thus far include the CITES 'significant trade review process' (see below), periodic reviews of CITES-implementing legislation and Standing Committee consideration of specific issues of concern, e.g. enforcement problems. In cases where there is significant concern regarding CITES implementation, the Standing Committee can and has recommended that all Parties suspend imports from and/or exports to a given Party or Parties, in effect, calling on all Parties to impose 'stricter domestic measures' (see below).

### **CITES 'significant trade' process**

CITES requires Parties to maintain exports of Appendix II species within sustainable levels and to make 'non-detriment findings' prior to all Appendix II exports (CITES Article IV). Concern that some countries were allowing exports in excess of sustainable levels prompted development of what has come to be known as the 'significant trade review process' within the Animals Committee in the mid-1980s. The process was formalised in 1992 with the agreement of CITES Resolution Conf 8.9, which requires the Animals Committee to periodically review trade in Appendix II species and to provide recommendations to range States in cases where such reviews indicate that trade might be unsustainable. 'Primary recommendations' address immediate conservation concerns and must be implemented within 90 days. Secondary recommendations address the need for additional information to be made available in support of non-detriment findings and must be initiated within 12 months. In cases where a range State's response to these recommendations is considered insufficient by the CITES Secretariat, the CITES Standing

Committee may recommend that all other Parties suspend imports of the species in question from that range State. A companion process has been established to support field studies for specific taxa, e.g. African Grey Parrots *Psittacus erithacus*, in order to further assess the impact of trade and compile the information necessary to make non-detriment findings.

To date, 79 bird, 94 reptile, 8 amphibian, 10 fish, 7 mollusc and 12 arthropod taxa have been reviewed under this process. In many cases, exporting range States have responded by increasing trade controls, often including a reduction in overall trade volumes and establishment of export quotas. Very few 'significant trade' species have been transferred to Appendix I. This is generally viewed as an indication of the success of the significant trade process, which has helped bring international trade of species of concern within more sustainable levels while not banning that trade altogether.

The significant trade process for plants has put less emphasis on the review of trade in individual species and more on higher taxonomic groups, with a particular emphasis on medicinal plants. A major role has been played by European countries, especially the United Kingdom (Royal Botanic Gardens, Kew) and Germany (Bundesamt für Naturschutz). There has been greater engagement with range States in the process of undertaking reviews than has been the case with animals, including a greater emphasis on field studies. The recent revision of CITES Resolution Conf. 8.9 has seen agreement on aligning the process for plants more closely with that for animals.

#### *Review of CITES implementing legislation*

Owing to concern regarding the failure of some Parties to adopt legislation sufficient to implement the Convention effectively, in 1992 the Parties also agreed a process for the review of CITES-implementing legislation (CITES Resolution Conf. 8.4). Those Parties for which such legislation was deemed inadequate were strongly encouraged to modify it accordingly, with technical assistance from the Secretariat. CITES decisions agreed subsequently established a process whereby the Standing Committee could recommend a ban on trade in CITES-listed specimens with those Parties that did not establish sufficient legislation. The trade with several Parties has been suspended in this manner, including, in January 2001, trade with Fiji, Vietnam and Yemen. Each of these countries was identified as trading CITES specimens in significant quantities, their CITES-implementing legislation "believed generally not to meet the requirements for implementation of CITES" (CITES Secretariat 2002a). The suspensions for Fiji and Vietnam were subsequently lifted in response to evidence that improvements in CITES implementing legislation were underway in both countries (CITES Secretariat 2002b).

#### *Governance implications of CITES*

CITES and other conventions that restrict international trade in wildlife have governance implications for wildlife producing and consuming countries. Proposals to list species in the CITES appendices or to move species between appendices can be submitted by any Party, whether or not that Party is a range State for the species concerned. A process for range State consultation has been established by CITES Resolution Conf. 8.21, those Parties not undertaking such consultation being required to submit their proposals 330 days in advance of the CoP to allow the CITES Secretariat to do so. Proposals may be accepted via consensus or voted upon, requiring a two-thirds majority of Parties present and voting to be accepted in cases where a vote is called for.

While each Party has one vote, it would not be accurate to say that each Party has the same voice at CoPs, since the size of delegations and experience with the Convention processes can vary hugely. Developed countries generally can afford to send significantly larger delegations than developing countries and to commit ongoing resources to following and influencing the nuances of the Convention. Although the Secretariat seeks funds to support the participation of developing country delegates (e.g. see CITES Notification No. 2001/60), developing countries are still

under-represented: at CoP 11 (Nairobi, 2000), for example, there were 35 delegates from the United States compared to 2 from Burkina Faso, 4 from India and 11 from Zimbabwe. A large number of observers also attend the meetings, including representatives of conservation and animal welfare groups as well as trade and industry. Observers directly representing rural stakeholders tend to be few and far between, although this was not the case at CoP 10 (Harare, 1997), where a significant effort was made by African-based NGOs to ensure such representation.

Governance concerns, i.e. the right to decide how native wildlife may be used, including whether or not it may be exported, are particularly acute in the case of Appendix I listings. Jenkins (2000) draws attention to the difficulty and expense of transferring a species from Appendix I to Appendix II relative to getting it listed in Appendix I in the first place. This reflects the application of the 'precautionary principle', which is generally interpreted within the CITES context as meaning that trade restrictions should be increased if there is concern that a species is in danger of extinction from international trade and should not be reduced until such time as there is clear evidence that this will not have a negative conservation impact.

In cases where Appendix I listings are proposed by governments from developed, non-range States, but where there is opposition from developing country range States who are equally keen not to have species listed in Appendix I (e.g. Goffin's Cockatoo, *Cacatua goffini*), this application of the 'precautionary principle' can lead to high levels of frustration. This frustration is exacerbated by the fact that developed country governments in general have far more resources to invest in preparing CITES proposals than do developing country governments. However, it is developing countries that are most often home to CITES Appendix I species and most often interested in the transfer to Appendix II of high profile taxa such as African Elephant and large cats e.g. Jaguar *Panthera onca* (efforts to transfer several whale species to Appendix II providing an important exception).

The picture is far from the black and white one that is sometimes portrayed of developed countries listing as many species as possible in Appendix I and developing countries resisting, but being overpowered. Developed country governments can often provide support, e.g. with proposal development and/or co-sponsorship, to developing country governments interested in putting forward CITES proposals. For example, a proposal to include all nine species of Asian box turtles *Cuora* spp., prepared by the Government of Germany, received wide support from Asian countries and was adopted by consensus (TRAFFIC 2000). The relatively greater economic power of developed countries may make them less susceptible to political pressure from other countries, e.g. more powerful members of a regional economic block or donor countries. It is also important to bear in mind that there are often considerable differences of opinion among developing country range States themselves regarding whether a species should be included in the appendices or transferred from one appendix to another. This is demonstrated most clearly by the ongoing debate within Africa about whether all African Elephant populations should be in Appendix I, or if some should be in Appendix I and some in Appendix II, as is currently the case. This debate is also extremely pertinent for governments of range States for Asian Elephant *Elaphus maximus*, the conservation status of which is far more precarious than that of African Elephant.

#### *Stronger domestic measures*

Another contentious issue related to decision-making in the context of the trade in CITES-listed species is the application of 'stronger domestic measures' with regard to controls on international trade, as provided for under CITES Article XIV. Few have contested the right of Parties to impose stronger domestic measures in the form of a ban on exports of native species and most countries have had such bans in place for at least some native species prior to CITES having come into force in the 1970s. The right of Parties to unilaterally ban imports from other countries is less widely accepted, however.

Jenkins (2000) comments that there has been "a rapid growth of cases where the Scientific Authorities of importing Parties take it upon themselves to determine if the trade in an Appendix II species is detrimental. These determinations are often made without consulting the exporting country and often with incomplete or out of date information." The justification for stricter domestic measures is usually the perceived failure of exporting countries to make adequate 'non-detriment findings', i.e., to maintain export volumes within sustainable levels. In some cases these measures can be implemented and rescinded more quickly than can CITES decisions that might similarly restrict imports, e.g. under the significant trade process. Their proponents might therefore argue that they operate in support of CITES implementation, while their opponents argue that they undermine it.

#### **Stricter domestic measures in the European Union**

The European Union implements CITES via Council Regulation (EC) No. 338/97 and Commission Regulation (EC) No. 1808/2001. Under these regulations, import permits are required prior to the import of all CITES Appendix II species. This 'stronger domestic measure' allows EU Member States to check and make an initial decision on whether to accept a shipment before it is exported. This helps identify permit violations, trade from non-range States, etc. in advance of a shipment arriving at a port of entry. EU Member States can also suspend imports in cases where a determination has been made by the Scientific Review Group of the EU Member States that such imports might be detrimental to a species' wild population. Consultation with range States is required as a part of this process. It could be argued that the European Union has developed an independent and more frequent 'significant trade review process'. The Scientific Review Group, which considers information on trade levels, status and biology, includes representatives from each EU CITES Scientific Authority. The Group meets every two to three months, more frequently than the CITES Animals Committee and can rescind as well as implement import restrictions relatively quickly in response to new information. Nevertheless, there are concerns that these measures undermine wider CITES processes and related efforts by range States to determine management regimes.

The United States' ban on the import of Nile Crocodile *Crocodylus niloticus* products is frequently cited as an example of the use of CITES-related stronger domestic measures for purposes other than conservation. Nile Crocodile was included in Appendix I and commercial international trade banned in 1975, although exports continued under reservations taken out by some range States. CITES Parties agreed to allow exports of Nile Crocodile skins to resume in 1983 under 'ranching schemes' intended to promote sustainable use in range States. According to Hutton (2000), these schemes had support from conservation groups including the IUCN SSC Crocodile Specialist Group. However, the US Government did not lower import restrictions established under the US *Endangered Species Act* for 13 years following the relaxation of CITES export restrictions. It has been implied that the import controls may have reflected an attempt to protect the American Alligator *Alligator mississippiensis* industry, rather than to conserve wild Nile Crocodile populations (e.g. see comments in Jenkins and Broad 1994) and argued that such unilateral import restrictions could be subject to a challenge under WTO as they restrict imports of "like" products (Hutton 2000).

The US *Wild Bird Conservation Act* (1992) provides a broader example of import bans established with the objective of achieving conservation benefits (a second objective of the Act is ensuring that exotic birds in trade are not subject to inhumane treatment). The Act bans all imports of wild-caught CITES-listed bird species until such time as exporting range States can demonstrate that exports are managed in accordance with criteria established by the US Fish and Wildlife Service. The Act had the effect of closing what was once the single largest import market for wild-caught CITES-listed birds, including species known to be common in the wild. Although there are provisions for imports of wild-caught birds to resume once specific conditions have been met by exporting Parties, this has yet to take place.

Arguments regarding the role of, and rights to impose, stronger domestic measures are being heard with increased frequency in conjunction with increasing globalisation and trade liberalisation. By effectively over-riding what has been internationally agreed, stricter domestic measures can "nullify the purpose for which states come together to form conventions," according to Martin (2000). Hutton (2000) makes the point more strongly, believing that "there is no room for unilateralism in a multilateral environmental agreement that already requires participants to surrender some of their sovereignty". Stricter domestic measures may also be subject to challenges under the WTO, a point made in a study on improving CITES effectiveness: "While the adoption of stricter domestic measures is well recognised in international law, the application of this right has led to concerns over equity and raises questions over the compatibility of CITES with the GATT/WTO" (ERM 1996).

**Research Requirement: Analysis of CITES proposals**

*In order to explore the governance issues associated with the CITES decision-making process, a systematic evaluation of proposals submitted over time to determine who submitted the proposals, who supported them and who contested them is required. Concern has been raised about decision-making processes in other multilateral agreements – for example within the WTO – and it would be informative to conduct this evaluation as a part of a wider study on decision-making processes in international trade agreements.*

Conservation-motivated changes to regulations governing the international trade in wildlife often have impacts far beyond those related specifically to controlling trade across international borders. Increased trade controls are often intended to and are successful in reducing export volumes, i.e. access to foreign wildlife markets. This generally has an impact on those markets and on domestic markets, if they exist, as well as on traders and producers and, ultimately although not universally, on the wild populations of the species in trade. As explained below, however, examining these impacts is not straightforward.

International trade controls are put in place for a number of reasons, most commonly in response to fiscal measures or phytosanitary concerns. It is therefore necessary to try to isolate the impacts of conservation-motivated trade controls from impacts resulting from other tariff and non-tariff trade barriers. In addition, international trade controls are themselves only one component of a larger bundle of regulations governing access to resources as well as access to markets. While some of these regulations may have been externally motivated, e.g. in response to a CITES listing, others may be part of long-standing domestic measures.

Even assessing the ramifications of a change in the CITES status of a species is not as straightforward as it might seem. Inclusion of a species in CITES Appendix II, for example, may result in far greater regulatory changes than simply subjecting international trade to issuance and review of CITES export permits. Some range State governments may limit their response to issuing export permits, this requirement coming on top of, but not influencing, other measures already in place. Others may set in motion a complex process of increased access restrictions, e.g. harvest quotas, seasons or even bans, and inspection and regulation of domestic sale (e.g. via licences, permits) as well as controlling exports. Importing Parties may similarly impose trade restrictions beyond what is required by CITES.

In general, an increase in trade controls via CITES and/or other measures has the effect of making illegal what was once legal, either by banning activities outright, or only allowing them to be conducted if additional procedures are followed. In some cases the change may be minimal. Where exports are already tightly controlled, for example, and the specimens in trade already subject to inspections on import for Customs or phytosanitary purposes, the change may be no more than issuance of a further export document (CITES permit) by the government office administering pre-existing trade controls. In other cases, for example when a species is transferred to CITES Appendix I, virtually all international trade for commercial purposes becomes illegal (exceptions being made for certain specimens, e.g. plants that are artificially propagated).

The impacts of CITES-related and other wildlife harvest and trade controls are further determined by the associated **enforcement effort and effectiveness**. It goes without saying that the fact that trade and/or associated harvest controls have been put in place does not necessarily mean that they will be adhered to. In many cases, trappers will not even be aware of the existence of or changes to international trade controls, as illustrated in the case study in Part Two. Traders and exporters are much more likely to be aware of sale and export restrictions.

The level of additional effort required to comply with new restrictions (transaction costs) will have an impact on traders, influencing who is involved, as well as on trade volumes. Incentives and disincentives for compliance and

*To tease out the direct contribution of the CITES trade measures to changes in trade patterns and the conservation status of the species listed in the various appendices, a multivariate analysis would be necessary...The combination of needing to consider confounding factors that may effect the effectiveness of the trade measures, and the difficult issue of achieving a measure of effectiveness for each species, makes the task of providing an independent evaluation of the trade measures impossible at this time (IUCN 2000).*



non-compliance will be weighed against each other, including the likelihood of illegal harvest or trade being detected and the scale of penalties likely to be applied if they are. In the case of African Elephants *Loxodonta africana*, for example, Dublin, Milliken and Barnes (1995) found that poaching rates correlated negatively with enforcement effort in range States. The ongoing illegal trade in rhino horn, Tiger bone, rare parrots, orchids and other wildlife products provides further evidence of the fact that some people believe that the potential benefits of illegal harvest and trade outweigh the risks.

The effectiveness of export controls can also be influenced by the enforcement of national policies related to access. In Tanzania's East Usambara Mountains, for example, although regulations on the international trade in timber had been in existence for over 20 years, it was not until the establishment of a nature reserve and enforcement of a ban on timber harvests therein that exports from the region actually declined.

### Interactions between wildlife trade controls and markets

International trade controls do not act in isolation of market forces, and in some cases act in concert with them, further complicating efforts to identify the impacts of trade controls alone. CITES meetings and other regulatory processes provide a focus for debate on the trade in individual species and wider issues, e.g. animal welfare concerns such as those associated with the wild bird trade. Most issues groups (and governments) are seeking to influence public opinion and policy simultaneously. Bearing in mind that the two are linked, it becomes difficult if not impossible to separate the impacts of campaigning and news coverage from that strictly related to changes in regulatory measures.

There are numerous examples of a change in fashion in US and European consumer markets coinciding with a change in trade regulations, e.g. with regard to the trade in spotted cat skins and African Elephant ivory. In some cases a change in consumer preference in response to campaigning may have a greater impact than changes in trade controls.

In the case of exports of seal skins to European markets, for example, declining demand appears to have had a much larger impact on trade volumes than did the 1983 EU ban on imports of the skins of Harp Seal *Phoca groenlandica* and Hooded Seal *Cystophora cristata* pups. According to Dixon (1984), although the primary aim of the anti-sealing campaigns was to end the killing of the pups of Harp Seals and Hooded Seals, "the publicity and emotiveness stemming from these campaigns have created an atmosphere in which the public largely rejects seal skins of all species". Dixon noted that there were also other factors that influenced the downturn in the international trade in seal skins, including a general shift in the market toward more long-haired and/or lighter weight pelts, and that, as a result, seal furs for clothing had been 'out' for several years and were likely to remain so for several more.

The opposite appears to have been true with regard to the United States, where all seal skin and other marine mammal product imports were banned in conjunction with agreement of the *Marine Mammal Protection Act* (1972). Although campaigning is likely to have led to a decline in demand for seal skin products in the United States, it seems likely that at least some trade would have continued.

CITES does not seem to have played a significant role with regard to the trade in seal skins. An effort to list Hooded Seals in CITES Appendix II in 1985 failed. The trade in fur seals *Arctocephalus* spp., some species of which were included in Appendix II in 1975 and the remainder in 1977, appears to have peaked in 1982, five to seven years after the CITES listings took effect. South Africa and Namibia had a policy to cull approximately 20 000-40 000 *A. pusillus pusillus* each year during the 1970s and 1980s, with stockpiled skins put on the market in the early 1980s (Brautigam and

"The 'save-the-seal' and 'save-the-whale' movements have employed two complementary strategies to sabotage markets: one is to influence national and international legislation, and the other is to destroy demand by creating an image of marine mammal products as being morally unacceptable" (High North Alliance 1997).

Thomsen 1993). The trade was subsequently reduced as a result of NGO campaigning; for example, the proposed culling of 30 500 animals for the export of skins and bacula (penis bones) to Taiwan in 1990 was suspended in response to protests by animal welfare organisations (*New York Times* 3.07.1990, cited in Brautigam and Thomsen 1993). The trade in *A. pusillus* has resumed, however, with CITES-reported trade averaging 37 000 per year from 1995-1999, with Namibia being the primary country of export.

The recent proposal to include the medicinal plant species Devil's Claw *Harpagophytum procumbens* in CITES Appendix II illustrates how, in some cases, simply voicing concerns that a species might be threatened by overexploitation within a CITES context can be enough to alter market dynamics, without any corresponding change in international trade controls having taken place (see box). In this case, the CITES listing proposal and attendant debate and publicity led to at least a temporary decrease in industry demand for wild Devil's Claw and an increased emphasis on production from cultivated sources. By contrast, the presence or threat of increased regulations can also lead to increased demand, through increasing a product's rarity value and/or prompting stockpiling of products. In 1990, bird breeders began 'buying up' Moluccan Cockatoos *Cacatua moluccensis* when the species was proposed for transfer to Appendix I, months before the CITES meeting where this proposal was discussed (Mulliken 1992). A similar situation occurred in 1995, with US imports of Egyptian Tortoise *Testudo kleinmanni* increasing significantly just before the species was transferred to Appendix I in 1995 (C. Hoover, TRAFFIC North America, *in litt.* to A. Barden, TRAFFIC International 2002). Illegal trade in pangolin *Manis* spp. scales appears to have increased prior to consideration of the transfer of *Manis* spp. to CITES Appendix I in 2000, judging from an increase in reported seizures during this period (S. Broad, TRAFFIC International *in litt.* to T. Mulliken, TRAFFIC International 2002).

#### **Devil's Claw: market shifts in response to proposed trade controls**

Devil's Claw *Harpagophytum procumbens* is a perennial vine that grows primarily in the deep sands of the Kalahari Desert in Namibia, Botswana and South Africa. It produces tubers containing a compound or compounds found to be useful in the treatment of rheumatism and arthritis. The international trade in Devil's Claw has increased significantly in recent years, especially to Germany. Concerns have been expressed about the conservation status of the species owing to evidence of over-collection and localised declines in some areas. However, no comprehensive survey has been undertaken to determine the overall status of the species throughout its range.

In Namibia, the majority of Devil's Claw collectors are San ("bushmen") people and other landless, often displaced, groups – amongst the poorest and most marginalised in southern Africa – who have traditionally used the tubers for medicinal purposes. Around 10 000 people currently earn a cash income from harvesting Devil's Claw. Although the earnings only range from US\$ 10-50 per year, the income is particularly significant, since it is earned in remote areas with few other income earning opportunities.

Concerns regarding the conservation status of Devil's Claw prompted the Government of Germany to propose that it and a similar species, *Harpagophytum zeyheri*, be listed in CITES Appendix II. The proposal was contested by southern African range states and some southern African NGOs, and later withdrawn. However, the mere fact that the listing was proposed (and the perceived association of CITES with rhinos, Tigers and other highly endangered species) is being credited with a dip in market demand and a renewed push towards domestication and cultivation, especially in South Africa. There is concern that South Africa's modern agricultural industry could produce Devil's Claw in quantities and at prices that would make wild-harvesting commercially non-viable, and could potentially have disastrous effects on the livelihoods of the landless poor who are dependent on harvesting. This would appear to be in direct conflict with the principles articulated within the Convention on Biological Diversity.

Source: Cole and du Plessis 2001.

Trade patterns can also be affected by other efforts linked to those aimed at changing regulations and consumer preferences. During the early 1990s, for example, opponents of the international bird trade waged a successful campaign to convince airline companies to stop transporting wild-caught birds. This had a major impact on trade from countries served by those airlines agreeing to the ban, such as Tanzania, from which large numbers of birds had been transported by KLM, one of the companies agreeing to suspend transport. This had an immediate and significant effect on trade patterns. Further research would be required to determine the extent that the overall trade declined in the longer term and/or was shifted to alternative trade routes as a result of this campaign.

Factors entirely unrelated to conservation, welfare or trade control concerns also impact on trade volumes, further complicating the effort to identify the impacts of changes in trade controls. These include market responses to changing fashion trends and economic conditions in countries of export or import. An increase in the trade in spotted cat furs to North America in the early 1960s, for example, has been attributed to increased demand for coats following the appearance of US First Lady Jacqueline Kennedy wearing a Leopard *Panthera pardus* coat (Nilsson *et al.* 1980, cited in Nowell and Jackson 1996). The US television show 'Baretta', which featured a Sulphur-crested Cockatoo *Cacatua sulphurea*, is credited with a rapid expansion in the US market for pet birds (Kahler and Wolrab 1998), and the cartoon 'Teenage Mutant Ninja Turtles' is reported to have prompted increased demand for pet turtles in the United Kingdom soon after its debut (Williams 1999).

Examples of the effects of changing economies are provided by recent economic downturns in East Asia and Venezuela. Wildlife exports from Southeast Asia were expected to decline in response to economic downturns across Asia in the late 1990s, a reflection of reduced purchasing power in the key markets of East Asia. It appears, however, that the opposite has been the case. The impacts of these downturns were most strongly felt in Southeast Asia, stimulating increased harvests of forest resources for export to what continued to be the relatively more prosperous markets in East Asia and the West (Donovan 1999). Rodriguez (2000) identified a similar increase in wildlife harvest rates in Venezuela following the onset of that country's economic crisis in 1983.

Bearing in mind these and other factors influencing wildlife trade patterns, it is nevertheless possible to identify strong correlations between increased international trade controls, e.g. those established under CITES, and changes in production, harvest and trade patterns. In some cases these changes are a clear result of changes in trade controls, while in others it appears that they are more coincidental.

Whatever their cause, changes in wildlife trade patterns have consequent impacts on the livelihoods of collectors and traders, as well as on the status of the target species. Impacts on trade volumes are discussed separately from impacts on conservation and livelihoods. These impacts are often highly interrelated: changes in financial returns from the wildlife trade affect not only household economies but may also determine future conservation incentives. Equally, declines in the conservation status of species in trade reduce the potential for securing benefits linked to trade or other uses, both consumptive and non-consumptive, of that species, including ecosystem functions.

## **Impacts on trade patterns**

### ***Quantities of 'target' species in trade***

CITES and related trade measures have resulted in a reduction in the international trade of many CITES-listed species, as is illustrated by comparison of CITES trade data on parrot exports for 1989/1990 and 1999 (Table 6). Exports of wild birds from four of the top five bird exporting countries in the late 1980s declined by over two-thirds from the late 1980s to the late 1990s. These declines were a result of a combination of CITES-related trade measures, a refusal

by some air carriers to transport live birds and 'stricter domestic measures', both on exports and imports. These included the responses of exporting countries to recommendations resulting from the CITES significant trade review process, Standing Committee recommended import bans in cases where such recommendations were not adhered to by the exporting Parties, and a complete cessation of imports of wild CITES-listed birds into the United States, which had previously been the largest importer of parrots, in the early 1990s. The decline in exports from Tanzania is most notable, with reported exports dropping from approximately 38 000 birds in 1989 to just 10 birds in 1999, and export quotas from over 116 000 birds to just 52. Only exports from Guyana remained relatively stable.

The CITES-reported trade in cat skins from wild sources similarly shows an overall decline subsequent to the listing of most 'big cats' in CITES Appendix I in 1975 (with the exception of Lion *Panthera leo* and Puma *Puma concolor*), and all remaining wild cat species in Appendix II in 1977. CITES trade controls corresponded to national export bans in many cases, e.g. with respect to spotted cat exports from many South American countries, and corresponding import bans, e.g. in the European Union. Reported international trade dropped from approximately 450 000 skins in 1980 (Nowell and Jackson 1996) to roughly 45 000 in 1999. The decline in trade has been credited to NGO campaigns discouraging the wearing of furs, as well as to CITES trade monitoring, which helped to reveal large quantities of skins being laundered into trade via intermediary countries (Nowell and Jackson 1996; IUCN 2000). Trade in 1999 was dominated by exports of roughly 37 000 Leopard Cat *Prionailurus bengalensis* from China. The only other species traded as skins in commercial quantities during the late 1990s were Eurasian Lynx *Lynx lynx* and Bobcat *Lynx rufus*, the recorded trade that remains having shifted entirely from the southern to the northern hemisphere.

"Rarely can the effectiveness of CITES be isolated from other factors which affect levels of international trade. For example, the decrease in the purchases of cat skins in the 1970s and the decrease in ivory purchases in the late 1980s and early 1990s were associated with large public awareness campaigns which helped to reduce demand for these products" (IUCN 2000).

In contrast to the trade in parrot and cat species, the trade in the skins of wild specimens of several CITES-listed reptile species, while declining somewhat, still numbers in the hundreds of thousands since the imposition of CITES trade controls. Average annual exports of Water Monitor *Varanus salvator*, for example, dropped from 1.4 million from 1983-1989 (Jenkins and Broad 1994) to 787 000 from 1995-1999. Average annual exports of Nile Monitor *V. niloticus* were just over 500 000 from 1983-1989, declining to 333 000 from 1985-1999. CITES data show that an annual average of approximately 570 000 tegu *Tupinambus* spp. skins were traded from 1995-1999, reported trade fluctuating among individual species in this 'taxonomically confused' genus. As is evidenced by the trade in fox *Dusicyon* spp. skins from Argentina and trade figures for peccary (e.g. Collared Peccary *Pecari tajacu*) skins, the international trade in some mammal skins also remains strong. Trade in some CITES-listed species has increased in recent years, e.g. of live specimens of CITES-listed reptile species such as poison arrow frogs in the genus *Dendrobates*.

In the case of some Appendix I species, it has been argued that trade restrictions have had little impact on trade volumes, with the exception that the trade has moved from being legal to illegal (du Plessis 2000). According to 't Sas-Rolfes (2000) with regard to rhinos, "the Appendix I listings led to a sharp increase in the black market price of rhino horn which simply fuelled further poaching and encouraged speculative stockpiling of horn". IUCN (2000) has similarly speculated that the Appendix I listing "raised the stakes" and may have stimulated poaching in range countries, and therefore presumably international trade to consumer markets. This study concluded further that trade restrictions would be expected to work best where demand is highly elastic. If demand is inelastic (as appears to be the case with rhino horn) "a ban will have little effect on the incentives for illegal trade and may even perversely encourage illegal trade in some cases" (IUCN 2000).

Table 6

Changes in Appendix II parrot exports\* from the five main producer countries 1989/1990 and 1999

	1989/1990		1999	
	Quotas	Exports	Quotas	Exports
<b>Argentina</b>	<b>1990 export quotas</b>	<b>1990 exports</b>		
<i>Cyanoliseus patagonus</i>	no limit	0	7 000	7 498
<i>Myiopsitta monachus</i>	no limit	0	20 000	3 370
<i>Amazona aestiva</i>	23 000	22 744	1 660	1 516
<i>Aratinga acuticaudata</i>	15 000	12 740	7 500	3 096
<i>Nandayus nenday</i>	15 000	11 810	6 000	2 947
Other species	20 500	15 265	3 500	1 957
<b>Total all species</b>	<b>&gt;73 500</b>	<b>62 559</b>	<b>45 660</b>	<b>20 384</b>
<b>Guyana</b>	<b>1989 export quotas</b>	<b>1989 exports</b>		
<i>Amazona amazonica</i>	15 000	7 588	9 000	8 828
<i>Aratinga perinax</i>	3 000	0	500	15
<i>Amazona furinosa</i>	2 300	1 016	1 000	1 159
<i>Amazona ochrocephala</i>	2 000	1 070	1 000	1 055
<i>Ara ararauna</i>	2 000	1 806	720	792
Other species	8 380	3 845	3 700	4 050
<b>Total all species</b>	<b>32 680</b>	<b>15 325</b>	<b>15 920</b>	<b>15 899</b>
<b>Indonesia</b>	<b>1989 capture quotas</b>	<b>1989 exports</b>	<b>export quotas</b>	
<i>Cacatua goffini</i>	8 400	7 241	-	0
<i>Cacatua sulphurea</i>	7 625	6 480	-	48
<i>Eus bornea</i>	5 750	7 327	225	368
<i>Lorius garrulus</i>	5 125	3 738	225	264
<i>Trichoglossus haematodus haematodus</i>	5 000	5 439	-	**325
Other species	42 250	42 546	3 455	4 666
<b>Total all species</b>	<b>74 150</b>	<b>72 771</b>	<b>3 905</b>	<b>5 671</b>
<b>Senegal</b>	<b>1990 export quotas</b>	<b>1990 exports</b>	<b>export quotas</b>	
<i>Poicephalus senegalus</i>	26 000	38 524	16 000	15 431
<i>Psittacus erithacus</i>	8 000	17 405	-	1
Other species	0	0	0	0
<b>Total all species</b>	<b>34 000</b>	<b>55 929</b>	<b>16 000</b>	<b>15 432</b>
<b>Tanzania</b>	<b>1990 capture quotas</b>	<b>1990 exports</b>	<b>export quotas</b>	
<i>Agapornis fischeri</i>	100 000	33 634	-	0
<i>Agapornis pullaria</i>	6 250			0
<i>Poicephalus cryptoxanthus</i>	2 500	126	0	0
<i>Poicephalus gulielmi</i>	2 500	1 575	40	0
<i>Poicephalus meyeri</i>	2 500	1 412	0	0
Other species	0	0	0	10
<b>Total all species</b>	<b>116 250</b>	<b>37 822</b>	<b>52</b>	<b>10</b>

Source: Thomsen, Edwards and Molliken 1992; CITES annual report data compiled by UNEP-WCMC; CITES Notifications.

\*Top five species for which quotas were set in 1989/1999.

\*\*All *Trichoglossus haematodus* subspecies.

are no species whose numbers have increased so dramatically after being placed on the CITES appendices that the improvement is obvious." In contrast, a study on the use of trade measures within CITES (OECD 1997) concludes that "it is more plausible to presume that, at the overall level, the status of species conservation is better off than it would have been if CITES had not existed at all". Like the ERM study, a review of trade measures in CITES undertaken by IUCN - the World Conservation Union on behalf of the UN Environmental Programme (IUCN 2000) concludes that CITES and associated measures have been successful for some groups, e.g. spotted cats, and appears to have been unsuccessful for others, e.g. rhinos. In the latter case, the authors note that the question remains whether the decline in rhino numbers would have been faster or slower without the Convention.

There are similarly conflicting opinions as to whether the financial value that commercial trade gives to wildlife is, or can be, beneficial to species conservation. Some argue that wildlife can be conserved by capturing its economic value and reinvesting in resource conservation (the "wildlife pays so wildlife stays" argument), while others contend that commercial use will ultimately lead to overexploitation, and both hold up numerous examples to back up their points. The argument is not black and white and there is no straightforward answer. In some cases, a reduction in CITES trade controls has coincided with an increase in wild populations and/or a decrease in illegal or unsustainable harvests. Two of the most commonly cited examples are Nile Crocodile and Vicuña *Vicugna vicugna*, both of which were listed in CITES Appendix I when CITES came into force and have been transferred to CITES Appendix II under ranching and/or quota schemes. It is important to bear in mind, however, that available information indicates that imposition of trade controls similarly coincided with population increases, and, specifically in the case of Vicuña, were necessary at the time to prevent further declines in the species' wild population. Arguments to allow increased trade in order to support conservation of other Appendix I species have been made successfully for several large cats, e.g. Cheetah *Acinonyx jubatus* and Leopard (see box) but unsuccessfully for Jaguar *Panthera onca*.

#### **Shifts in markets, trade rules and conservation incentives for African Leopards**

While trade bans (both domestic and CITES), in conjunction with publicity campaigns and fashion changes, did much to halt the decline in populations of some cat species caused by the fur trade, Jenkins (2000) contends that the CITES Appendix I listing of Leopard *Panthera pardus*, which came into effect along with the listing for all other large spotted cats in 1975, had a negative impact on populations in Africa. Leopards are relatively common in some parts of sub-Saharan Africa and often prey on livestock. The Appendix I listing is credited by Jenkins as having removed the financial value of (and hence conservation incentive for) Leopards to local farmers. He argues that their view of this species as a pest increased as a result and, subsequently, Leopards were often shot or poisoned and numbers began to decline in some areas.

Noting that the status of Leopards in Africa has been the subject of controversy for several decades, Nowell and Jackson (1996) draw attention to the fact that the fur trade was a major threat to this species in some areas in the 1960s and 1970s. The market for Leopard skins was influenced by a wider decline in trade in spotted cat furs in the early to mid-1970s as a result of public awareness campaigns, by the CITES listing, and by the listing of Leopard as 'Endangered' under the US Endangered Species Act (ESA). The original ESA listing, which prohibited imports of skins and trophies, was revised to 'Threatened' in 1982, subsequently allowing trophy imports. This was followed in 1983 with the agreeing of trophy export quotas by CITES Parties, which, according to Jenkins, reinstated the economic value of the Leopard and provided a conservation incentive.

Like Jenkins, Martin and De Meulenaer (1988, cited in Nowell and Jackson 1996) contend that a carefully controlled re-opening of the fur trade would significantly benefit Leopard conservation, as it would allow local people to benefit economically from the species far more than they do from trophy hunting and tourism, as currently practised in most range States. Options to enable local people to earn an income from Leopards could encourage them to cease eradicating them in their vicinity.

Whitaker (2000), drawing attention to the relatively large crocodilian populations in Botswana, South Africa, Zimbabwe, Papua New Guinea and the United States, where conservation programmes are linked to sustainable use, also believes that a controlled trade in crocodilian products in India would lead to the increase in that country's crocodilian populations.

### **Livelihood impacts**

Although concerns regarding the potential negative livelihood impacts of increased trade controls are increasingly voiced during debates over whether to expand protection measures, e.g. under CITES, there do not appear to have been many studies to gauge the actual impacts once such measures have been implemented. Exceptions to this general rule include work to document the effects on rural communities in Zimbabwe of the transfer of African Elephant to CITES Appendix I, and on Arctic communities of increased trade restrictions for marine mammals. A study of the ban on the international trade in Goffin's Cockatoo *Cacatua goffini* (see below) is a rare example where the socio-economic as well as conservation implications of preventing international trade in a certain species have been examined.

*The Irula Co-operative not only provides a local source of income, but also supports conservation of venomous snakes. Irulas collect venom from four poisonous snake species: Cobra Naja naja, Krait Bungarus caeruleus, Russell's Viper Vipera russelli and the Saw-scaled Viper Echis carinata. Many local people are scared of snakes in this region and often kill them on sight. The Irula's activities have helped farmers distinguish between venomous and non-venomous species. The latter pose no threat, but rather help reduce rodent damage to crops. As a result, far fewer snakes are now killed. (Whitaker and Andrews 1996).*

Despite the lack of analysis, it is clearly possible to infer that increased controls on international trade will have at least short term negative economic impacts on rural collectors, and, to a greater extent, wildlife traders and exporters. These may range from marginally increased transaction costs (see box) to a total loss of access to hunting/collecting rights and foreign markets. As noted in Chapter One, most of the individuals involved in the wildlife trade are not solely dependent on the trade for their livelihoods. Impacts on traders are likely to be more significant than on collectors since traders are likely to be more dependent on wildlife-derived incomes, whereas collectors are likely to include wildlife trade as one element of a diverse livelihood strategy. However, for the poorest groups, harvest of wildlife for sale on to export markets may be one of the few opportunities for earning a cash income which, even in small amounts, can make a critical difference to livelihood security.

Most impact-oriented research has focused on the conservation effectiveness of trade measures, as indicated by the studies cited above. Discussions of livelihood impacts tend to focus on the predicted loss of economic incentives for conservation as a result of trade restrictions or the likelihood of increased human-animal conflicts resulting from expanding human and wildlife populations. These two concerns are frequently linked, as is evidenced by various examples cited in this report. In some cases a contrasting view is presented, that unless trade is more strictly regulated, livelihoods will be negatively affected by the loss of opportunities to use wildlife for 'non-consumptive' uses such as tourism. However, with tourism dependent to a significant extent on effective management of protected areas, and government wildlife conservation budgets in some cases dependent on revenues from the sale of wildlife products, a counter-argument can also be made that restricting trade will have a negative impact. Still another view is put forward, that unless increased trade measures are imposed, the wildlife populations on which trade related income-generation is based will decline to the point where they are no longer capable of contributing to local livelihoods.

Unfortunately, there appears to have been very little quantitative analysis to test the validity of these different arguments across more than a fairly localised scale - the present study failed to identify more comprehensive reviews. What did emerge, however, was sufficient information to produce a series of 'case studies' demonstrating the varying responses to and impacts of different types of trade measures. These are presented below, grouped according to the nature of the international trade barrier in place.

### Transaction costs of trade controls

Increases in trade controls are often accompanied by increases in bureaucracy and associated transaction costs, and specifically costs related to acquiring permits and licences that may be required for harvesting, selling and/or exporting wildlife. An example is provided in the case of the ranching of the valuable birdwing butterflies by the Hatam people in the Arfak Mountains Nature Reserve in Irian Jaya, Indonesia, where acquiring a CITES export permit takes three to six months (BCN 1997). The delays in securing export permits make it difficult to respond to external orders (Wells et al. 1999). Poachers are not subject to similar transaction costs, and are able to sell butterflies at prices that undercut those of the Hatam. The penalties for illegal trade are often no more than confiscation of the butterflies, and bribery in cases of detection by government officials is said to occur (BCN undated).

Communities engaged in captive breeding of Iguanas *Iguana iguana* in Nicaragua have to obtain a sales permit every year before they are allowed to sell Iguanas to a middleman. In order to get the sales permit, their breeding programme must first have approval from the Department of Environment and Natural Resources. Obtaining the sales permit involves transport costs and sometimes also accommodation costs. Exporters are required to show proof that breeding sites have been inspected and to secure approval for transport from the Department of Environment and Natural Resources prior to being issued CITES export permits (Imbach and Gutierrez 1999).

In commenting on government regulations related to the control of the handling and transport of forest products, Warner (1995) argues that such regulations generally do not benefit collectors nor assist in conservation of the resource. Further, she argues that increased export restrictions, e.g. a limit on exports to include only processed products, can have the effect of creating a black market with little benefits going back to producers, and an increase, rather than a ban on harvests in cases where the latter was the desired effect. In his analysis of trade restrictions affecting the international trade in NWFPs, Iqbal (1995) noted the existence of CITES but, unlike for several other types of trade controls, e.g. phytosanitary measures and state [national] policies, did not credit CITES as having a 'distorting' effect on international trade.

### Impacts of trade bans

A total ban on commercial international trade in wild species or wildlife products, whether as a result of national trade controls or CITES, can have rapid and significant impacts on the incomes of people dependent on access to external markets as a part of their livelihood strategies. As is shown in the first example, for Goffin's Cockatoo *Cucatus goffini* below, such trade bans can have negative impacts from both the conservation and livelihoods perspective. The example that follows, regarding the trade in Fischer's Lovebird *Agapornis fischeri*, demonstrates that trade bans do not operate in isolation of market factors, and can simultaneously have a positive conservation impact and a negative livelihood impact. By contrast, the trade in products from venomous snakes in India demonstrates how trappers can diversify their livelihood strategies to respond to national and international trade bans. The impacts of a national ban on the trade in frog legs in India and subsequently Bangladesh show how a ban can simultaneously have positive and negative impacts on rural livelihoods. This section ends with a discussion of the ban on international trade in African Elephant *Loxodonta africana* products in response to the transfer of this species to CITES Appendix I, which underscores the fact that there may be insufficient information and/or widespread disagreement about the impact of such a measure.

#### Goffin's Cockatoo – A Lose-Lose Scenario for Conservation and for Livelihoods

Goffin's Cockatoo, also known as Tanimbar Corella – is endemic to the Indonesian Tanimbar islands where it is considered an agricultural pest, damaging nearly two per cent of the islands' maize crop every year (Cahyadi, Jepson and Manoppo 1994). Goffin's Cockatoo has been listed in CITES Appendix II since 1981. The Government of Indonesia established capture quotas for this and other parrot species in the 1980s, the quota for Goffin's Cockatoo



peaking at 8400 birds in 1989. The International Council for Bird Preservation (ICBP, now BirdLife International) included Goffin's Cockatoo in their 1988 *World Check-List of Threatened Birds* (Collar *et al.* 1988) owing to concern over trade volumes given the restricted range of this species. In January 1992, the conservation status of the species was assessed as 'Critical', i.e., a 50 per cent probability of extinction in five years, during a 'Parrot Conservation Assessment and Management Workshop' of ICBP and the IUCN/SSC Captive Breeding Specialist Group (IUCN and ICBP 1992). The US Government submitted a proposal to transfer Goffin's Cockatoo to CITES Appendix I at CITES CoP 8 (Kyoto 1992); this proposal would have been written before the assessment of the species as 'Critical'. The proposal was accepted by the Parties despite a report from the Indonesian delegation that the birds were still abundant (Jepson, Brickle and Chayadin 2001). This resulted in a ban on international trade effective June 1992.

Prior to the international trade ban, export of Goffin's Cockatoos had been controlled by a Chinese family, who recruited two people in each of the villages along the only road on the island of Yamdena to trap birds during the maize harvest in March and April. In 1992 trappers received between US\$3.75-6.50 per bird with an average catch of 30-50 birds a day - or US\$112-325 for a two-person team. This was a substantial sum of money considering that the average household income was approximately US\$250 per annum (Jepson, Brickle and Chayadin 2001). For those farmers whose maize crops were destroyed or damaged by the birds, the revenue from the trade provided valuable compensation as well as a significant source of additional cash income (MacKinnon 1998). Although this income accrued to a relatively small number of people, according to Jepson, Brickle and Chayadin (2001), because these individuals were distributed among the villages, it was likely that the benefits were spread more widely through onward spending and support to dependents.

Since the ban on international trade, this source of cash income has largely been lost. Some Goffin's Cockatoos are sold in the domestic trade in Java but they are not popular species locally. Jepson, Brickle and Chayadin (2001) report that local people remain angry about the trade ban. Farmers now keep the cockatoos away from their crops either by burning tyres - a practice which represents a serious risk of causing wildfires (Snyder *et al.* 2000) or by continuing to trap them. Since the cockatoos can no longer be exported to foreign markets, and since there is only a small domestic market, they are simply killed (MacKinnon 1998). In addition, Jepson, Brickle and Chayadin (2001) report that the mistrust by Tanimbar islanders of conservation NGOs as a result of the trade ban has compromised BirdLife's plans to establish a protected area on Yamdena, which could have contributed to the conservation of these birds and other endemic species.

No data exist to assess what the effect of the trade ban has been on the wild population of Goffin's Cockatoo. However, a survey conducted in 1993 found that the species was widespread and occurred at relatively high densities on Yamdena, the largest island of the Tanimbar group. Despite information that the species was not threatened, a proposal by the Government of Indonesia to transfer the species back to Appendix II in 1994 was withdrawn in the face of "vehement NGO opposition" (Jepson, Brickle and Chayadin 2001). Subsequent assessments (1996 and 2000) of its status according to the IUCN Red List were "lower risk - near threatened" (Baillie and Groombridge 1996; Hilton-Taylor 2000).

Available information indicates that the trade in Goffin's Cockatoos did not present a threat to the species at the time the CITES Appendix I proposal was put forward, and further, that if there had been a conservation concern, banning trade was not necessarily the best way to address it. The fact that trapping and extermination of the birds by local farmers is taking place in the wake of the export ban demonstrates that other factors besides market demand are driving removal of specimens from the wild.

*Changing beneficiaries as a result of CITES, captive breeding and trade shifts for Fischer's Lovebird*

Bird trapping provides a secondary source of income in Tanzania, with trappers' primary activity being farming. Research conducted by Edwards and Broad (1992) estimated that between 4150 and 8300 people might be involved in the bird trade overall in Tanzania. Given the average family size of 10 individuals, this indicates that 40 000 to 80 000 people could have been receiving some economic benefit from the trade in the early 1990s.

Wild specimens of the small but colourful Fischer's Lovebird, found only in Tanzania, were traded internationally in greater numbers than any other parrot species during the 1980s. Reported exports of Fischer's Lovebirds from Tanzania rose dramatically during the 1980s, averaging over 53 000 birds per year from 1983-1990, and peaking at over 87 000 birds in 1987. Reported exports from 1983-1990 totalled approximately 428 000 birds (Edwards and Broad 1992). Taking into account pre-export mortality, estimated at 16-28 per cent, Moyer (1995) estimated a total harvest of 644 500-711 000 birds from 1982-1992.

Trappers of Fischer's Lovebirds secured both financial and non-financial benefits from the export trade. Trapping was conducted exclusively by men during the dry season, involving an estimated 240-300 trappers and 720-1500 assistants (Moyer 1995). The average price per bird paid to trappers during 1990 was TZS156 (US\$0.60), with speculation that an average trapping team (trappers plus assistants) trapped 192-240 birds, for a total gross income of TZS29 940-25 074 (US\$115-144) per year. This income was directly beneficial to trappers and their families, increasing their access to basic commodities such as sugar and salt. Although Moyer observed that trappers did not appear to be any better off than others in their communities who pursued different income generating activities, he noted that they did have elevated social status owing to their employment by and contact with outsiders from the city.

Concern regarding the impacts of the trade on the species' wild populations prompted Fischer's Lovebird to be included in the first CITES 'significant trade review' (Inskipp *et al.* 1988), which concluded that the trade might present a 'possible problem', i.e. that trade might be resulting in the decline of the species' wild populations, but available information was insufficient to make such a judgement. The species was reviewed under the process again in 1992, at which time available information indicated that it was suffering major population declines. The CITES Animals Committee therefore recommended to the CITES Management Authority of Tanzania that 1) an export moratorium on the species be put in place until such time as a population survey had been carried out; and 2) to undertake such a survey. This survey determined that the species remained widespread, the range actually having increased somewhat, but that population densities in harvestable areas were extremely low, the overall population having suffered a 'drastic reduction' (Moyer 1995). The author of the survey recommended a continued moratorium on exports until at least 2001 to allow the species to recover. This recommendation has been followed, with exports continuing to be banned, and only two birds recorded in trade from Tanzania since 1995.

Inskipp and Corrigan (1992) noted that Fischer's Lovebirds breed prolifically in captivity. It seems unlikely that they could have predicted the growth in the international trade in captive-bred birds coinciding with the ban on exports from Tanzania, however. Net exports from non-range States, which are likely to have involved captive-bred specimens, increased from approximately 11 000 in 1991 to 95 000 in 1999, exceeding the peak exports recorded during a single year from Tanzania. China appears in CITES trade data as the main country of export in 1999 (nearly 74 000 birds), followed by South Africa (approximately 12 000 birds). Tanzania, once the only country in which Fischer's Lovebirds occurred and from which they could be supplied to foreign markets, lost all revenues resulting from the international trade of this species in a matter of years. An increase in captive production for this and several other lovebird species had already begun prior to the first significant trade review was undertaken. However, few were likely to have foreseen that one day foreign captive breeders would be supplying the entire market for this species.

Declining populations within and the export ban from Tanzania seem likely to be only one of several factors influencing the shift to captive production. US import restrictions on wild-caught parrots were also likely to have provided an incentive to breeders of this species. Increased demand for captive-bred birds by the public in Europe and North America in response to animal welfare concerns and recognition that hand-raised birds tend to make better pets than wild ones are also likely to have provided incentives for increased captive production. Even if Tanzania had continued to export wild-caught Fischer's Lovebirds in commercial quantities (even assuming that this could have been sustained, which seems unlikely given population trends), it seems probable that trade would gradually have become dominated by captive-bred ones. In 1999 alone, over 100 000 Peach-faced Lovebirds *Agapornis roseicollis* were reported in international trade, almost all of which would have been captive-bred. Although there will continue to be a collectors' and breeders' market for some of the rarer lovebird species, the mass market for lovebirds will almost certainly continue to be supplied by captive breeding.

As noted above, wild populations of this species had already declined dramatically by the time exports were banned, and therefore these benefits would similarly have been expected to decline regardless of trade controls. Despite the shift to captive breeding, it seems likely that more effective management of the trade earlier on in order to keep it within sustainable levels would have led to a different conservation and livelihood outcome.

#### *Trade bans in India prompt a change in livelihood strategies*

In India, a ban on exports of snake skins under the 1972 *Wildlife Protection Act* had a major negative impact on the Irula tribal group – one of the poorest social groups in India, and traditionally dependent on incomes from snake and rat catching. In response to the ban, and at the instigation of herpetologist Romulus Whitaker, the Iruulas formed a co-operative, the Irula Snake Catcher's Co-operative Society, in 1978 with a view to extracting snake venom from live-caught snakes.

The co-operative has now been operating successfully for over 20 years and is not dependent on outside financial support. In 2000, co-operative members were paid INR 150 (US\$3.35) for each snake brought to the co-operative, and also received a share of the co-operative's profits (Renuka 2000). Furthermore, unlike other forms of employment available in the region such as harvesting, which are often seasonal, snake hunting can be conducted year round.

However, the number of members in this co-operative remains relatively small, having started with 25 individuals and having grown to about 130. This is only a tiny fraction of the 20 000 Iruulas in Tamil Nadu and the 2000-4000 who were regular snake catchers before the banning of the snake skin industry.

The co-operative is the main supplier of snake venom to laboratories in India but orders from outside the country have to be refused because of a ban on export (Thorold 2001). In overseas markets venom is used not just for anti-venom serum but also for other medical purposes. Russell's Viper *Vipera russelli* venom, for example, is a coagulant and can be used to control bleeding (Anon. 2002). The ability to export to foreign markets would enable the co-operative to increase employment for tribal people. The co-operative has therefore applied to the government to be allowed to export venom.

#### *Coconservation and livelihood impacts of frog legs ban in India and Bangladesh*

An FAO study of the trade in frog legs (Teixeira *et al.* 2001) highlights the fact that wildlife trade controls can simultaneously have both positive and negative impacts on rural livelihoods. The international trade in frog legs involves over 30 countries and had an estimated value of US\$48.7 million dollars in 1998. Nearly 95 per cent of the international trade at that time was supplied by wild stocks.

of sources that the trade has promoted a significant increase in illegal killing of elephants at the continental level or in terms of national populations affected". This report sparked a great deal of controversy with numerous interventions from Parties and NGOs disagreeing with this conclusion. One outcome was increased recognition of the need for better information on poaching rates and illegal trade (TRAFFIC 2000). There is little doubt that the debates regarding the best way to secure the future of African Elephants and whether or how elephant products should be traded internationally will continue for years to come.

### ***Managing trade for sustainability***

As illustrated above, for example in the case of African Elephants, there is an increasing tendency within CITES processes to create measures to allow trade in species to resume where there is clear evidence that it will not be detrimental to wild populations, and, more specifically, is likely to be beneficial. The CITES listing criteria and various resolutions have provided for the transfer of specific populations of Appendix I species to Appendix II under strict conditions. The success of these programmes with regard to the conservation and sustainable use of several crocodilian species is often highlighted. The information provided below with regard to the management and trade of Vicuña provides an 'out of Africa' example of the direct links that can be made between community wildlife management programmes and CITES, and the challenges presented in deriving significant livelihood benefits from such programmes during the start up phase, especially if there are trade barriers in key consumer markets. The example of Royal Python *Python regius* illustrates how range States can retain the benefits of captive production and provides a contrast to the case of Fischer's Lovebird above. Unlike the trade in many CITES-listed animal species, which often draws criticism in the West owing to animal welfare concerns, the trade in plant species receives relatively little attention. Examples from the trade in wild plants illustrate how CITES processes have helped bring attention not only to the conservation concerns associated with the wild plant trade, but also to the importance of this trade to rural communities.

### ***Managed trade in Vicuña offers rewards for conservation and livelihoods***

Research into community management of Vicuña *Vicuña vicuña* conducted under WED's Evaluating Eden project demonstrates that controlled trade can generate a win-win situation for both conservation and for livelihoods.

Vicuña are wild camelids that inhabit high regions of the Andes of Argentina, Bolivia, Chile and Peru that are prized for their fine wool. Although the Incas are known to have developed techniques for harvesting the fibre from live Vicuña, until recently the most common practice was to kill the animal in order to get its fleec (Lichtenstein *et al.* 1999). Hunting of this species resulted in a population decline from perhaps two million animals at the time of the Spanish conquest to some 12 000 in the 1960s (IUCN 2000).

In 1967, the four Andean countries above (and later Ecuador) adopted a regional agreement prohibiting all trade in Vicuña and products derived from them (GFCFS 2001). This was followed by the listing of Vicuña in CITES Appendix I, effective 1975, which similarly prohibited international trade.

The populations subsequently recovered to the point where, in 1987, two populations (one in Chile and one in Peru) were transferred to Appendix II to allow trade in cloth made from Vicuña wool sheared from live animals. In 1994, this was extended to include trade in wool from live animals and in stockpiles of wool in Peru. In addition, the whole Peruvian Vicuña population was transferred to Appendix II. In 1997, several Argentinean populations and a Bolivian population were also transferred to Appendix II, in the latter case with a zero quota for export of wool sheared from live animals. The export restriction on Bolivia was removed in 2000 and a quota for 2102 kg of wool established in 2001. Changes in international trade controls have been accompanied by changes at the national level. Communities in Peru were given progressively more control over Vicuña in the 1990s, starting with use rights and stewardship in

1991 and expanding to property rights in 1995. Sale of the animals on the open market remained prohibited, however (Lichtenstein *et al.* 1999).

In Peru, government figures show an increase in Vicuña populations from 67 121 animals in 1994 to 103 161 in 1997. This indicates that the re-opening of trade in Vicuña products combined with the transfer of property rights to local communities have been positive for conservation. Communities have been encouraged to take responsibility for protecting Vicuña from illegal hunting, and many now employ guards for this purpose. Poaching is believed to have declined considerably since 1994, from an average of 9000 Vicuña per year to less than 600. Government reports on community Vicuña projects also suggest that community attitudes towards the animal have changed. However, there have also been other factors contributing to the improvement in populations, such as the virtual cessation of the terrorist activity of Sendero Luminoso, which severely hampered protection efforts in the 1980s and early 1990s (Lichtenstein *et al.* 1999).

The Peruvian Puna is inhabited by indigenous communities that in most cases are living below the poverty line. Household economics are based on subsistence agriculture and livestock herding. Given this context, income generated from the sustainable management of Vicuña has significant potential to boost the local economy. In 1998, the price of raw Vicuña fibre in Peru was US\$257/kg, about five times the price of cashmere, its closest substitute. Each Vicuña can yield about 200-220 grams of fibre every two to three years, implying a potential revenue of US\$17-28 per animal per year. How much of this potential revenue reaches community members depends on a number of factors: the type of management approach; the extent of outside input; the capacity of the community in relation to capture and shearing; and the systems established within the community for spending communal revenues. The Lucanas and San Cristobal communities in Peru, in whose territories there are large numbers of Vicuña (11 000 and 7000 respectively in 1997), have good prospects for generating benefits in the medium term. In the short term, however, there has been little financial benefit to these two communities because they have had to use the funds generated to pay off the bank loans used to start their Vicuña projects. This situation was exacerbated by delays in the sale of the fibre (no sales were made between 1995 and 1998), which meant that no income was received by the communities for two years. Nevertheless, both projects have provided employment, albeit to a limited number of people. The San Cristobal project pays an annual total of about US\$50 000 to community members employed in the Vicuña operation, most of which is spent locally and thus has a multiplier effect on local businesses. This is the equivalent of the total annual income of 100 families locally. This includes employment for 20 women who carry out the initial de-hairing of the Vicuña fibre.

The economic viability for communities with small numbers of Vicuña is more questionable, primarily as a result of the captive management approach that Peru's government camelid agency has been promoting. Captive management requires a significant initial investment in materials for enclosures with the result that communities have to take on a large amount of debt. Management in the wild, provided communities can receive technical assistance and training in capture methods, is a low cost alternative which can generate economic benefits as well as provide an incentive for conservation of wild populations.

Vicuña populations in Peru provide a special case where some of the conditions were present for producers to capture a significant share of the rents from sale of wildlife products: Vicuña is only found in a few Andean countries, Vicuña wool has unique characteristics, and there are as yet no farmed populations of Vicuña to compete with wool from wild stocks. Peru was the first of the producer countries to have any sizeable production of fibre to sell on international markets, its populations being the first to be transferred from CITES Appendix I to CITES Appendix II. Moreover, the Peruvian Government decided to pool the sale of all Vicuña fibre produced. By law all fibre produced must be sold through the National Vicuña Society (NVS), which is a federation of community producer groups. The approach taken has been to sell the entire national production in one block through an auction. The idea is to boost the bargaining power of the producers by preventing them from competing against each other and also to capture a

premium by selling the product as exclusive (Lichtenstein *et al.* 1999). The aim was to prevent communities from being exploited by intermediaries, but this was not without its costs as institutions had to be set up for this purpose. The communities are required to pay a percentage of the sales revenue to cover the costs of the NVS. This has led to questions from the communities about the benefit of the services received from the NVS, in particular from Lucanas, the community with the largest number of Vicuña. The inability of the NVS to maintain the relatively favourable marketing deal secured from the first auction in subsequent years has led to considerable dissatisfaction on the part of the community producers even though an open bidding process was involved (Lichtenstein *et al.* 1999).

Another factor affecting benefit flows to communities has been international market conditions. The price of raw Vicuña fibre declined by 14% between 1994 and 1998. The reduction in price and the long delays in selling the fibre have caused considerable dissatisfaction on the part of producer communities. A lack of access to US markets is cited as an important factor depressing the demand for Vicuña fibre. Despite the transfer of some populations to CITES Appendix II, Vicuña are still listed as 'Endangered' under the US *Endangered Species Act*, with the result that imports are banned. As with Nile Crocodile, their status under the Act will need to be changed to 'Threatened' if imports are to be allowed. Further factors affecting demand and therefore depressing prices include the economic crisis in Japan and a general problem of over-supply in the fine fibres market (Lichtenstein *et al.* 1999).

#### *Ranching of Royal Python captures benefits for Togo*

Royal Python *Python regius* has an extensive range in West and Central Africa, and is traded in large numbers as live specimens. It has been listed in CITES Appendix II since 1975, along with all other python species. Ranching is widely practised in Togo, gravid females being collected from the wild and housed until they lay their eggs. The eggs are incubated and the resulting juveniles sold. Unlike captive breeding, which entails limited collection to build and maintain captive stock, ranching involves the annual collection of animals, which means that collectors are paid on a regular basis, shifting some of the income from the trade from reptile farms to reptile hunters. Although ranching in this manner is potentially beneficial to wild python populations, pythons are mainly collected from agricultural areas, and so there is no incentive to protect wild habitat. In addition the harvesters are not land owners so they have limited ability to protect the snakes. Excess specimens are not returned to the wild in collecting areas, reducing the likelihood of sustainability there (Jenkins 1997).

Togo is amongst the world's poorest countries and the foreign exchange brought in by the reptile trade is important. At the local level, the economic effects of the trade should also not be underestimated. During the hunting season a snake collector can collect 200-300 gravid females, which can then be sold for up to US\$4.50 each – generating a total income of over US\$1300. In a country where the national minimum wage is US\$24 per month – or US\$288 per year – this is a substantial sum of money (Harris undated). Togo's export quota for 2001 was 1500 wild and 52 500 ranched specimens (CITES Notification No. 2001/041).

#### *CITES and the trade in wild plants - growing potential for win-wins*

Efforts are being made to work with rural collectors of the CITES Appendix II species American Ginseng *Panax quinquefolius* in order to improve the sustainability of collection of the wild roots, which are far more valuable than cultivated specimens, and therefore improve the long-term livelihood opportunities for collectors. In the case of Devil's Claw, CITES has provided an international forum for representatives of the San people to bring attention to issues of benefit sharing, and, it could be argued, prompted further investment in examining conservation and livelihoods concerns. This may improve the long-term opportunities for the San people to secure a better share of the revenues from a species that, like many other medicinal plants destined for Western markets, is likely to move into intensified and more standardised production.

CITES has drawn attention to concerns regarding the unsustainable trade in snowdrops *Galanthus* spp. and cyclamens *Cyclamen* spp., both of which are traded in large numbers from Turkey and Georgia: Turkey's export quotas for 2001 include 8 million *Galanthus* bulbs and over 2 million *Cyclamen* tubers, and Georgia's include 15 million 'ranching' *Galanthus woronowii* and 200 000 'ranching' *Cyclamen coum*. CITES significant trade projects have been undertaken for both genera in Turkey and Georgia. The Royal Botanic Gardens, Kew, the UK CITES Scientific Authority for plants, is supporting the mapping of *Galanthus* populations for 18 species in Turkey as a tool to assess the impact of bulb collection to "promote and maintain sustainable trade", with all data being repatriated to the Turkish CITES Scientific Authority (CITES Inf. PC.10.1). The bulb trade provides an important source of income to rural collectors, and an investment has been made by the UK-based NGO Fauna & Flora International (FFI), traders, governments and agencies to work with local communities to develop sustainable management programmes in Turkey (Groves 2001). The approach to sustainable production developed in Turkey is also now being implemented in Georgia (S. Oldfield, FFI, pers. comm. to T. Mulliken, TRAFFIC International 2002). The 'ranching' of this species, i.e. the replanting of bulbs harvested from the wild for later harvest and sale, as well as artificial propagation *in situ* have been promoted, approaches that will help keep the income generated from the sales of these two species within the range countries and communities where they are found.

**Research requirement: Exploring the benefits of captive production**

Earlier sections of this report have already identified the need for more livelihood impact analysis. However, an additional requirement is comparative analysis to evaluate the livelihood and conservation benefits of captive breeding and ranching. This would enable informed choices to be made concerning alternative production methods, including when countries are faced with impending controls on trade in wild-caught specimens.

*P. elliottii* and *Cyprinus lusitanica* whilst the main hardwood plantation tree species include *Tectona grandis*, *Milicia excelsa*, *Acacia nearnsii*, *Eucalyptus saligna*, *E. maidenii* and *E. grandis*.

The forestry sector provides around 730 000 jobs and contributes an estimated six per cent of total gross domestic product (GDP), although this is expected to be a gross underestimate due to the unvalued and undervalued provision of services such as water catchment for hydropower dams, water supplies, local climates, soil erosion control and numerous other employment opportunities. There are also many undervalued forest products, timber and non-timber, including wood energy, building poles and timber, herbal medicines, edible fruits, mushrooms, plant-derived oils, leaves and beverages, fodder, fibre, honey, candles, dyes, ornamental plants, household utensils and handicrafts (Iddi 1998).

The forestry sector accounts for around 10 per cent of foreign exchange earnings, derived from exports of timber, timber products, honey, beeswax, mushrooms and other non-wood forest products. The export trade in forest products is mostly hardwoods, with 6475 m<sup>3</sup> sawnwood (worth US\$2.14 million) and 2332 m<sup>3</sup> roundwood (US\$0.99 million) exported in 1998, according to statistics from the Forestry and Beekeeping Division. In recent years, a greater demand has been shown for *Swartzia madagascarensis* and *Tectona grandis*. The main markets are Japan, Singapore, Hong Kong, India and Taiwan. CITES-reported plant exports from Tanzania have included small quantities of aloes, orchids and succulents exported to Europe and the United States between 1991 and 1996 and over 10 tonnes of *Prunus africana* during 1998-99, mostly to France and the United States. Honey and beeswax exports average 4860 tonnes and 324 tonnes per year respectively, although the sector runs well below an estimated potential of about 138 000 tonnes of honey and 9200 tonnes of beeswax per year (Government of Tanzania 2001).

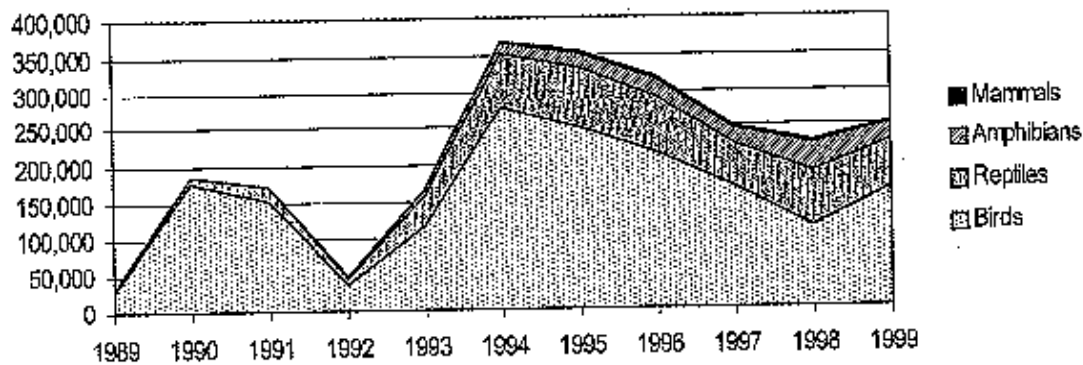
In the late 1980s, a study conducted by IUCN - the World Conservation Union and the International Trade Centre (1989) suggested that the gross value of wildlife (other than timber and fisheries) to the Tanzanian economy was US\$128.50 million per year. Illegal wildlife hunting for wild meat comprised some US\$50 million annually, followed by non-consumptive tourism, tourist hunting and other forms of consumptive utilisation. More recent research conducted in Tanzania suggests well over two-thirds of people eat wild meat, with up to 95 per cent of the rural population claiming it is their most important meat protein source (Barnett 2000).

Live specimens form the majority of animal exports from Tanzania by quantity, although there is also a substantial trade in trophies and skins. During the period 1989 to 1999 at least 1.68 million birds, 521 000 reptiles, 148 000 amphibians and 12 000 mammals were exported from Tanzania (Milledge in prep.). Bird exports peaked in 1994, whilst amphibian and reptile exports have not dropped significantly since 1995 (Figure 2). Many animal exports are CITES-listed species including, during the period 1990 to 2000, nearly 600 000 live birds, reptiles, mammals and invertebrates and over 16 000 trophies and skins, according to CITES trade data.

Another essential use of wildlife at the subsistence level is for traditional medicine. Traditional medicine, including witchcraft, plays an important role in Tanzania due to its higher acceptance than western medicine, lower costs and greater availability (Marshall 1998). Over 80 per cent of Tanzanians are dependent on traditional phytomedicine, which utilises over 1000 plant species.



**Figure 2**  
**Live animal exports from Tanzania, 1989-1999**



Source: Milledge (in prep.).

### Regulatory and institutional framework

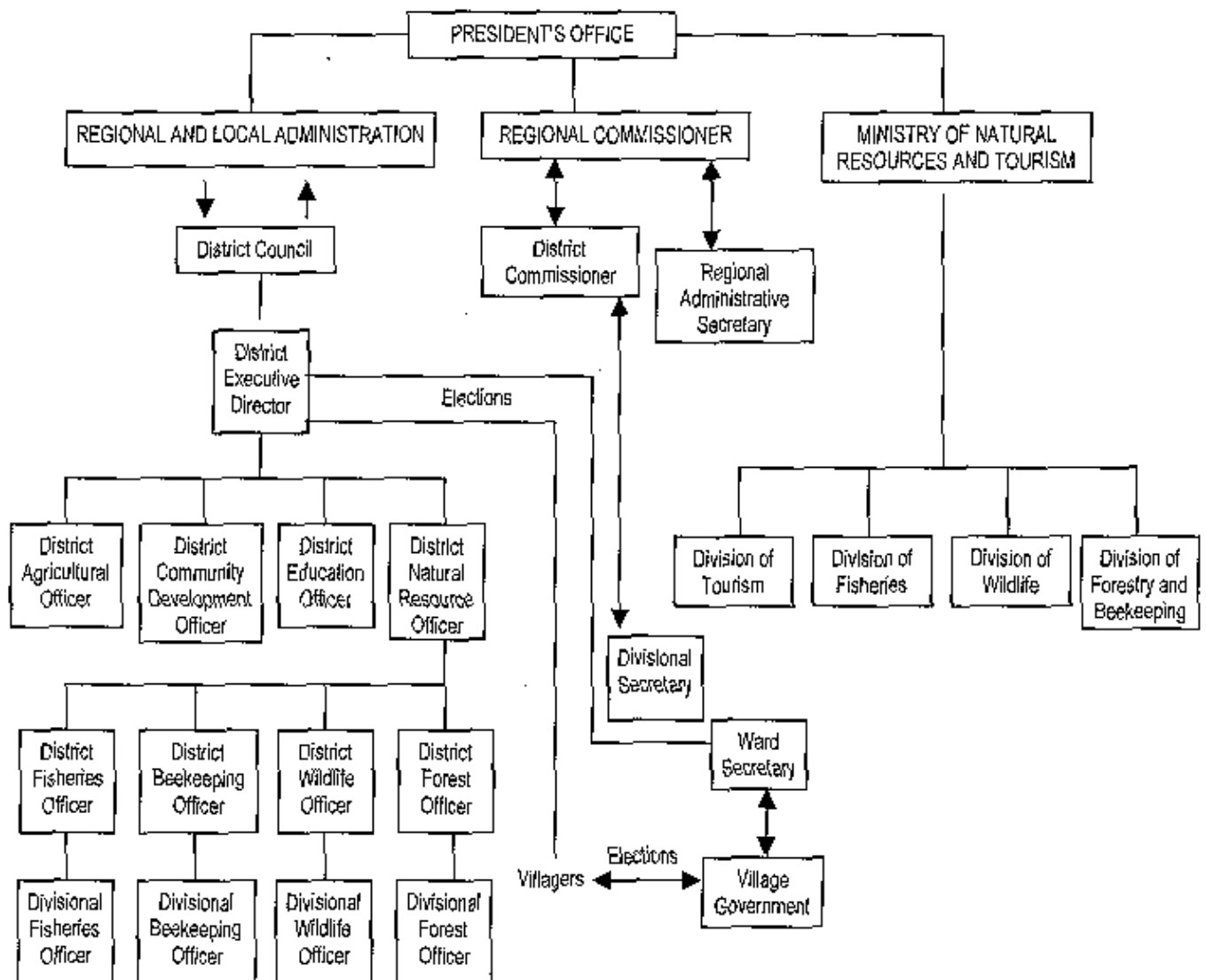
In recent years, Tanzania has initiated a thorough revision of national policies and strategies with the aim of realising poverty alleviation by 2025. The sustainable use of wildlife is seen as one contribution towards reducing levels of poverty in addition to providing funds for conservation management. This has been laid down in five recently revised policies (National Environmental Policy 1997; National Fisheries Sector Policy 1997; National Beekeeping Policy 1998; National Forest Policy 1998; and Wildlife Policy of Tanzania 1998).

The major legal instruments related to these policies include the *Forest Ordinance Cap. 389* (1982), *Plant Protection Ordinance Cap. 133, Supp. 60*, *Wildlife Conservation Act No. 12* (1974, amended 1978), *National Park Ordinance Cap. 412, Supp. 59* (1959, amended 1962, 1974 and 1975), *Ngorongoro Conservation Area Ordinance Cap. 413* (1959) as amended in the *Game Parks Laws* in 1975 (Miscellaneous Amendments), *Fisheries Act No. 6* (1970), *Marine Parks and Reserves Act No. 29* (1994), *Protected Places and Areas Act No. 38* (1969) and *Economic and Organized Crime Act* (1984). These legal instruments cover the creation and declaration of protected areas and species, permit and licence requirements, royalties and penalties. The *Wildlife, Fisheries and Forestry Law* is currently under revision.

The conservation and utilisation of wildlife in Tanzania is largely based on categorisation of areas and species according to their degree of protection. The protected area network now covers 38 per cent of the total land area and incorporates 12 national parks, the Ngorongoro Conservation Area, 28 game reserves, 38 game controlled areas and 540 forest reserves. In addition, seven marine reserves and one marine park have been established. The 540 forest reserves cover approximately 132 000 km<sup>2</sup> (15 per cent) of Tanzania's surface area, of which 3 per cent overlaps with wildlife protected areas. Human settlement is prohibited within forest reserves although utilisation of the natural resources varies depending on whether it is a protected forest reserve or productive forest reserve.

The Ministry of Natural Resources and Tourism is charged with the overall management and conservation of wildlife in Tanzania, producing and amending national legislation and management of various localised projects. The Ministry contains four divisions, namely Wildlife, Fisheries, Forestry and Beekeeping and Tourism (see Figure 3). The Ministry of Natural Resources and Tourism also supervises five parastatal wildlife organisations: Tanzania National Parks (TANAPA), Tanzania Wildlife Research Institute (TAWIRI), Ngorongoro Conservation Area Authority

**Figure 3**  
**Organisational structure of central and local Government of Tanzania**



(NCAA), College of African Wildlife Management (CAWM) and Tanzania Wildlife Corporation (TAWICO). The local government structure also includes wildlife, fisheries, forestry and beekeeping officers whose mandate covers the management of natural resources within every district or division.

Before the mid-1980s the Government (through the Forest Division) managed forests whilst the Tanzania Wood Industries Corporation (TWICO) controlled wood-based industries. However, the large area of forests on open land under public control and limited resources available for the designated forest reserves resulted in poor management. Liberalisation of the forest sector since the mid-1980s has included decentralisation and joint forest management with local communities. The Forestry and Beekeeping Division (FBD) provides overall policy guidance for the forestry sector. Management and protection of the forest reserves has been highly decentralised under district administration,

with the exception of major catchment forests, which remain under the management of the FBD. Around 100 000 km<sup>2</sup> of forests and woodland are central government reserves and 30 000 km<sup>2</sup> are local government reserves.

Licences and permits govern the harvest, transport, sale and export of timber and timber products. According to the *Forests (Amendment) Rules* (2001), fees payable on non-plantation forest produce vary according to the product and species. Log fees are TZS10 000-70 000/m<sup>3</sup> (US\$11-80/m<sup>3</sup>), depending on the timber class, with the highest fees for the more valuable species. Other fees include poles TZS200-250 (US\$0.20-0.30) each, withies at TZS1500 (US\$1.70) per 30, firewood at TZS3000 (US\$3.40) per m<sup>3</sup>, charcoal at TZS400 (US\$0.50) per 28kg bag, medicinal barks at TZS2000 (US\$2.30) per kg and medical plants at TZS500 (US\$0.60) per kg. These fees are payable for all products harvested from forest reserves. In open land, fees are only payable for 24 of the most threatened tree species.

Fees from plantations are lower, with log fees at TZS1500-12 000 (US\$1.70-13.70) per m<sup>3</sup> (except *Tectona grandis* and *Juniperus procera*, costing up to TZS50 000 (US\$57) per m<sup>3</sup>), firewood at TZS500-1000 (US\$0.60-1.10) per m<sup>3</sup> and poles at TZS200-300 (US\$0.20-0.30) per m<sup>3</sup>. Licence fees for sawmills are up to TZS200 000 (US\$228) per annum, whilst registration fees for forest produce dealers cost TZS20 000-200 000 (US\$23-228) per annum.

The Wildlife Division (WD) has responsibility over wildlife in game reserves, game controlled areas, forest reserves and outside protected areas. The WD is also responsible for the issuing and monitoring of permits, licenses and quotas for all aspects of wildlife utilisation, including live exports. In Tanzania, the WD is the CITES Management Authority whilst the Tanzania Wildlife Research Institute (TAWIRI) is the CITES Scientific Authority. Tanzania ratified CITES on 27<sup>th</sup> February 1980 and the *Wildlife Conservation Act* (1974) provides the legal authority for CITES implementation. CITES remains the primary means of regulating the live export trade of potentially threatened and endangered species from Tanzania. Currently, 306 species found in Tanzania are listed in the CITES appendices. Tanzania has ratified numerous other international environmental conventions including the Convention on Wetlands of International Importance, Convention on Biological Diversity, Convention Concerning the Protection of the World Cultural and Natural Heritage and the Convention of Migratory Species of Wild Animals (Bonn Convention).

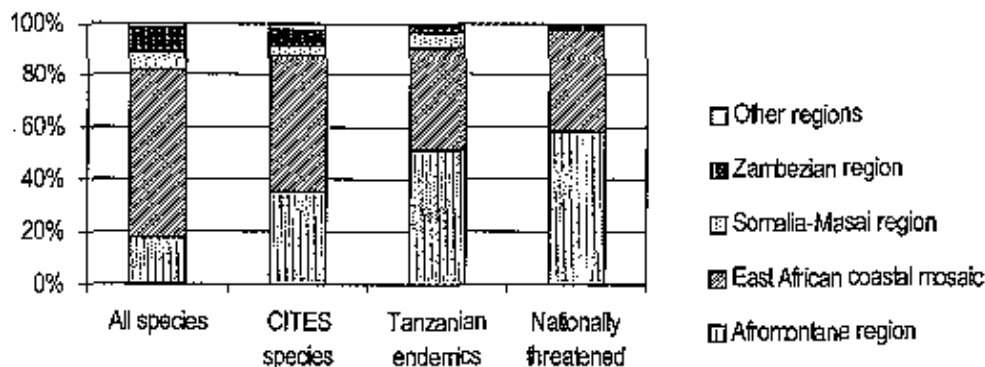
The major mechanism by which the live export trade is controlled is through a system of licences, permits and quotas. The issuance of Trophy Dealer Licences (TDL) and Trapper Cards determines the number and quality of trappers and traders, whilst permits and certificates are the legal instrument that must accompany all live animals from the trapping ground to export. Trapper Cards and TDLs for trading in live animals are valid for one year and cost TZS10 000 (US\$11.40). Four types of permit/certificate are used in Tanzania: Capture Permits, Ownership Certificates, CITES permits and Trophy Export Certificates. Their issuance is normally restricted to licence holders and the precise nature of the consignments follows strict annual national quotas. National quotas are usually divided equally amongst TDL holders. Every species has a capture cost which must be paid before capture and is normally less than US\$1 (although it can reach several hundred US dollars for some mammals). After capture, the specimen details are transferred to Ownership Certificates, which cost TZS500 (US\$0.60) each and are valid indefinitely. All CITES specimens must be exported using a CITES export permit, which costs TZS2500 (US\$2.90) and is valid for six months, whilst non-CITES specimens are exported on a Trophy Export Certificate, which costs TZS1500 (US\$1.70).

### **Wildlife use and trade in the East Usambara Mountains**

The East Usambara Mountains in northeast Tanzania are part of the Eastern Arc Mountains, a crescent-shaped chain of ancient, isolated mountains stretching from southeast Kenya to southwest Tanzania. The Eastern Arc Mountains and associated coastal forests are of global importance in terms of their high levels of species endemism and biodiversity. They are also nationally important in Tanzania for large-scale agriculture (particularly tea and coffee estates) water catchment functions, hydro-electricity and, in the past, for timber.

Figure 4

Relative collection pressure (expressed as percentages) of live reptiles from different bio-geographic regions in Tanzania



Source: Millidge (in prep.).

In 1998, a total of approximately 113 400 people lived in the 54 villages of the East Usambara Mountains (Kessy 1998). The majority of inhabitants belong to the Sarubaa tribe although considerable in-migration has occurred, mostly around tea estates. Other neighbouring tribes include the Bondei, Digo and Zigua. Population growth rates in the Usambara Mountains are reported to be higher than the local district, regional and national averages due to the resource richness and high agricultural potential of the highlands (Lulandala 1998). The nearest large city is Tanga, with a population of around 200 000, whose water supply is dependent on the East Usambara Mountains via the Sigi River.

The climate is monsoonal and the area receives up to 2000 mm of rain per year in two distinct seasons (March-May and October-December). Hamilton and Macfadyen (1989) give evidence of decreased annual rainfall reliability from about 1960 on a regional scale. Tea and sisal estates dominate commercial agriculture, while subsistence agriculture consists of mixed cropping systems (Kessy 1998). Using local farming techniques, farmers practice shifting cultivation using short fallow periods on farms around three hectares in size although most villagers also have permanent homestead plots. The main cash crops include coffee, cardamom, black pepper, cinnamon, groundnuts and cloves, whilst major food crops are cassava, maize, banana, beans, rice and yams.

Since the end of the 19th century, over 50 per cent of the forest of the East Usambara Mountains has been cleared for commercial crops (coffee, tea), commercial and individual logging, forestry plantations and agriculture (Schmidt 1989; Newmark 1998). Fragmentation has resulted in just eight major patches of forest remaining, of which 335 km<sup>2</sup> (74 per cent) occurs within forest reserves. The East Usambara Mountains are unique in containing montane forest occurring at lower altitudes than any other mountain block in Tanzania and a high proportion (54 per cent) of closed forest (Newmark 1998). In addition to natural forests, the East Usambara Mountains also contain around 27 km<sup>2</sup> of plantations, which are mostly exotic species, such as *Eucalyptus Eucalyptus* spp., Musizi *Maesopsis eminii* and Teak *Tectona grandis*. There is also limited on-farm cultivation of tree species providing food, medicines, construction and local tools, shade and water conservation (Johansson *et al.* 1997; Kessy 1998).

The long-term isolation of these remnant mountain forests and a humid coastal climate has resulted in a high level of species richness and endemism (Rodgers and Hornwood 1982; Lovett 1989; Kingdon 1990; Lovett and Wasser 1993). High levels of endemism are found especially amongst vascular plants (25 per cent), trees (18 per cent), molluscs (45 per cent), butterflies (40 per cent), millipedes (85 per cent), amphibians and reptiles. The East Usambara

Mountains possibly contain the highest concentration of endemic species of any other similar sized area in Africa and the Eastern Arc Mountains have become globally recognised as one of the 14 areas of highest biodiversity (WWF and IUCN 1994; Myers 1998; Myers *et al.* 2000).

Residents of the East Usambara Mountains are highly dependent on forest resources and the local Smbaa language is notably rich in botanical and ecological terms. Villagers also recognise the importance of forests for regulating hydrological processes and microclimate for agriculture. Research conducted in the East Usambara Mountains revealed a high variety of plant species providing important products (Fleuret 1988; Kessy 1998). These included fuel wood (33 species), poles (35 species), withies (32 species), ropes (11 species), foods (28 species), medicines (185 species) and household utensils (83 species). In total, the local population uses at least 350 tree species (<six per cent endemic) and cultivate around 100 tree species (including 20 endemic species) (Kessy 1998). Härkönen and Vainio-Mattila (1998) also document a wealth of useful food plants in the forests of the East Usambara Mountains used by the Smbaa in addition to food crops, including 46 species of wild vegetable (especially *Basella alba*, *Dioscoreophyllum volkensii*, *Launea cornuta*) and wild mushrooms (including *Termitomyces* and wood-inhabiting fungi *Armillaria* spp., *Auricularia* spp., *Pleurotus* spp. and *Polyporus* spp.). Kessy (1998) estimated forest vegetable consumption at around 12 kg per capita per annum. A survey conducted in two villages in Amani during 1999 revealed a total of 55 plant species recorded as remedies for 31 diseases (Desissa and Hamisy 1999). A list of 185 medicinal species was compiled through interviews with 14 traditional doctors, of which 63 (34 per cent) are forest plants.

Commercial activities based on wildlife resources in the East Usambara Mountains involve timber, wood products, live/dead animals, medicinal and ornamental plants. Although logging has been conducted in the East Usambara forests since German colonial times, large-scale logging did not start until the 1960s. The Eastern Arc Mountains are a significant source of live animals for the export trade. Figure 4 shows how the collection pressure of reptiles from the Eastern Arc Mountains (Afromontane region) is particularly high for CITES-listed species, endemic species and nationally threatened species.

### The case study

The findings presented in subsequent sections are derived from participatory research carried out in three villages in the East Usambara Mountains. Two of the three villages border the Amani Nature Reserve, a new category of protected area in Tanzania that affords a higher level of protection than for forest reserves. Amani Nature Reserve was officially gazetted in 1997 and covers 83.8 km<sup>2</sup>, including 10.7 km<sup>2</sup> of forest managed by tea estates and the Amani Botanical Garden, covering over 3 km<sup>2</sup>. The third village borders Mtai Forest Reserve, which covers an area of 3.1 km<sup>2</sup> of lowland and sub-montane forest but has been severely degraded by commercial logging, subsistence wood collection, land encroachment and clearance, hunting and mining.

The villages remain anonymous in this report since information was gathered on sensitive issues, including illegal trade, and the purpose of the research was to understand livelihood dynamics rather than precipitate enforcement action. The three villages are referred to simply as A, B and C.

### Wildlife trade as a livelihood strategy in the East Usambara Mountains

Agriculture and livestock (subsistence production and cash sales) are the main occupations in East Usambara villages in terms of time spent and overall numbers of people involved. They are also the most important income generating activities. However, no individuals or households specialise in just one activity and other important elements include formal employment – mainly on one of the large tea estates in the area – and self-employment in some form of small business. Of the business activities, operation of small shops, bars and restaurants were considered the most important, followed by trade in timber and medicinal plants. Other more minor income-generating activities involving natural resources include the sale of animals, firewood and tree seedlings.

Villagers report no striking correlation between periods of low agricultural activity and high wildlife trade activity; rather it is the timing of the dry and rainy seasons that influences all activities. Animals, timber and medicinal plants are collected throughout the year although there are changes in harvest times subject to species availability and logistical issues. For example, many invertebrates are collected during the rainy season after eggs have hatched, and timber-harvesting peaks in the dry seasons, when it is easier to cut and transport logs.

Forest resources are highly valued by the villagers, reflecting their proximity to reserved and unreserved forest land, isolation from urban influences and relatively high reliance on both forest products and services. The villagers also acknowledge the forest's influence over climate and the subsequent knock-on effects on agricultural seasons, ranking rain as the most important forest resource (Table 7). The subsistence nature of the local economy is exemplified by the close relationship between key livelihood components (food, shelter, health and so on). The only two important livelihood components identified by villagers not directly provided by forests are education and transport, however, earnings from forest-related occupations are used to pay for such services during prosperous times.

**Table 7**

**Use of major forest natural resources in the East Usambara Mountains, listed in order of decreasing importance**

RESOURCE OR PRODUCT <sup>1</sup>	MARKET DESCRIPTION	
	Subsistence	Commercial
Rain / water	Local	
Firewood	Local	
Poles	Local	
Timber	Local	Local, national and international
Medicinal plants	Local	Mainly local*
Wild plant foods	Local	
Bush meat	Local	
Honey	Local	Local, national and international
Wild fruits	Local	Local
Live (or dead) birds, reptiles, amphibians and invertebrates		International

**Notes:** \* There are rarely any sales beyond the village but occasionally people will come from cities in Tanzania (Tanga, Dar es Salaam or Dodoma) or Kenya (Nairobi) to be treated by a village healer or to buy a specific treatment / preparation.

### Relative significance of different livelihood strategies for different stakeholders

Different stakeholder groups (women, men, youth and elders) are involved to greater and lesser extents in wildlife-related trades (Table 8). Agriculture (preparing land, sowing, harvesting and selling) is the most important activity for women in terms of the relative numbers of people involved, the amount of time spent and the amount of income earned. Women do not directly participate in the trade in live and dead animals or in timber. Small numbers of women spend limited time collecting medicinal plants but this is less important than formal employment or operation of small businesses such as shops and bars. Similarly, agriculture is the most significant activity for men, followed by operation of small businesses, but men are also involved in the timber trade (pit sawing and acting as middlemen) and to a lesser degree, in collecting and selling animals and medicinal plants. Of the four groups, collection and trade in live and dead animals is most important to youth, although even for this group it is less important than employment on tea estates and involvement in agriculture and small businesses. Youth also earn income from pit sawing and to a lesser extent from collecting medicinal plants. Village elders are most reliant on agriculture but are more involved than other groups in practicing traditional medicine. Elders are also involved in the timber trade, almost exclusively as middlemen.

**Table 8**  
Relative importance of different wildlife trades to different social groups

Most important				Least important
Women	Medicinals			
Men	Timber	Medicinals	Animals	
Youth	Timber	Animals	Medicinals	
Elders	Timber	Medicinals		
Most important				Least important
Timber	Men	Youth	Elders	
Animals	Youth	Men		
Medicinals	Elders	Men / Women	Youth	

In terms of wealth differentials, richer people (identified by locally defined criteria including: amount of land and types of crops grown; number of livestock; type of house (wealthier people can afford iron sheets for roofs and bricks rather than poles and thatch); ownership of a small business; ability to send children to school) were more likely to be involved in cash crop agriculture, business operations and livestock. Poorer people were predominantly involved in subsistence agriculture – or producing less valuable and lower quality crops, working for the wealthier people (e.g. as porters or keeping problem animals away from crops) and working on the tea estates.

Involvement in wildlife trade is not restricted to richer or poorer groups, but tasks tend to be differentiated by wealth. In the case of the trade in animals, collectors tend to be the poorer people, while the richer ones act as middlemen. For the timber trade, the poorer people act as cutters and porters, while the richer people measure timber, pay labourers and again act as middlemen. The trade in plant medicines tends to be limited to relatively few people, some of whom are termed traditional practitioners whilst others are termed witchdoctors. They tend to be poorer members of the community although some experienced elders are wealthier. Unlike the trade in timber and live/dead animals, which covers collection/harvesting as well as transport and sale, the commercial aspect of trading in plant medicines only involves dispensing and practicing, not collection from the wild.

use restrictions. It is evident that some illegal timber and live/dead animal trade still occurs informally in the three villages although evidence suggests that this is little more than very small-scale levels.

### **Timber trade**

Key interventions affecting the local timber trade since 1985 have included restrictions on access, harvesting and sales, national export bans and changes in enforcement levels:

**1986** – Temporary logging suspension via Administrative Order by Director of Forestry and Beekeeping: The Forest Division temporarily suspended logging on the East Usambara Mountains in May 1986 due to concerns over environmental degradation as a result of SSM operations (Hamilton and Bested-Smith 1989). Two months later, SSM were granted permission to continue logging for a period of 18 months but logging in montane forests stopped after December 1986 and logging from lowland forest at Kwamsambia ceased in June 1987. These logging suspensions did not seriously affect rural communities in the East Usambara Mountains at this time since they were directed primarily at SSM.

**1987** – East Usambara Mountains timber harvest ban. This was implemented following a decline in key commercial timber species. Following the ban, large-scale harvesting decreased but smaller-scale harvesting and pit sawing continued, largely illegally. On the one hand, this was the start of greater benefits being accrued by local villagers, since they perceived themselves as minor benefactors during SSM operations. On the other hand, this led to an increase in informal trade dynamics in reserved and unreserved land, causing the trade to go underground. This was the start of longer-term impacts on society with respect to whole village sectors operating informally/illegally.

**1989** – Pit-sawing ban in Amani Division. This was imposed following concerns over sustainability although it was not mentioned by any of the villages. This is probably due to the subsequent *School Desk Concession* that permitted pit-sawing of trees that had been felled before the concession came into place in December 1990. In reality, the concession was not adhered to and widespread abuses and illegal activities occurred (Tye and Kimaro 1992). Most trees were felled live and most timber sold for profit rather than making desks. Timber trade was not reported to have been affected by the pit-sawing ban in Amani Division or the concession.

**1993** – National hardwood export ban. This was announced by Government Order in June 1993 after the 1992 Earth Summit and affected 33 companies. Tree felling in catchment areas, riverbanks and valleys was also banned. This effectively prevented large-scale, commercial logging from continuing in the East Usambara Mountains and therefore helped to ensure that access was basically restricted to the local villagers. However, the villagers did not mention the ban having had a major negative impact on livelihoods, probably because major sawn wood markets existed for construction and furniture inside Tanzania (especially Tanga and Dar es Salaam).

**1997** – Amani Nature Reserve (ANR) gazetted. The actual establishment does not seem to have had a great impact, since villagers were already harvesting at relatively low levels from within ANR. However, villagers have felt a larger impact since 1998, especially reduced financial returns from timber sales. This is largely due to the more active enforcement of the nature reserve with assistance of FINNIDA through the East Usambara Catchment Forest Project. Indeed, the fact that financial profits have reportedly dropped significantly since 1998 signifies that significant returns were previously being made from timber coming from within the reserve.

**1999** – Increased licence and permit fees. Villagers report that the high costs associated with permit and licence fees hinder many people from trading legally and may even cause continued illegal trade. The fact that this is seen as an important issue nowadays indicates that the enforcement of ANR access seems to have effectively discouraged most



timber traders from harvesting illegally. However, the options for legal trade are affected by the high costs of licence/permits and the short supply of commercially valuable timber from open land.

A total of 22 species of timber were recorded as the main species traded during the period 1985 to 2001 (Table 10). Out of these, a total of 17 timber species were listed in trade during 1985 and 21 in 2001. Whilst limited trade occurs within villages of the East Usambara Mountains, most of the timber is sold to markets in Tanga and Dar es Salaam via middlemen.

**Table 10**  
**Timber species traded in the East Usambara Mountains**

Scientific Name	Kiswahili	Scientific Name	Kiswahili
<i>Azelia quanzensis</i> Pod Mahogany	Mbaubakofi	<i>Maesopsis eminii</i> (exotic)	Mhesi
<i>Albizia gummifera</i> Peacock Flower	Mkuge	<i>Mangifera indica</i> Mango (exotic)	Mwembe
<i>Albizia lebeck</i> East Indian Walnut (exotic)	Mkingu	<i>Milicia excelsa</i> Mvule	Mvule
<i>Albizia schimperiana</i> Forest Long-podded Albizia	Mshai	<i>Newtonia buchananii</i> Forest newtonia	Mnyasa
<i>Allanblackia stuhlmannii</i>	Msambu	<i>Ocotea usambarensis</i> Camphor wood	Kamfu
<i>Beilschmiedia kweo</i>	Mfumbu	<i>Pterocarpus mildbraedii</i>	Mkula
<i>Bombax rhodognaphalon</i> Wild Kapok	Msufi mwitu	<i>Pterocarpus tinctorius</i>	Mniuga maji
<i>Cedrella odorata</i> Spanish Cedar (exotic)	Cederea	<i>Sciococarya birrea</i>	Mug'ongo
<i>Cephalosphaera usambarensis</i>	Mtamba	<i>Sterculia appendiculata</i> Tall sterculia	Mfume
<i>Grevillea robusta</i> Silky Oak (exotic)	Kabella	<i>Syzygium guineense</i> Water pear	Mzambarau
<i>Khaya anthotheca</i> African Red Mahogany	Mtondoro	<i>Treculia africana</i> Wild jackfruit	Mfenesi

In 1985, the species of timber traded in largest quantities included *Milicia excelsa*, East African Camphor-wood *Ocotea usambarensis*, Forest Newtonia *Newtonia buchananii*, African Red Mahogany *Khaya anthotheca*, *Beilschmiedia kweo* and Pod Mahogany *Azelia quanzensis*. At that time, timber species traded in the largest volumes were also the most expensive species. For example, *Milicia excelsa* and *Ocotea usambarensis* cost double that of Silky Oak *Grevillea robusta*, which was traded in very low volumes. These species preferences closely matched other records from the late 1980s. Ruffo (1989) reports that pit sawyers were extremely selective and cut four species almost exclusively: *Khaya anthotheca*, *Milicia excelsa*, *Newtonia buchananii* and *Ocotea usambarensis*. A list of plywood and timber species provided by SSM in the late 1980s also included *Khaya anthotheca*, *Newtonia buchananii* and *Beilschmiedia* (Ruffo 1989).

The more expensive species in 1985 remain the higher priced species today. Prices for *Milicia excelsa*, *Beilschmiedia kweo* and *Ocotea usambarensis* are currently around TZS4800-5400 (US\$5.50-6.20) per plank and double the price of the lowest value timber species. However, whilst the relative price of individual timber species has changed little, the relative volumes traded have shown a shift, with some lower value species now traded in large quantities. For example, two lower value species, *Grevillea robusta* and Wild Jackfruit *Treculia africana*, are currently traded in relatively large quantities, whilst higher value species such as *Milicia excelsa* and *Khaya anthotheca* are now traded in relatively low quantities. Other low value species previously traded in low volumes or not at all but now included in commercial trade include *Allanblackia stuhlmannii*, *Maesopsis eminii*, East Indian Walnut *Albizia lebeck*, Peacock Flower *Albizia gummifera*, Wild Kapok *Bombax rhodognaphalon*, Forest Long-podded Albizia *Albizia schimperiana*, *Sciococarya birrea*, Tall Sterculia *Sterculia appendiculata* and *Pterocarpus mildbraedii*. Even Mango wood *Mangifera indica* has entered trade in recent years.

**Table 11**  
**Ranking of timber species (from highest to lowest) by availability, price and volume sold (Village B)**

AVAILABILITY		PRICE			VOLUME		
1985	2001	1985	2001	1985	2001	2001	
<i>Milicia excelsa</i>	<i>Grevillea robusta</i>	<i>Milicia excelsa</i>	<i>Milicia excelsa</i>	<i>Milicia excelsa</i>	<i>Milicia excelsa</i>	<i>Grevillea robusta</i>	
<i>Cephalosphaera usambarensis</i>	<i>Azelia quanzenis</i>	<i>Ocotea usambarensis</i>	<i>Beilschmiedia kweo</i>	<i>Ocotea usambarensis</i>	<i>Ocotea usambarensis</i>	<i>Beilschmiedia kweo</i>	
<i>Azelia quanzenis</i>	<i>Cephalosphaera usambarensis</i>	<i>Khaya anthotheca</i>	<i>Ocotea usambarensis</i>	<i>Newtonia buchananii</i>	<i>Newtonia buchananii</i>	<i>Treculia africana</i>	
<i>Albanlackia stuhlmannii</i>	<i>Albanlackia stuhlmannii</i>	<i>Beilschmiedia kweo</i>	<i>Azelia quanzenis</i>	<i>Beilschmiedia kweo</i>	<i>Khaya anthotheca</i>	<i>Azelia quanzenis</i>	
<i>Newtonia buchananii</i>	<i>Maesopsis ematii</i>	<i>Newtonia buchananii</i>	<i>Khaya anthotheca</i>	<i>Newtonia buchananii</i>	<i>Newtonia buchananii</i>	<i>Ocotea usambarensis</i>	
<i>Ocotea usambarensis</i>	<i>Newtonia buchananii</i>	<i>Grevillea robusta</i>	<i>Treculia africana</i>	<i>Grevillea robusta</i>	<i>Azelia quanzenis</i>	<i>Newtonia buchananii</i>	
<i>Khaya anthotheca</i>	<i>Beilschmiedia kweo</i>	<i>Azelia quanzenis</i>	<i>Newtonia buchananii</i>	<i>Newtonia buchananii</i>	<i>Grevillea robusta</i>	<i>Maesopsis ematii</i>	
<i>Beilschmiedia kweo</i>	<i>Treculia africana</i>	<i>Cephalosphaera usambarensis</i>	<i>Grevillea robusta</i>	<i>Cephalosphaera usambarensis</i>	<i>Cephalosphaera usambarensis</i>	<i>Khaya anthotheca</i>	
<i>Maesopsis ematii</i>	<i>Khaya anthotheca</i>	<i>Albanlackia stuhlmannii</i>	<i>Maesopsis ematii</i>	<i>Albanlackia stuhlmannii</i>	<i>Albanlackia stuhlmannii</i>	<i>Milicia excelsa</i>	
<i>Treculia africana</i>	<i>Ocotea usambarensis</i>	<i>Maesopsis ematii</i>	<i>Albanlackia stuhlmannii</i>	<i>Maesopsis ematii</i>	<i>Maesopsis ematii</i>	<i>Albanlackia stuhlmannii</i>	
<i>Grevillea robusta</i>	<i>Milicia excelsa</i>	<i>Treculia africana</i>	<i>Cephalosphaera usambarensis</i>	<i>Treculia africana</i>	<i>Treculia africana</i>	<i>Cephalosphaera usambarensis</i>	

The five timber species currently traded in the largest quantities are *Grevillea robusta*, *Beilschmiedia kweo*, *Treulia africana*, *Azelia quanzensis* and *Ocotea usambarensis*. According to the villagers' perceptions, four species have shown marked declines in availability in the wild over the past 15 years: *Milicia excelsa*, *Ocotea usambarensis*, *Khaya anthotheca* and *Newtonia buchananii*. These are slow-growing species with favourable construction characteristics. It is noticeable that these were amongst the four most selected timber species during the mid-1980s, pointing to overexploitation as the major cause for their decline.

Overall, ranking exercises conducted in the three villages (shown for Village B in Table 11) according to price, volume traded and availability reveal six key findings:

1. Timber species that have declined most in availability were the most exploited species during the 1980s and 1990s;
2. In 1985, there was a close positive relationship between trade volumes and species value/price, although some lower value species are now traded in relatively high volumes;
3. Previously undesirable tree species have also entered trade during recent years, including fruit trees;
4. The relative price of different timber species has changed little between 1985 and 2001;
5. Average timber prices have changed little in US dollar terms between 1990 and 2001; and
6. Volumes of timber traded have declined between 1985 and 2001.

#### **Trade in animals**

Unlike the timber trade, the trade in animals (not including wild meat) has been affected by CITES regulations. In addition, a variety of local, national and international measures, including trade restrictions and harvest controls, have affected live/dead animal trade dynamics:

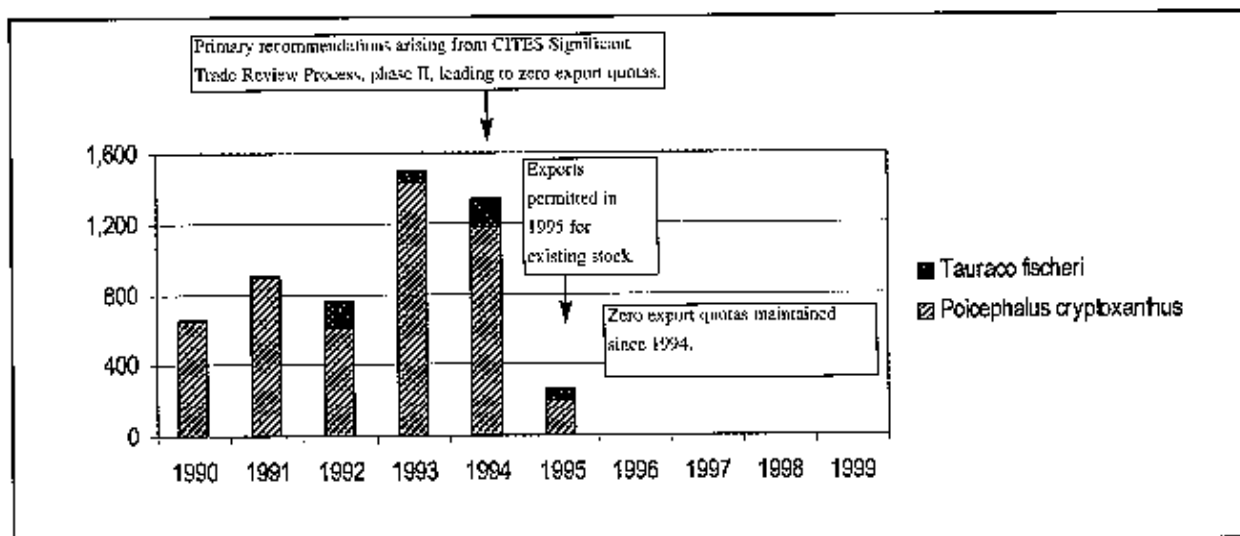
**CITES:** Tanzania ratified CITES in 1980 and has since made considerable progress in implementing the convention, including related decisions and resolutions. As part of the CITES significant trade review process to identify species whose trade levels may pose a threat to their survival, recommendations to suspend trade pending confirmation of appropriate conservation action have been made for eight species, including two bird species found in the East Usambara Mountains: Fischer's Turaco *Tauraco fischeri* and Brown-headed Parrot *Poicephalus cryptoxanthus* (CITES Notification No.1999/20). The impact of the export ban can be clearly seen from Table 16. Fischer's Turaco was commanding high prices (US\$20) in 1995 and was one of the most important income earners up until 1995 and then practically ceased to be traded thereafter (Figure 5).

**Airline company policies:** As a result of sustainability and animal welfare concerns voiced in the early 1990s, many airline companies have increased their own transport restrictions and standards. Many airlines stopped transporting live birds altogether, whilst others (such as British Airways, Ethiopian Airlines and Swiss Air) transport birds destined for zoos only. Among the few airline companies currently operating from Dar es Salaam that transport live birds are KLM, Air France and Royal Swaziland.

**Importing countries' regulations:** The majority of live wildlife exports from Tanzania are destined for the United States and Europe, both of which have stricter domestic measures on wildlife imports than those laid down by CITES. In the European Union, *Council Regulation (EC) No. 338/97*, and *Commission Regulation (EC) No. 1808/2001* implement CITES. *Council Regulation (EC) No. 338/97* provides the possibility to restrict imports of specimens of wild fauna and flora. The related *Commission Regulation (EC) No. 2087/2001* has resulted in import suspensions of 15 bird and reptile species from Tanzania including 7 from the Eastern Arc Mountains: *Falco fasciinucha*, *Poicephalus cryptoxanthus*, *Tauraco fischeri*, *Bubo vosseleri*, *Chamaeleo derentensis*, *C. werneri* and *Eryx colubrinus*.

**Figure 5**

**Export volumes and associated interventions for two bird species found in East Usambara Mountains (based on issued CITES export permits)**



Source: Milledge (in prep.).

**Amani Nature Reserve:** As with the timber trade, the increased enforcement of access and use regulations in conjunction with the establishment of Amani Nature Reserve has had a significant impact on surrounding communities. Traders from one village claimed discrimination from wildlife officers based upon their close proximity to the reserve, reporting that arrests and seizures of legally collected specimens have been made on suspicion (rather than proof) that the animals originated from within the reserve. The existence of Amani Nature Reserve has resulted in the implementation and enforcement of use restrictions in such an efficient manner that species subject to trade bans (e.g. Fischer's Turaco) no longer have any market value.

The historical timeline (Table 9) illustrates several changes in the animal trade that have occurred since the 1970s. Local trading from the East Usambara Mountains began to increase in line with demand in the early 1990s, some time after the trade liberalisation and economic reforms started in the mid-1980s. At this time, trade involved relatively few species, including snakes, beetles, chameleons and Fischer's Turaco. Since the early 1990s, sales patterns of live animals from the East Usambara Mountains have matched national export patterns.

Bird and reptile exports continued to increase in quantity up to 1994/95, matching increases in sales reported by villagers in the East Usambara Mountains. The number of species in trade greatly increased between 1992 and 1995 as the reptile trade picked up and later as demand grew for additional invertebrate species. Some rare beetles fetched particularly high prices, for example the Goliath Beetle *Goliathus orientalis* (collector US\$3, middleman US\$6 and exporter US\$17), *Mecynorrhina* spp. (collector US\$2.50, middleman US\$5 and exporter US\$15) and *Argyrophegges kolbei* (collector US\$1, middleman US\$2.50 and exporter US\$4).

After 1995, bird sales ceased almost completely and bird export volumes have dropped considerably. Reptile exports dropped slightly since 1995 and total reptile sales from the East Usambara Mountains similarly declined over the same period. However, the number of reptile species caught and sold from the East Usambara Mountains increased after 1995. The quantity of some reptile species sold increased, as did the quantity of some invertebrates. The demand for, and sales of, amphibians started in 1995. Trade volumes of all live animals from the East Usambara Mountains have decreased further since 1998. Table 12 shows the changes in the relative availability, price and quantity of different species in trade and income contribution in one Usambara village.

**Table 12 Changes in availability, price, volume and income from live and dead animals in Village B ranked from highest to lowest**

AVAILABILITY			PRICE			VOLUME			TOTAL INCOME		
1990-92	1995	2001	1990-92	1995	2001	1990-92	1995	2001	1990-92	1995	2001
Poisonous, Black Snakes	Megalorina Beetle	Reed Frog	Fischer's Turaco	Fischer's Turaco	Goliath Beetle	Black, Poisonous Snakes	Megalorina Beetle	Megalorina Beetle	Fischer's Turaco	Fischer's Turaco	Goliath Beetle
Green Mamba	Udicera Beetle	Two-horned Chamelion	Mesomantia Beetle	Bush Viper	Bush Viper	Kolbay Beetle	Udicera Beetle	Udicera Beetle	Mesomantia Beetle	Mesomantia Beetle	Mesomantia Beetle
Fischer's Turaco	Two-horned Chamelion	Argus Frog	Goliath Beetle	Mesomantia Beetle	Cobra	Monkey Chamelion	Flap-necked Chamelion	Reed Frog Beetle	Mesomantia Beetle	Bush Viper	Three-horned Chamelion
Kolbay Beetle	Mesomantia Beetle	Long Beetle	Green Mamba	Goliath Beetle	Mesomantia	Fischer's Turaco	Three-horned Chamelion	Two-horned Chamelion	Goliath Beetle	Kolbay Beetle	Kolbay Beetle
Mesomantia Beetle	Flap-necked Chamelion	Millipede	Black, Poisonous Snakes	Cobra	Three-horned Chamelion	Mesomantia Beetle	Mesomantia Beetle	Three-horned Chamelion	Three-horned Chamelion	Three-horned Chamelion	Megalorina Beetle
Goliath Beetle	Three-horned Chamelion	Flap-necked Chamelion	Unspecified Dove	Unspecified Dove	Spot Throat	Kolbay Beetle	Three-horned Chamelion	Kolbay Beetle	Kolbay Beetle	Flap-necked Chamelion	Megalorina Beetle
Udicera Beetle	Chamelion	Chamelion	Three-horned Chamelion	Chamelion	Chamelion	Chamelion	Chamelion	Chamelion	Chamelion	Chamelion	Chamelion
Monkey Chamelion	Poisonous, Black Snakes	Megalorina Beetle	Three-horned Chamelion	Poisonous, Black Snakes	Flap-necked Chamelion	Goliath Beetle	Goliath Beetle	Mesomantia Beetle	Dove	Udicera Beetle	Bush Viper
Three-horned Chamelion	Green Mamba	Udicera Beetle	Kolbay Beetle	Green Mamba	Midwayi Beetle	Unspecified Dove	Unspecified Dove	Flap-necked Chamelion	Green Mamba	Flap-necked Chamelion	Flap-necked Chamelion
Unspecified Dove	Fischer's Turaco	Muhangi Beetle	Flap-necked Chamelion	Kolbay Beetle	Dichlorina Beetle	Green Mamba	Green Mamba	Muhangi Beetle	Kolbay Beetle	Goliath Beetle	Two-horned Chamelion
Kolbay Beetle	Kolbay Beetle	Fischer's Turaco	Three-horned Chamelion	Three-horned Chamelion	Meghalina Beetle	Cobra	Cobra	Argus Frog	Cobra	Cobra	Midwayi Beetle
Goliath Beetle	Goliath Beetle	Unspecified Dove	One-horned Chamelion	One-horned Chamelion	Udicera Beetle	Unspecified Dove	Unspecified Dove	Amorodons Beetle	Two-horned Chamelion	Two-horned Chamelion	Cobra
Bush Viper	Bush Viper	Green Mamba	Udicera Beetle	Udicera Beetle	Two-horned Chamelion	Green Mamba	Green Mamba	Goliath Beetle	Spot Throat	Spot Throat	Reed Frog
Cobra	Cobra	Three-horned Chamelion	Flap-necked Chamelion	Flap-necked Chamelion	Argus Frog	Flap-necked Chamelion	Flap-necked Chamelion	Dichlorina Beetle	One-horned Chamelion	One-horned Chamelion	Argus Frog
Dove	Dove	Bush Viper	Megalorina Beetle	Megalorina Beetle	Amorodons Beetle	Megalorina Beetle	Megalorina Beetle	Long Beetle	Poisonous, Black Snakes	Poisonous, Black Snakes	Dichlorina Beetle
Spot Throat	Spot Throat	Dichlorina Beetle	Two-horned Chamelion	Two-horned Chamelion	Long Beetle	Two-horned Chamelion	Two-horned Chamelion	Bush Viper	Green Mamba	Green Mamba	Amorodons
One-horned Chamelion	One-horned Chamelion	Amorodons Beetle	Unspecified Dove	Unspecified Dove	Millipede	Unspecified Dove	Unspecified Dove	Cobra	Dove	Dove	Long Beetle
Mesomantia Beetle	Mesomantia Beetle	Mesomantia Beetle	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Millipede	Unspecified Dove	Unspecified Dove	Millipede
Kolbay Beetle	Kolbay Beetle	Kolbay Beetle	Goliath Beetle	Goliath Beetle	Reed Frog	Reed Frog	Reed Frog	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion
Goliath Beetle	Goliath Beetle	Goliath Beetle	Pygmy Chamelion	Pygmy Chamelion	Reed Frog	Reed Frog	Reed Frog	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion
Cobra	Cobra	Cobra	Cobra	Cobra	Reed Frog	Reed Frog	Reed Frog	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion
One-horned Chamelion	One-horned Chamelion	One-horned Chamelion	One-horned Chamelion	One-horned Chamelion	Reed Frog	Reed Frog	Reed Frog	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion	Pygmy Chamelion

NOTES: Bold type: CITES listed; Italics: Not CITES listed but no national export quota

Villagers listed a total of 24 animal species in trade (although this figure should be treated with caution, as there are inaccuracies in the ways in which different species are named locally) (Table 12). Whilst prices have dropped continuously in US dollar terms since 1990, the relative prices of different species have not changed significantly. In general, it is the rare, unusual or illegal species that command the highest prices, such as the Mesonarina Beetle *Mecynorrhina* spp. (middlemen from East Usambara Mountains selling to exporters for up to TZS15 000 (US\$31) in 1995), Usambara Bush Viper *Atheris ceratophorus* (up to TZS25 000 (US\$41) in 1998) and Fischer's Turaco (up to US\$20 in 1995). Several other beetles fetch high prices, whilst most chameleons are mid-range, with frogs and other invertebrates being the lowest priced. Those species with the higher per specimen prices have brought in the most income overall. Profits increase almost exponentially going up the trading chain. Middlemen may receive almost double the amount received by collectors, whilst minimum export prices are a further six times greater. For the species listed in Table 13, US retail prices average 12 times the minimum export prices and 146 times the original collector's price.

**Table 13**

**Average prices (US\$) for selected species at different levels of the trade chain**

Species	Collector's Price	Middleman's Price	Minimum Export Price	US Retail Price
Usambara Three-horned Chameleon <i>Chamaeleo deremensis</i>	1.64	2.46 (x1.5)	6 (x2.4)	189 (x31.5)
Giant Chameleon <i>Chamaeleo melleri</i>	1.15	2.46 (x2.1)	15 (x6.1)	109 (x7.3)
Two-horned Chameleon <i>Bradypodion fischeri</i>	0.16	0.82 (x5.1)	6 (x7.3)	78 (x13.0)
Flap-necked Chameleon <i>Chamaeleo dilepsis</i>	0.05	0.16 (x3.2)	5 (x31.3)	40 (x8.0)
Pygmy Chameleon <i>Rhampholeon brevicaudatus</i>	0.16	0.33 (x2.1)	4 (x12.1)	39 (x9.8)
Forest Gecko <i>Cnemaspis africana</i>	0.08	0.25 (x3.1)	3 (x12.0)	18 (x6.0)
House Gecko <i>Hemidactylus</i> spp.	0.08	0.25 (x3.1)	1 (x4.0)	14 (x14.0)
Tree frog <i>Hyperolius</i> spp.	0.11	0.25 (x2.3)	1 (x4.0)	13 (x13.0)
Reed frog <i>Hyperolius</i> spp.	0.05	0.16 (x3.2)	1 (x6.3)	13 (x13.0)
<b>AVERAGE</b>	<b>0.39</b>	<b>0.79 (x2.0)</b>	<b>4.7 (x5.9)</b>	<b>57 (x12.1)</b>

Species traded in the highest quantities include beetles (especially *Megalorrhina harissi*, *Eudicella* spp. and *Argyrophegges kolbei*), chameleons (especially Usambara Three-horned Chameleon and Two-horned Chameleon) and frogs (mainly *Hyperolius* spp.). According to villagers' perceptions, almost all species traded in the largest quantities are relatively common in the wild. Traders from one village reported that Fischer's Turaco numbers have grown considerably since the mid-1990s and it is a positive sign that the export ban implemented in response to declining wild populations has had a positive conservation impact. According to villagers' perceptions, with the exception of Fischer's Turaco there has been no significant change in the availability of different species. It can therefore be reliably assumed that changes in trade dynamics mentioned above have been largely due to a combination of regulatory and market changes rather than changes in their availability.

Overall, ranking exercises reveal six key trends in the trade in animals from the East Usambara Mountains during the 1990s:

1. Sales patterns of live/dead animals in the East Usambara Mountains closely match national export patterns;
2. The number of species and classes traded has increased since 1990;
3. Both local trade and export volumes of live/dead animals peaked in the mid-1990s;
4. Bird sales from the East Usambara Mountains almost completely ceased after 1995, the same year that amphibians started to be traded;

5. With the exception of Fischer's Turaco, trade dynamics do not seem to have been affected by changes in availability. Instead, regulatory and market changes have had the greatest impact; and
6. Local prices in US dollar terms have continually declined since 1990 although the relative price of different species has changed little.

In addition to the above regulatory measures, another important factor affecting trade dynamics in the East Usambara Mountains is shifting overseas market demand. For example, the rise in sales in beetles, chameleons and amphibians has coincided with a corresponding increase in their consumer demand in Europe, North America and East Asia. Indeed, this preliminary study indicates that it is the market demand and regulatory measures affecting local access that have had the greatest financial impacts on livelihoods. In this instance, international regulation (CITES) has had fewer negative effects, with the exception of turaco traders. However, it is extremely difficult to determine the relative roles of each factor using data collected at the local and national levels only, in particular the interface between CITES measures, national export bans, airline companies' regulations, importing countries' regulations and changing international market demands. These issues are discussed in detail in Chapter 8.

### Conservation impacts

One of the problems in assessing the level of conservation impact is the lack of scientific data and evidence. Whilst biological surveys have been conducted over large areas, most have been determining baseline biogeographical data. With the notable exception of forest cover analyses, few repeated studies have been made in the East Usambara Mountains from which trends and impacts can be deduced. However, using available survey data together with information gathered from this study, there is evidence of some positive conservation impacts as a result of wildlife access and trade regulation.

The combination of the East Usambara timber harvest ban and hardwood export ban have led to reduced forest loss, which in turn has had a local effect on climate with a return to three rainy seasons per year instead of two. However, there is no evidence showing increasing volumes of harvestable, wild stands of commercially important timber species. It is worth noting that recent research indicates that the spread of exotic species is apparently assisting indigenous timber species to regenerate by creating the necessary shade, contrary to popular belief in the late 1980s (Binggeli 1989; Hall 1995; Luukkanen 2001). Associated with this returning forest cover has been the return of other forest animals such as hornbills and primates.

Further, populations of Fischer's Turaco have reportedly recovered to higher levels than during times of high harvest in the mid-1990s, partly attributable to the decline in rate of forest loss but largely due to the export ban. It seems that most live animal export quotas, particularly chameleons, are set at sensible levels and harvest for export has not caused populations to decline according to villagers' perceptions. It is probably still too early to see the conservation impacts of the more recent establishment of the Amani Nature Reserve although villagers feel that raised conservation awareness and education as a result of Amani Nature Reserve outreach programmes will have a positive effect.

### Financial impacts

#### *Timber trade*

As described above, four main regulations have affected timber trade dynamics: East Usambara Mountains harvest ban (1987); national hardwood export ban (1993); Amani Nature Reserve gazetted (1997); and increased permit and licence fees (1999). Overall, these regulations have caused a decline in the timber trade, which has had mixed financial impacts on local communities. After large-scale commercial logging ceased in the mid-1980s, more local communities seemed to benefit financially in the short-term as they took advantage of direct access to the timber reserves and urban markets – albeit illegally in many cases. Previously, many outsiders were often brought in as cutters and carriers and there was limited scope for local people to be involved.

However, over the longer term, these regulations have caused negative financial impacts to the communities living in the East Usambara Mountains due to a combination of factors. These include lower overall volumes of timber sold, a decrease in the number of people involved in timber trade, lower overall village incomes from the timber trade, a higher proportion of cheap timber species in trade and decreased size and quality of planks.

Current timber prices have increased to 4.5-9.7 times since 1990 in local currency terms, matching local perceptions of rising timber prices (Table 14). However, average prices have remained the same in US dollar equivalents (using exchange rates adjusted for inflation). This is surprising considering the reduced availability in the wild of the more valued species. However, it is possible that the dollar prices provided here are inaccurate since no data could be found on Tanzanian inflation rates over the period in question and inflation adjustments therefore had to be made on the basis of US inflation rates.



Table 14

Changes in timber prices between 1990 and 2001 (in 2001 prices)

SPECIES	PRICE PER PLANK (3.66m x 0.30m)			
	1990*		2001**	
	TZS	US\$	TZS	US\$
<i>Milicia excelsa</i>	1000	6.90	5400 (x5.4)	6.20 (x0.9)
<i>Ocotea usambarensis</i>	1000	6.90	4800 (x4.8)	5.50 (x0.8)
<i>Beilschmiedia kweo</i>	800	5.60	5400 (x6.8)	6.20 (x1.1)
<i>Khaya anthotheca</i>	800	5.60	3600 (x4.5)	4.10 (x0.7)
<i>Newtonia buchananii</i>	700	4.90	3500 (x5.0)	4.00 (x1.4)
<i>Azelia quanzensis</i>	500	3.50	4200 (x8.4)	4.80 (x1.4)
<i>Grevillea robusta</i>	500	3.50	2500 (x5.0)	2.90 (x0.8)
<i>Pterocarpus tinctorius</i>	360	2.40	3500 (x9.7)	4.00 (x1.7)
<i>Cephalosphaera usambarensis</i>	360	2.40	2500 (x6.9)	2.90 (x1.2)
<i>Albizia lebbek</i>	360	2.40	2500 (x6.9)	2.90 (x1.2)
<i>Bombax rhodognaphalon</i>	360	2.40	2500 (x6.9)	2.90 (x1.2)
<b>AVERAGES</b>	<b>613</b>	<b>4.20</b>	<b>3673 (x6.0)</b>	<b>4.20 (x1.0)</b>

Notes: \* 1990 exchange rates: TZS195 per US dollar. 1990 US dollar values adjusted for inflation to give equivalent 2001 prices.  
 \*\* 2001 exchange rates: TZS877 per US dollar.

Table 15

Changes in earnings from the timber trade in Village C (US\$ in 2001 prices)

SOCIAL GROUP	DESCRIPTION	YEAR		
		1990 (US\$)	2001 (US\$)	
<b>Women</b> (N = 600)	Number of people	Porters	25	
	Income per person		72	
	Total income		1 800	
<b>Men</b> (N = 400)	Number of people	Middlemen	3	4
		Pit-sawers	5	26
	Income per person	Middlemen	21 760	296
		Pit-sawers	72	176
Total income		65 640	5 760	
<b>Youth</b> (N = 600)	Number of people	Porters	10	20
	Income per person		72	83
	Total income		720	1 660
<b>Elders</b> (N = 300)	Number of people	Middlemen	1	10
	Income per person		21 760	296
	Total income		21 760	2 960
<b>TOTAL NUMBER OF PEOPLE</b>			<b>44</b>	<b>60</b>
<b>TOTAL INCOME</b>			<b>89 920</b>	<b>10 380</b>
<b>AVERAGE PER PERSON</b>			<b>2 044</b>	<b>173</b>

All villages reported a lower overall volume of timber sold now compared to the peak activity in the mid-1980s, due to local harvest and trade restrictions in addition to reduced availability. For example, using estimations of weekly sales at different times of the year, one village reported approximately 41 600 planks sold in 1990 compared to only 3640 in recent years. The number of people involved in the timber business has increased in some villages and declined in others but individual incomes have decreased in all villages. For example, average incomes for timber traders in Village B are currently US\$426 per capita, down from US\$10 557 in 1985. Similarly, average incomes for timber traders in Village C have declined from US\$2044 in 1990 to US\$173 (Table 15). Collective village incomes from the timber trade declined by 98 per cent and 88 per cent for Villages B and C respectively.

A higher proportion of cheaper timber species in trade and decreased plank sizes have also contributed towards inferior incomes overall. Timber traders currently amount to around one per cent of the entire working population. Although no more than three to five per cent of the working population received income from the timber trade in the later 1980s, they were amongst the highest wage earners and the subsequent decrease in profits are reported to have heavily impacted collective money circulation and village tax revenues. Nevertheless, timber traders still earn far more than the average income from agriculture (Table 17).

While trade in timber continues, much of this is now obtained illegally. Even for species that can still be traded legally, the cost of a licence is a barrier to many local people. In one village it was reported that, in 1999, licence fees had increased from TZS1800 (US\$2.77) per month plus TZS500 (US\$0.77) per cubic metre of wood removed from the forest to TZS100 000 (US\$154) for six months plus TZS50 000 (US\$77) per cubic metre. With an average annual household income of TZS300 000 (US\$462) villagers say they cannot afford to buy licences at these prices.

### Trade in animals

Traders of live and dead animals from the East Usambara Mountains have experienced mixed financial fortunes since the early 1990s. The trade peaked in the mid-1990s before declining to present low, residual levels. A mixture of international, national and local interventions, including trade restrictions and harvest controls, has affected trade dynamics. As described earlier, these have included CITES recommendations, national export quotas, the establishment of Amani Nature Reserve, transport bans and importing countries' regulations. In addition, shifting market preferences have affected trade levels in the East Usambara Mountains.

**Table 16**  
**Changes in animal prices in Village B**

SPECIES	PRICE PER SPECIMEN					
	1990 *		1995 *		2001	
	(TZS 195 per US\$)		(TZS 574.8 per US\$)		(TZS 877 per US\$)	
	TZS	US\$	TZS	US\$	TZS	US\$
Bush Viper <i>Atheris ceratophorus</i>			15000	30.50	3000	3.40
Fischer's Turaco <i>Tauraco fischeri</i>				20.00		20.00
'Mesonarina' Beetle <i>Mecynorrhina</i> spp.	3000	20.90	5000	10.20	2000	2.30
Goliath Beetle <i>Goliathus orientalis</i>	1500	10.50	3000	6.10	3000	3.40
Green Mamba <i>Dendroaspis angusticeps</i>	1000	7.00	1000	2.00		
'Kolhay' Beetle <i>Argyrophagges kolbei</i>	500	3.50	1000	2.00	500	0.60
Three-Horned Chameleon <i>Chamaeleo deremensis</i>	500	3.50	500	1.00	1000	1.10
Flap-Necked Chameleon <i>Chamaeleo dilepis</i>	200	1.40	200	0.40	300	0.30
'Udicera' Beetle <i>Eudicella</i> spp.			200	0.40	100	0.10
Two-Horned Chameleon <i>Bradypodion fischeri</i>			100	0.20	100	0.10

Note: \* 1990 and 1995 US\$ values adjusted for inflation to give equivalent 2001 prices.

Table 17

## Aggregate changes in income over time from wildlife trade in Village B (US\$)

SOCIAL GROUP DESCRIPTION	ECONOMIC ACTIVITY, YEAR AND US\$ EXCHANGE RATE		
	AGRICULTURE	ANIMAL TRADE	TIMBER TRADE
	2001 (877)	1995 (574.8)	1985 (51.7)
		1998/2000 (744.8)	2001 (877)
<b>Women</b> (N = 40)	300		
Number people involved			
Income per person	57		
Total income	17 100		
<b>Men</b> (N = 300)	270		
Number people involved			
Income per person	285		
Total income	76 950		
<b>Youth</b> (N = 600)	50		
Number people involved			
Income per person	23		
Total income	1150		
<b>Elders</b> (N = 100)	80		
Number people involved			
Income per person	228		
Total income	18 240		
<b>TOTAL No. of people involved</b>	<b>700</b>	<b>52</b>	<b>31</b>
<b>% of working population</b>	<b>50%</b>	<b>1%</b>	<b>1%</b>
<b>TOTAL ANNUAL INCOME</b>	<b>113 440</b>	<b>43 632</b>	<b>327 892</b>
<b>AVERAGE INCOME PER PERSON</b>	<b>162</b>	<b>839</b>	<b>10 577</b>
			<b>7662</b>
			<b>426</b>

Note: Average household income = TZS 360 000/year (US\$ 410/year). Total population = 1966 of which working population = 1400.

Whilst the period from 1990 to present has witnessed a widening diversity of animal species traded (both live and dead), prices have dropped in general. Table 16 shows that many prices have stayed the same in local currency terms but have decreased dramatically in US dollar equivalents. Price declines were greatest for beetles. For example, prices for *Mecynorrhina* spp. dropped from US\$21 each in 1990 to US\$10 in 1995 and down again to US\$2 in 1998.

Although prices in general declined between 1990 and 1995, profits soared due to the much higher volumes and numbers of species traded. Continued price declines, reduced demand in some species and access restrictions have caused profits to fall further since 1995. In Village B, the average income from the trade in live and dead animals declined from US\$830 per person in 1995 to just US\$125 in 1998 (Table 17). At less than a quarter of the average household income, this led to many traders, both middlemen and collectors, stopping trade altogether in 1998 and 1999. In some cases, middlemen have bypassed payments to collectors by catching the animals themselves or have greatly reduced payments to collectors. In Village B, the number of traders has declined by two-thirds between 1995 and 1998 and collective village income from the live/dead animal trades has decreased by 95 per cent. Currently, only around one per cent of the working population is involved in the animal trade, which earns less than the average income from agriculture.

Since 1998, the overseas market for many valuable beetles originating from the East Usambara Mountains has started to become saturated, resulting in further declines in price and demand. In addition, the gazetting and enforcement of access restrictions in the Amani Nature Reserve have led to some neighbouring communities almost completely halting trade in live and dead animals since the late 1990s.

### **Non-financial impacts**

Some of the conservation and financial impacts detailed above have had knock-on effects in the three villages, as have the regulations themselves (Table 18). The most significant positive non-financial impact, noted in all three villages, was the increased rainfall and available water as a result of regeneration of the forest following the timber trade harvest and export bans. During the intense logging of the 1970s and 1980s, the montane forests were severely degraded, impacting on local climatic conditions. Whereas previously there had been three rainy seasons and hence three agricultural seasons, this had been reduced to two and the timing and duration of the rains had altered. In recent years, villagers noted that the agricultural seasons were gradually returning to normal and so food production had increased.

However, villagers also noted that, linked to the regeneration of the forest, there was an increase in wildlife and a subsequent increase in problem (crop raiding) animals, particularly baboons. Furthermore, since the designation of Amani Nature Reserve, villagers have been very limited in their ability to chase problem animals away, since they are allowed to go just 400 metres into the reserve. In one village it was reported that the decline in timber trade has meant that older people who were previously involved have gone back to subsistence farming but now the impact of the problem animals has meant that even this option is becoming increasingly less viable.

Trade-offs exist for many livelihood impacts. For example, while villagers complain that they can no longer afford timber for construction and furniture making, they also note that as a result they have learned to build superior houses from bricks. However, timber is still needed for doors, frames and for furniture. The withdrawal of the timber companies has also, for some, meant that roads to remote villages are no longer maintained and this has had a negative effect on people's ability to access markets for agricultural produce and other goods. Villagers also noted that because they cannot cut trees along the side of the roads they do not dry quickly after rains and this has also contributed to their deterioration. Villages not solely dependent on timber companies for road construction and maintenance did note, however, that the decrease in heavy logging trucks had slowed the rate of damage to roads.

According to villagers' perceptions, some of the most significant negative impacts of trade, use and access regulations have been financial, including reduced employment, market access and business opportunities. These have reduced individual and collective incomes, with knock-on effects on their ability to pay for other services and to provide important livelihood components, for example, purchasing medicines, paying school fees and purchasing land and housing materials.

### **Temporal factors associated with regulation**

Experience from the East Usambara Mountains shows how wildlife access and trade regulations not only cause varying degrees of livelihood impacts, but also produce both short- and long-term effects. In some cases, there are short-term and long-term trade-offs in the effects of trade regulation. Thus, a wildlife regulation may result in a direct, immediate livelihood impact (positive or negative), which is felt for a relatively long time. Alternatively, the impact may be only temporary, or perhaps felt some time after the regulation is introduced. The history of wildlife access and trade regulations in the East Usambara Mountains illustrates well these different scenarios.

**Immediate, short-term positive impacts.** One of the clearest examples of an immediate, direct, positive benefit resulting from trade regulation came after the commercial felling of trees was banned from the East Usambara Mountains in 1987, leading to a cessation of all activities by Sikh Saw Mills (SSM). Since local villagers received only limited benefits during the operational period of SSM (mostly employment and firewood), they were able to benefit more directly after the ban as a result of increased open access to the forest timber resources, albeit mostly by illegal harvesting. After 1987, local villagers rapidly started to harvest and cut timber, mostly for markets in Tanga and Dar es Salaam.

**Immediate, short-term negative impacts.** Some villagers reported how certain negative impacts following wildlife regulations turned out to be positive in the longer-term. For example, following restricted access to timber resources, some households were forced to build their houses out of bricks instead. Whilst this was initially seen as a negative impact in terms of extra time and financial implications, their higher durability is now seen as having greater long-term benefits.

**Delayed, long-term negative impacts.** All three villages demonstrated varying levels of illegal trade in wildlife products despite a whole series of trade-related regulatory measures. The significant profit margins provide the incentive to continue operating illegally whilst the relatively small size of most villages enables such informal trade to continue in a contained manner, largely unchecked by district or regional wildlife and forestry officers. It is evident that some of the villagers are involved in this illegal activity to some extent, including youth, but the long-term social implications of this are unclear.

**Delayed, long-term positive impacts.** The gradual return of forest cover after the harvest ban is being credited by the villagers as having resulted in a partial restoration of local climate patterns that are essential for subsistence agriculture. The benefits accrued to villagers in terms of improved agricultural output were felt some time after the ban, but nevertheless continue to be felt up to present times. Whilst independent studies also support both these findings, the continued decline in abundance of valued timber species and the stabilised climatic conditions do not at first appear compatible (Hamilton and Bensted-Smith 1989; Hamilton and MacLadyen 1989). This may be explained firstly by the fact that pit sawing techniques used since the late 1980s are less destructive to non-target species than large-scale clear felling. Secondly, the rapid growth and expansion of exotic timber species has also increased forest cover. Whilst early research suggested that the exotic *Maesopsis eminii* was a threat to the integrity of montane forests, more recent research shows that they actually assist colonisation of indigenous trees by providing the necessary shade cover (Linnkangn 2001).

**Table 18**  
**Positive and negative impacts of trade regulations on important livelihood components in the East Usambara Mountains**

BANKED LIVELIHOOD COMPONENTS	RANKED POSITIVE IMPACTS	RANKED NEGATIVE IMPACTS
WATER/RAIN FOOD	<p>WATER/RAIN: Increased rain and available water as a result of improved forest cover.            EDUCATION: Greater conservation education and awareness on farming techniques, tree planting and energy-saving stoves. New primary school built at one village.</p>	<p>JOBS: Less employment in the timber sector (i.e. sawmill companies)            ACCESS TO MARKETS: Reduced market for fresh foods (after closing of sawmills), live animals and timber. Roads no longer maintained by timber companies so difficult to access markets for agricultural and other products.            FOOD: Agricultural output affected by crop destruction from baboons and bush pigs, resulting in more time spent on farms. Decreased availability of fresh meat. Decrease in food due to inability to fell trees on farms.            HOUSING: Less suitable wood available for building doors, window frames and furniture. More difficult to previous state (i.e. verandah harvests per year). build traditional homes using wood and poles.</p>
HOUSING	<p>HOUSING: Decrease in availability of wood has encouraged construction of better houses from bricks and cement.</p>	
HEALTH	<p>FOOD: More food produced because agricultural seasons have returned to</p>	
EDUCATION	<p>BUSINESS OPPORTUNITIES: New business opportunities in condomium.            COMMUNITY ORGANISATIONS: New community organisations started, including water conservation, tree planting and energy-saving stoves.</p>	<p>FIREWOOD: Limited access to reserve to collect firewood (400m maximum for two days per week).            BUSINESS OPPORTUNITIES: Reduced opportunities since less circulation of money within village and therefore less money available to start up businesses.</p>
FIREWOOD	<p>TRANSPORT: Improved road conditions due to fewer heavy timber lorries.</p>	<p>EARNINGS: Reduced income especially from timber sales.</p>
TRANSPORT	<p>COLLECTIVE INCOME: 20% income from Akand Naturo Reserve tourism earnings started in 2001.</p>	<p>(LAND): Land appropriation by Reserve</p>
EARNINGS	<p>COMMUNICATIONS: Increased access to telephone since telephone line brought closer by Reserve.</p>	<p>EDUCATION: Some villagers not able to pay for school fees due to reduced earnings.</p>
ACCESS TO MARKETS	<p>LOCAL CULTURE: Cultural rites and beliefs maintained.</p>	<p>COLLECTIVE INCOME: Reduced village tax income from sale of wildlife resources.</p>
BUSINESS OPPORTUNITIES		<p>TRANSPORT: Road quality declined - drives slowly since roadside trees are not cut. Transport opportunities reduced slightly after sawmills stopped.</p>
JOBS		<p>LOCAL CULTURE: Western influence damaging to Muslim culture, especially with regards to women's clothing.</p>
COLLECTIVE INCOME		
ELECTRICITY		
COMMUNICATIONS		
COMMUNITY ORGANISATION		
LOCAL CULTURE		

**Regulation versus enforcement.** The negative livelihood impacts of the establishment of Amani Nature Reserve were reportedly not felt until at least a year after it was gazetted. This delayed impact was largely due to enforcement of regulations, which only occurred from 1998 with the assistance of FINNIDA. Of course, both the levels of enforcement and the time delay between establishing regulatory measures and ensuring their enforcement are major factors in determining the temporal effect on people's livelihoods. Local regulations also serve to reinforce higher-level (national or international) regulations.

These few examples illustrate the importance of carefully evaluating and comparing positive and negative livelihood impacts over a relatively long period of time, since otherwise accrued and cumulative effects of regulation may not be fully realised. In general, it is the longer-term and delayed livelihood impacts that are the most difficult to understand, quantify and predict.

### Summary

Experience from the East Usambara Mountains clearly shows a mixture of positive and negative monetary and non-monetary implications of wildlife access and trade regulations at local, national and international levels. It is also evident that regulatory measures affect different sectors of society due to the different roles in wildlife trade played by the rich and poor, by women, men, elder and youth. Men are most affected by timber trade regulations and youth most affected by live/dead animal trade regulations.

According to local perceptions, wildlife access and harvest regulations have had a greater overall impact than national and international trade regulations. Further, evidence suggests that the effect of some trade regulations has actually led to significant positive impacts on local livelihoods, whilst subsequent wildlife access regulations have caused the most negative impacts.

Overall, wildlife access and trade restrictions in the East Usambara Mountains have had a significant financial effect on local people. Average incomes for timber traders in one village have declined from US\$10 557 in 1985 to currently US\$426 per annum, whilst average incomes for animal traders have dropped from US\$830 in 1995 to currently US\$125. Local earnings have declined in terms of direct earnings from sales, employment and business opportunities. There has also been a knock-on effect on other small businesses both through a decrease in potential customers due to emigration, reduced local and urban market access and a decrease in money circulation in the local economy. At the same time collective income in the form of the village sales tax has been affected since this is dependent on sales made. The villagers see this as a negative impact since the funds generated from the village tax scheme are used to finance community development projects such as dispensaries. Declining cash incomes from various wildlife trades have also resulted in reduced ability to pay school fees and decreased ability to purchase iron sheets for house roofing.

However, a number of positive impacts have been felt as a result of the effects of wildlife access and trade regulation. In particular, the positive impacts of forest regeneration on water availability, rain and climatic conditions have resulted in enhanced agricultural productivity. This in turn, has enhanced food production and incomes from cash crops.

While the positive effects of regulation offset some negative impacts, the overall feeling in the villages studied is one of hardship since the trades started to decline. The restrictions in place are development and conservation-motivated and a strong case can be argued for regulating timber harvesting since this had been proceeding at an unsustainable level with severe impacts on forest quality and cover. Approximately 50 per cent of unreserved forest disappeared from 1954 to 1978 (Johansson *et al.* 1997). However, it is also true to say that most of the degradation was brought about through large-scale mechanised logging by timber companies. Local people are now bearing the brunt of this and are unable to afford harvesting licences and are not allowed to fell trees on public land (even on public agricultural land where the tree is inhibiting crop development). Conservation justifications can also be found for some of the animal species subject to trade restrictions. However, while only threatened and potentially threatened species are covered by international regulations, the ban on collecting imposed within Amani Nature Reserve effectively bars access to the market for non-protected species and implements a total harvest ban on species which are protected but for which an export quota exists.

Although the negative financial impacts of trade regulations appear to outweigh all else, it is interesting to note that when asked to identify and then rank important livelihood components, financial earnings did not feature very highly. The most important components were water, food, housing, education, health and fuel. However, additional income



(over and above that needed to purchase essential supplies) is spent on more agricultural land (to grow more food), better housing and school fees. Therefore while cash income might not rank highly in itself, its importance is emphasized by the fact that earnings are spent maximising the most important livelihood components.

In general, the relative importance and weighting of positive and negative livelihood impacts of wildlife access and trade regulations remains a challenging task and this study has been able to shed some light on a few key issues. In many cases, there is no direct or indirect financial value attached to livelihood impacts, which makes it even more difficult to rank their importance. A further difficulty lies in teasing apart the many different causal factors and cross-linked issues with respect to impacts of wildlife access and trade regulations. Some of the main complicating issues that have arisen from this research are discussed below and include differing value systems, local and international dynamics, market access, business acumen, local control and temporal factors associated with regulation. Ironically, the justification for choosing the East Usambara Mountains for this study actually served to complicate analysis and understanding since there are so many inter-relating factors.

### **Local and international dynamics**

The impact of regulations at the local level is directly related to the perceived importance of an area or resource and the functions it provides. The subsistence nature of living means that land access rights, tenure and agricultural concerns have the greatest impacts on livelihoods. Regulations directly affecting resource access and subsistence use seem to have had the greatest impacts in the East Usambara Mountains. Indeed, one of the main problems experienced as a result of trade regulation and the gazettement of Amani Nature Reserve is the increased incidence of crop damage by primates.

As to be expected, overall, CITES has not had a major negative livelihood impact in the East Usambara Mountains although it has affected certain sectors of the community as described earlier. It is important to note, however, that two key factors seem to contribute to this outcome: the degree of dependence on a particular trade and alternative trade options. In the case of those people who have suffered most from wildlife trade regulation, they tend to be members of the community with fewer alternative income-generating options and a higher dependence on the wildlife trade in the first place. The majority of villagers are heavily involved in agriculture and will always resort to cash and subsistence crops in times of hardship.

In the case of the East Usambara Mountains, other factors have also played their part. At a global level, the decline in market demand for live birds during the mid-1990s coincided with (or caused) a rise in reptile and amphibian trades. Thus, shifting consumer preferences and market dynamics have helped ensure that people involved in the capture and sales of live animals have continued to stay in business by simply shifting from selling birds to reptile, amphibian and invertebrate trading. In fact, these changing market dynamics have probably led to more benefits being felt in the East Usambaras than the West Usambaras, since the former contains many more commercially important reptile species and historically has played a lesser role in the bird trade. Secondly, in terms of the number of species involved in live exports from Tanzania, CITES-listed species form the minority. Thus, specific CITES interventions tend to affect one or a few species only and leave many more options unaffected by regulation. As discussed below, a third factor is the level of enforcement. In the case of the Amani Nature Reserve, strict enforcement of regulatory measures in recent years has been felt strongly by local communities. Many other factors also likely play a role in determining the relative effect of CITES measures at the local level.

It is therefore conceivable that under different conditions, CITES could result in a much greater negative effect on local communities. In such a hypothetical scenario, if the adverse consequences of negative livelihood impacts are

not fully understood and counter-measures in place, the knock-on social effects may actually work in opposition to conservation objectives. One problem is the general lack of available information regarding these different scenarios.

### **Market access, business acumen and local control**

In general, communities in the East Usambara Mountains have a high awareness of local wildlife trade and land access restrictions, particularly those concerning the Amani Nature Reserve and other forest reserves. This matches the results of a study conducted in 1994 in which 95 per cent of respondents from 14 villages were aware of forest reserves (Kajembe and Mwaseba 1994). However, villagers are much less aware of international markets and regulations, including CITES, which makes them more susceptible to changes in regulation and market dynamics. A good example of this is the trade in live and dead animals. As discussed above, villages in the East Usambara Mountains inadvertently benefited from the shift in trade towards reptiles, amphibians and invertebrates. However, villagers are totally unaware of current shifts in market dynamics with respect to invertebrates. Unlike the majority of live exports that are destined for the pet trade, most dried beetles are destined for the specialist collectors' market. Demand for beetles from the Usambara Mountains has recently dropped since the limited market has been saturated, whilst demand has increased from other unexploited mountain ranges. Beetle traders from the East Usambara Mountains are unaware of these market shifts and are therefore more likely to suffer the consequences in the near future.

It is worth noting that urbanisation and migration in modern Tanzania have had both positive and negative impacts on rural livelihoods. On the one hand, they have increased market access and knowledge, thereby presenting opportunities for income-generating activities and access to alternative food and subsistence products. On the other hand, this has hindered the passing down between generations of the traditional knowledge of non-timber forest products, thereby reducing the overall value of many natural resources.

Another factor contributing towards susceptibility to regulatory and market changes is the generally low business acumen. In addition to poor knowledge regarding international trade regulations and markets, communities in the East Usambara Mountains have little or no micro-business management skills. Currently, there is no access to loans and little available financial capital since profits are generally used rather than converted to financial savings. Profits were put towards a mixture of long-term assets (e.g. housing material, livestock and land) and short-term (e.g. alcohol and entertainment) uses. However, even the longer-term assets are rarely converted back to financial capital, which is needed in times of hardship.

From the era of mechanised logging up to present day management of the East Usambara catchment project and Amani Nature Reserve, villagers surrounding the reserve have only experienced minor employment opportunities and roles in decision-making. Whilst many villages have been included in planning processes using participatory techniques, there has been little ongoing local participation, resulting in a perceived lack of recognition and imbalance in local control. With respect to wildlife trades, villages surrounding the reserve have lost out the most, whilst relatively few government or donor-driven initiatives have assisted with alternative income-generating activities. One notable exception is farm forestry, which has started to show small-scale signs of success. For example, the villages of Vuga and Hemsambia communally manage about 30 hectares of natural forest in the public lands (Johansson *et al.* 1997).

## Recommendations

The facilitation of micro-business set-up, financial savings, micro-finance and business management training (particularly for alternative income-generating activities around protected areas) would greatly enhance livelihood prospects and reduce communities' susceptibility to change in the East Usambara Mountains. Restrictions should always be supplemented with sufficient alternatives. It is also recommended that natural resource management training, at the very least, is provided to more villagers surrounding Amani Nature Reserve as, while very few are employed, they have the potential to become more involved in decision-making processes.

One strong potential with regard to increasing local business opportunities and control in respect to wildlife trade is captive production<sup>1</sup> of live animals. Tanzania already has a number of approved CITES 'farmed' (F1) and captive-bred (C) quotas for reptiles. The 2000 live export quota of F1/C reptiles included 26 out of a total of 84 species and 7372 out of 160 562 specimens. At present, all F1/C reptiles are produced from exporters' facilities. In recent times, members of the Tanzanian government have expressed concerns regarding the future of captive production. Whilst it is seen to reduce pressure on wild populations, there are concerns that captive production may reduce incentives for conservation of wild populations and secondly, that benefits accrued are retained by relatively few people compared to wild collection. An ideal solution, perhaps offered by the unique situation in the East Usambara Mountains, is to initiate an experimental joint-management captive production programme involving both local communities and staff from the Amani Nature Reserve and East Usambara Conservation Area Management Project. Such a partnership would ensure greater involvement, control and benefit sharing at the local level whilst ensuring district and national involvement. Similar programmes exist in other areas of Africa, the nearest being Arabuko Sokoke Forest butterfly farming project in Kenya (Ashley 1999).

A joint-management captive production or sustainable harvest project could also provide the opportunity for attempting to implement non-detriment findings and establish quotas for sustainable harvesting at the local level. Presently, all live export quotas are determined at the national level (recognising species biogeographics). A local project holds the potential for local communities to have a greater say in national quotas, especially for quota species with restricted ranges but occurring in the East Usambara Mountains (e.g. chameleons *Bradypodion fischeri* and *Chamaeleo deremensis*).

It is also worth noting that this kind of project has the potential to create added-value products, thereby increasing monetary returns. Animals produced and certified as sustainably produced with community benefits would be valuable and attractive to international markets and justifiably sold at higher prices.

<sup>1</sup> The term captive production includes captive breeding, farming and ranching.

**Research requirement: Comparative analysis of factors influencing livelihood impacts**

Whilst this study has provided the essential first step in establishing a broad knowledge base of livelihood dynamics at the local level, a more detailed understanding of causality and effect would only be feasible from detailed household surveys. In order to tease apart the many variables, it would be necessary to make a systematic study to look at differences in the effect of regulation affecting specific species between geographic areas on a case-by-case basis. Some of the issues to be investigated include:

1. Areas with different land tenure and access rights;
2. Areas with different levels of agriculture, numbers of pastoralists and nomadic people;
3. Areas affected and not affected by national regulation, local regulation and/or international regulation only due to the composition of species or land types;
4. Areas near to and far from urban markets and influence;
5. Areas with different wealth status;
6. Areas with different levels of law enforcement; and
7. Areas with and without features of major local importance, national importance, and/or international importance.

## PART THREE: CONCLUSIONS AND RECOMMENDATIONS

### CHAPTER 9 CONCLUSIONS

#### The challenge of impact assessment

This study set out to investigate the nature of the impact of international wildlife trade controls, and particularly CITES, on rural livelihoods. Information on the importance of the use and trade of wild species to local livelihoods was collected, and the hypothesis that international wildlife trade regulations could have a significant negative impact on local livelihoods while achieving doubtful conservation benefits examined. Finally, this study sought to identify possible mechanisms to achieve the biodiversity conservation goals of such trade controls while minimising the negative impacts that they might have on the livelihoods of poorer groups.

The literature review undertaken for this study demonstrated that documentation of the local significance of international trade in wild species is poor, often anecdotal and generally extremely site-specific. This is especially true for wild species covered by CITES, as these species are frequently not widespread, abundant and/or highly used relative to many other wild species of commercial value (e.g. rattans, palms) and therefore are poorly studied from a socio-economic standpoint.

The *impacts* of related international trade measures are even less well-documented. Where studies have occurred, they have tended to focus on conservation impacts although even here, there is not a wealth of information. Although there would appear to be general agreement that CITES has reduced the threat to wild species posed by international trade, as indicated in the preceding section, there have been no detailed studies of the conditions under which this is the case. The fact that populations of some species have continued to decline despite being listed in CITES Appendix I is often highlighted in arguments that CITES does not work. What is not known, however, is what would have happened to these species if they had not been listed, and one or more range States had allowed exports. The same question could be posed with regard to the status of many CITES Appendix II species had there not been CITES trade controls in place.

Little or no attention has been paid to the socio-economic effects of regulations affecting international wildlife trade – particularly at the local level. Some information is available regarding the impacts of the CITES Appendix I listing on the export of African Elephant products, especially from southern Africa (Zimbabwe in particular), and on the impacts of import bans on marine mammal products (especially seal skins). In the case of seal products, the most significant import restrictions were taken unilaterally or regionally (European Union), not under an international agreement, and reflect a response to animal welfare as well as conservation concerns. Furthermore, the livelihood impacts appear to be related more to a change in markets as a result of campaigning than to a change in trade controls.

Much of the discourse around the issues of wildlife trade and livelihoods concerns apparently 'unnecessary' restrictions on the trade in what some argue are abundant – or at least not threatened – species. What is generally overlooked, but potentially more significant given the number of species involved, is the livelihood impact of declining availability of wild populations of species that are important for subsistence use or income generation. In this case, the negative impact on rural livelihoods could stem from *too little* trade control, not too much, especially in cases where local efforts to manage a resource sustainably and for local benefit are being undermined by external access or illegal extraction for foreign markets. This can be argued for many coastal fisheries, for example.

The task of assessing livelihood impacts is complicated further by the difficulty in teasing apart the effects of internationally agreed and imposed trade measures such as CITES and domestic measures regulating access to resources,

resource use and trade. The latter measures may have been in place prior to any CITES listing coming into effect, and/or be a response to CITES processes. National or local level legislation may not be trade specific (e.g., access restrictions associated with state-owned land such as protected areas, harvest bans, licence and permit requirements, etc.) but nevertheless have a major impact on trade volumes and associated livelihood opportunities. Furthermore, some impacts may occur immediately and be severe, but be of short-term duration; others may not be so acutely felt in the short-term, or not felt at all, but have a significant long-term effect.

Yet another complicating factor is assessing the effects of regulations versus those associated with a **shift in demand**. Such shifts can be a result of changing fashions, for example a recent increase in demand for medicinal plants in response to the growing herbal products sector, or reflect negative consumer campaigns such as those that have taken place in Europe and North America around the trade in ivory, furs and wild birds. CITES can and has provided a forum around which to focus (and debate) such campaigns. The inter-relationships between markets and regulatory processes go further, with markets potentially shifting in response to perceived threats to future access to resources brought about by CITES listing proposals with demand – and prices – increasing or decreasing as a result of perceived 'rarity'.

Finally, though not least importantly, is the problem of assessing whether and when increased commercialisation of wildlife resources, including through international trade, results in a positive, negative or mixed impact on rural livelihoods. Debates are ongoing regarding how best to increase income generating opportunities and activities based on natural resource extraction without threatening biodiversity, and what types of activities are most likely to benefit which sectors of society.

With the lack of information noted above, and the jury still out on the benefits of increased commercialisation of wild products and how best to achieve them, it is difficult to arrive at many general conclusions regarding the livelihood impacts of increased international wildlife trade controls. Perhaps the main conclusion is 'it depends'. With this in mind, the following are some of the main findings and recommendations resulting from the literature review and case study conducted in Tanzania. The findings and recommendations focus on CITES as the main regulatory instrument governing international trade in wildlife. However, many are equally applicable to domestic measures.

#### **Characteristics of the trade in CITES-listed species**

- Most CITES-listed species in trade have local uses as well as foreign markets; local uses and domestic trade predominate in many cases.
- Most of the species covered by CITES are not traded internationally in large quantities compared to the trade in other wildlife products (e.g. brazil nuts, timber, marine fish). Important exceptions include the trade in numerous ornamental and medicinal plants and some reptile species traded as skins or live specimens.
- As a consequence of the above factors, a relatively small number of people are involved in the harvest or collection of CITES-listed species for export compared to those involved in some form of wildlife harvest overall, although this would not be the case if the CITES appendices were expanded to include a greater number of commercial timber, fish and medicinal plant species.
- Wildlife harvests for international trade rarely provide the sole source of income, but often form an important element of a wider agriculture-based livelihood strategy.

- Harvest may involve people living local to the species or people travelling to areas for the specific purpose of harvest. This dynamic may shift with changes in the structure of markets.
- The international wildlife trade generally has several tiers from harvest to export, and only a very small share of the income resulting from export of wildlife products to international markets is realised by collectors. Nevertheless, this income can be an important contribution to rural livelihoods, especially in terms of increased security at critical times of the year.
- Depending on the management structures, wildlife harvests for trade can make important livelihood contributions at the community as well as individual/household level.
- The elasticity of markets for CITES-listed species reflects the use to which those species are put, access to acceptable substitutes, and the access and sensitivity of consumers to conservation, animal welfare and development messages. Thus far conservation and animal welfare concerns related to the wildlife trade have received far more attention in the western media than development concerns, with a decline in markets for wildlife products being a typical response to such messages.
- Markets for CITES-listed species may be impacted by discussions undertaken within and around CITES fora, as well as by the decisions themselves. Markets may increase or decrease in anticipation of a restriction on future supplies. The consequent impact on harvester livelihoods and wildlife populations may be independent of any actual change to trade controls.
- Captive breeding, cultivation, artificial propagation and other forms of intensive *ex situ* management are increasingly augmenting or replacing production of CITES-listed species via wild harvest. Under present conditions, beneficiaries of such intensive management regimes are unlikely to be the same individuals or communities involved in wild-harvest, although such activities may generate employment opportunities and/or increased agricultural income. Enrichment schemes, e.g. enrichment planting and ranching, are more likely to maintain or increase local benefits.

#### **Characteristics of CITES decision-making processes and related trade controls**

- CITES was established to address the conservation of wild species in international trade, not the livelihoods of people dependent on that trade. Nevertheless, CITES recognises the economic and other values of wildlife in its preamble, and increased recognition has been given in the last decade to the benefits wildlife trade can provide to the development of local people.
- Criteria for listing species in the CITES appendices are based on biological and trade factors; livelihood considerations are not included in the listing criteria. However, CITES decisions are highly politicised and may or may not reflect these concerns. Livelihood issues are similarly not taken into account in selecting species for significant trade reviews.
- Other than as represented by their governments, livelihood issues and the concerns of the rural poor are rarely voiced at CITES meetings. In contrast, conservation and animal welfare organisations and industry are well-represented.

- The implementation of CITES listings depends on the actions of individual range and consumer State governments, and is highly variable. The livelihood impacts of national level harvest and trade controls often exceed those of CITES implementation. However CITES-related species-specific or comprehensive trade bans can have significant and rapid livelihood impacts.
- Every Party has equal voting rights under CITES but some countries, by virtue of being able to afford greater representation, have a louder 'voice' than others.
- In general, CITES listing decisions are applied to all range States equally, rather than taking account of differences in the status and management of species within individual range States. This practice is shifting, however, with 'split listings' increasingly being applied to allow trade from range States demonstrating sustainable management.
- The fact that decisions to increase harvest and/or trade controls are generally taken without a clear understanding of local realities and/or the participation of local stakeholders means that such decisions are often poorly understood and/or contested at the local level, and therefore often unsuccessful.
- Stricter domestic measures applied by some Parties outside of the CITES process can be perceived as undermining the international agreements reached within CITES fora.
- CITES can help to increase national government control over international trade as well as the overall transparency of that trade.
- In cases where CITES-listed species are declining in the wild owing to overexploitation for export, CITES processes frequently help to slow those declines; this can provide a window in which sustainable management regimes can be developed.
- Historically, 'high profile' species (e.g. charismatic mammals, parrots, ornamental plants) tended to dominate the proposals for CITES listings. This is changing, however, with an increasing effort to list timber and other plant species, fish and invertebrates.

#### **Do international trade controls result in a lose-lose scenario for biodiversity and livelihoods?**

The previous sections illustrate the impossibility of providing a universal answer to this question. From the literature reviewed and the case study conducted in Tanzania, it is apparent that conservation-motivated international trade controls, and specifically those required under CITES, usually do not result in a lose-lose scenario for a number of reasons:

- While trade bans may not always be an effective conservation mechanisms, in general, different forms of trade control have had a positive, or at least not a negative, impact on species conservation.
- The commercial export of wildlife products is often one of a variety of competing uses for wild species at the local level, and not necessarily the use that makes the greatest contribution to rural livelihoods given current trade structures.
- For many wild species, the impacts of national level restrictions on resource access or trade can be far more significant than international trade controls; international trade controls may increase the effectiveness of such national level restrictions, however, e.g. by reducing the potential for illegal exports.



- International wildlife trade restrictions are increasing in variety and flexibility, with expanding emphasis being given to livelihood concerns during debates in CITES.

Furthermore, in some cases, the *absence* of trade controls can result in a lose-lose scenario since over-harvest can have livelihood impacts in the form of a lack of resources for subsistence needs or further trade. Nevertheless, there are examples where international trade controls have reduced the income available to rural communities without bringing about any obvious conservation benefit. Such controls are likely to further undermine future efforts to improve local benefits from wild species through community-based management of wildlife resources.

Integrating conservation and development through any mechanism requires a series of tradeoffs – the pursuit of a pure win-win scenario is likely to be a futile one (see for example the vast literature on the experience of integrated conservation and development projects (ICDPs) reviewed in Hughes and Flintan 2001). The final chapter of this report provides recommendations for applying conservation-motivated wildlife trade controls in a manner that increases the chance for the simultaneous conservation of species in trade and the contribution of those species to the livelihoods of the rural poor.

Much of the debate to date with regard to the impact of CITES and other international trade controls on rural livelihoods has surrounded the negative implications of limiting access to markets. However, discussion is increasing regarding the potential for CITES to be used as a tool to increase the livelihood contributions associated with trade in wild species. This reflects the evolution in thinking that has taken place between the agreement of CITES in 1973 and the Convention on Biological Diversity (CBD) nearly 20 years later, in 1992.

### Synergies with the CBD

Although CITES and the CBD have a different emphasis and scope, they also have much in common and do not conflict in most of their basic premises: that wild species are important to development, when used, should be used sustainably, are best conserved at the local and national level, and international co-operation is required in this regard. Key areas of disagreement regard sovereignty of rights over biological resources and specifically the treatment of genetic resources.

On the first issue, the CBD 'reaffirms' "that States "have sovereign rights over their own biological resources", while CITES "recognises that peoples and States are and should be the best protectors of their own wild fauna and flora". By being a Party to CITES, States have, it can be argued, subjugated this sovereign right to a collective decision-making process in the case of exports of CITES-listed species. Although range States must be consulted in the process of submitting CITES listing proposals and have a vote when they are considered, they cannot prevent such proposals from being agreed over their objections. They can, however, opt out of implementing those listings to which they object up until such time as they go into effect (i.e., take a 'reservation'). However, such reservations only allow trade with non-Parties and other Parties that have similarly taken such a reservation. With over 150 countries now Party to CITES, and most loath to take reservations, this option is unlikely to prove viable in most cases.

On the second issue, there is no restriction within CITES on the export of reproductively fit specimens. In fact, CITES listings for plant species generally exempt seeds and tissue cultures, i.e. genetic resources, as the trade therein is generally considered unlikely to be detrimental to the species' wild population. The trade in animals and products produced as a result of captive breeding are similarly subject to less scrutiny in the CITES process, the main criteria being that the breeding operations are established and maintained in a manner not detrimental to the survival of the species in the wild. Exports of captive-bred specimens from countries other than the country of origin of the species in trade may be subject to less scrutiny than exports from range States, as there may be a perceived lower risk of misdeclaration of wild specimens as captive-bred. By contrast, the CBD predicates such trade on "the fair and equitable sharing of benefits arising out of the use of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies...".

More fundamentally, however, CITES is essentially a conservation convention, while the CBD is concerned with the much broader goal of sustainable development. Under CITES, proposals to list species have to be accompanied by a supporting statement that considers the conservation status of the species in question, levels of utilisation and trade and existing management and control mechanisms (Resolution Conf 9.24). No information is required – even within the section on utilisation and trade – regarding the socio-economic significance of continuing trade, or to determine potential secondary conservation effects resulting from changes in socio-economic status if regulation is increased. Furthermore, Parties are urged to adopt the precautionary principle in cases of uncertainty and base decisions on the interests of conservation. These provisions clearly put conservation over and above socio-economic interests - a position that is diametrically opposed to the CBD's recognition in its preamble that economic and social development and poverty eradication are the priorities of developing countries.

The difference between the Conventions is not surprising considering the paradigm shifts in conservation and development thinking that have occurred since CITES was conceived. If it were to be formulated today, in the year of the World Summit on Sustainable Development, CITES would doubtless look considerably different. Yet the Convention as it stands has some valuable mechanisms in place that could be adapted to take into account socio-economic issues and enable CITES to more effectively contribute to sustainable development.

### **Applying lessons learned from other sectors**

As this study has shown, international trade controls are only one of a myriad of factors influencing the contribution that wild species make to rural livelihoods, and CITES-listed species only a fraction of the species used by rural inhabitants. While it is important to consider how such trade controls can be structured in order to achieve conservation and development objectives, it is even more important not to lose sight of the wider set of conditions influencing the utilisation and conservation of wildlife resources. This includes local and national governance structures affecting access to wildlife resources as well as market characteristics. It is often these, rather than the presence or absence of trade barriers, that will determine whether a resource is used sustainably and makes a positive contribution to rural livelihoods. With this in mind, it is critical that those concerned with conservation and livelihoods look beyond regulations to wider questions of incentives, and how these can be shaped to support conservation and development.

A great deal of work is being done with regard to increasing the contribution of the trade in NTFPs to rural development, with questions of conservation and livelihoods being addressed simultaneously. Much of this work is taking place as a part of rural development projects, with the lessons learned rarely finding their way into discussions in conservation fora such as CITES. It is essential that the expanding knowledge about conditions influencing the biological and socio-economic characteristics of the trade in NTFPs is applied to decision making in the context of the 'wildlife trade', which thus far has been viewed as a separate issue in international policy discussions.

An increasing emphasis is being placed on increasing producer incentives and consumer demand for products meeting these two objectives. Third-party (independent) certification and labelling are currently being promoted in this regard, e.g. by the Forest Stewardship Council (FSC) with regard to timber, and more recently NTFPs. Challenges with implementation of certification schemes thus far include ensuring that certified wood is price-competitive and addressing constraints including high costs associated with the certification process (particularly to community groups) and the inability of standards to recognise the complexity of local land use systems and relevant social issues (Bass *et al.* 2001).

Some have argued that CITES is already in effect a certification system, as exporting governments are required to make "non-detriment findings" before allowing exports, i.e., to certify that exports are sustainable. Several labelling schemes are already in existence under CITES - for example, for crocodile skins and Vicuña cloth. However, unlike under systems such as FSC, CITES does not automatically include a process of third-party certification (although the significant trade process does offer the possibility to examine claims to this effect), and only ecological, as opposed to sociological, parameters are considered. Relevant FSC principles include: Principle 3 on Indigenous Peoples' Rights, which states that "the legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognised and respected"; and Principle 5 on Benefits from the Forest which requires that "Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits" (FSC 2000). Expanding the scope of CITES procedures in the spirit of such FSC Principles, for example to assess whether proposed trade controls would have a negative socio-economic impact as well as whether trade would have negative ecological consequences, could help CITES make a more positive contribution to sustainable rural livelihoods as well as conservation.

## Recommendations

Realising the full potential of CITES as a tool for securing both livelihood and conservation objectives requires actions on a number of fronts:

1. Sensitising the 'CITES community' and consumers to the livelihood issues associated with the international wildlife trade, and the 'development community', traders and consumers to the application of CITES. A key message with regard to the latter is that the listing of a species in CITES Appendix II is not an indication that a species is necessarily threatened with extinction nor does it ban commercial trade.
2. Modifying CITES decision-making processes to include consideration of livelihood issues by including information on the socio-economic aspects of harvests and trade in significant trade reviews and the supporting statements of CITES-listing proposals, and considering that information when designing and recommending remedial measures, including:
  - increasing attention to the socio-economic dimensions of the wildlife trade within discussions during meetings of the Conference of the Parties and work programmes under the Animals and Plants Committees;
  - increasing the voice of rural communities engaged in harvest of CITES-listed species within CITES decision-making processes; and
  - broadening the application of the precautionary principle within CITES to take socio-economic factors into account in decision-making.
3. Avoiding blanket trade bans without first taking into account the status of national level populations and management regimes. The Conference of the Parties could also encourage individual Parties to adopt management processes that give preferential access to markets to communities that can demonstrate sustainable harvesting practices.
4. Expanding the linkages between implementation of CITES and the CBD by:
  - increasing the attention paid to wildlife trade issues within CBD policy discussions and work programmes, including within the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), and within national biodiversity action plans developed under the CBD;
  - developing national trade controls and reporting mechanisms that support both CITES and CBD objectives;
  - using CITES to support the CBD through increasing the transparency of the international trade in biodiversity, including the products resulting from the use of genetic resources, and to prevent unsanctioned export of genetic resources; and
  - where appropriate to meeting conservation and livelihood objectives, increasing capacity for intensive management to increase production (e.g. ranching, enrichment planting, captive breeding, cultivation, etc.) within range States, and encouraging technology transfer among range States and from consumer countries to range States in this regard. Favouring commercial captive-breeding schemes in range States would help ensure that the benefits of trade in captive-bred species are retained in the country of origin.
5. Ensuring that learning resulting from research on community-based wildlife management and NTFP development is brought into and informs discussions of and decisions taken regarding the international wildlife trade in order to increase the potential for achieving conservation and development aims.
6. Examining the potential for synergy between CITES and voluntary certification and labelling schemes.

7. Acknowledging that different stakeholder groups have different perceptions of the values of natural resources, that different priorities may have equal validity and that effective management needs to reconcile these perceptions and priorities.

**Reconciling different world views on biodiversity values**

Views and perspectives regarding the importance of natural resources vary significantly amongst different stakeholders. In particular, there is often a strong polarisation of views between communities living within or adjacent to areas rich in wildlife resources, governments and conservation organisations (Hall and Rodgers, 1992; Arnold, 1995). In the East Usambara Mountains for example, at least four different stakeholders can be identified in relation to wildlife and forest resources: local communities, government offices and staff, the private sector and the international conservation community (Kessy, 1998). Due to differing value systems associated with customary, social and professional ethics and ways of life, each group ranks the importance of wildlife resources and the impact of regulation differently. For effective management, these differing perceptions need to be reconciled, and global and local interests balanced.

**Examples of values of wildlife resources in the East Usambara Mountains according to different stakeholders**

Stakeholder group	Values of wildlife resources
Local communities:	Water, timber, fuel, food, medicines, non-timber forest products for subsistence use; land, local climate, small-scale commerce, culture base, tourism.
Private sector:	Local climate, water catchment, soil conservation, industrial raw materials, timber.
National government:	Water catchment, regional climatic patterns, power, urban market demands, tourism, export revenues.
International community: (including traders)	Rare and unique biodiversity, research and scientific potential, genetic resource, international market demands.

**Further research requirements**

This study highlighted a clear lack of information about the significance of international trade in wildlife to sustainable rural livelihoods and the difficulties of predicting potential, or assessing actual, impacts of international wildlife trade controls at the local level. Throughout this report we have flagged key research needs in order to address this knowledge gap. These are summarised below:

1. Detailed case studies to determine the significance of wildlife trade to rural livelihoods compared to other uses of wildlife.
2. Supply chain analysis to determine where gains and losses are made for different commodities and how supply chains might be modified to be more pro-poor.
3. In order to explore the governance issues associated with the CITES decision making process, a systematic evaluation of proposals submitted over time.
4. Case studies including livelihood impact analysis of trade regulations and the livelihood diversification strategies adopted by people confronted with trade restrictions including a comparative analysis of differential impacts along the supply chain.

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**ANNEX I**

**Examples of wildlife product exports (not including timber or fisheries) from non-OECD countries.**

Country of export	LDC <sup>1</sup> , DFID priority countries <sup>2</sup> , or High biodiversity?	Major NWFPs in commercial trade as identified by FAO <sup>3</sup>	Examples of CITES specimens exported during the 1980s and 1990s
Afghanistan	LDC, High biodiversity	Pine nuts, walnuts, moneks, liquorice	
Argentina	High biodiversity	Medicinal plants, vegetable tannins	Mammal skins including Culpeo and zorro's <i>Pseudalopex</i> spp., Geoffroy's Cat <i>Felis geoffroyi</i> , Collared Peccary <i>Pecari tajacu</i> , Guanaco <i>Lama guanicoe</i> and Patagonian Hog-nosed Skunk <i>Conopatus humboldtii</i> ; Parrots, e.g. Blue-fronted Amazon <i>Amazona aestiva</i> ; Rhea <i>Rhea americana</i> skins; Tegú lizard <i>Tupinambus</i> spp. skins; Boa <i>Boa constrictor</i> and Yellow Anaconda <i>Eunectes notatus</i> skins
Bahrain			Queen Conch <i>Strombus gigas</i> meat, live, shells
Bangladesh	LDC, DFID priority, High biodiversity	Bamboo	Monitor, e.g. <i>Varanus bengalensis</i> skins; Rat Snake <i>Ptyas mucrosus</i> skins; freshwater turtles, e.g. Spotted Playshell Turtle <i>Isisemys punctata</i> ; Indian Bullfrog <i>Heplahtrachus tigrinus</i> legs (meat)
Belize	High biodiversity		Queen Conch <i>Strombus gigas</i> meat, live, shells; orchids Orchidaceae spp.
Benin	LDC, High biodiversity	Shea nuts	Tortoises, e.g. Leopard Tortoise <i>Geochelone pardalis</i> ; Emperor Scorpions <i>Pandanus imperator</i>
Bolivia	High biodiversity	Brazil nuts	Geoffroy's Cat <i>Felis geoffroyi</i> and Ocelot <i>Felis pardalis</i> skins; parrots; Spectacled Caiman <i>Caiman crocodylus</i> skins; Tegú lizard <i>Tupinambus</i> spp. skins; Yellow Anaconda <i>Eunectes notatus</i> skins
Botswana	High biodiversity		African Elephant <i>Loxodonta africana</i> ivory; Hippopotamus <i>Hippopotamus amphibius</i> teeth/tusks, skins; Trophies, e.g. Lion <i>Panthera leo</i> , Lechwe <i>Kobus lechwe</i> , Nile Crocodile <i>Crocodilus niloticus</i> skins
Brazil	High biodiversity	Brazil nuts, caputo, silk, essential oils <sup>4</sup> , beeswax <sup>4</sup> , vegetable tannins	Yacare Caiman <i>Caiman yacare</i> skins; Tegú lizard <i>Tupinambus</i> spp. skins; Arapaima <i>Arapaima gigas</i> meat; orchids Orchidaceae spp.; tree ferns <i>Dicksonia sellowiana</i> ; cacti Cactaceae spp.
Burkina Faso	LDC	Shea nuts	
Burundi	LDC, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory
Cameroon	High biodiversity		African Elephant <i>Loxodonta africana</i> ivory; parrots, e.g. African Grey Parrot <i>Psittacus erithacus</i> ; live reptiles e.g. Four-horned Chameleon <i>Chamaeleo quadricornis</i> ; Nile Monitor <i>Varanus niloticus</i> skins; <i>Prunus africana</i> bark, extract; African Mosia <i>Pericopsis elata</i> timber
Central African Republic	LDC, High biodiversity	Shea nuts	African Elephant <i>Loxodonta africana</i> ivory
Chad	LDC, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory; Nile Monitor <i>Varanus niloticus</i> skins
Chile	High biodiversity	Pine mushrooms, medicinal plants	Grey Fox <i>Pseudalopex griseus</i> skins; cacti (rainsticks); Alerce <i>Fitzroya cupressoides</i> and <i>Pilgerodendron uljofskii</i> timber

Country of export	LDC, DFID priority countries, or High biodiversity?	Major NWFPs in commercial trade as identified by FAO <sup>1</sup>	Examples of CITES specimens exported during the 1980s and 1990s
China	DFID priority, High biodiversity	Pine nuts, bamboo shoots, gum rosin, rattan, bamboo, honey*, beeswax*, silk, liquorice, ginseng, essential oils*, medicinal plants, cassia	Cat skins, e.g. Leopard Cat <i>Prionailurus bengalensis</i> , Eurasian Lynx <i>Lynx lynx</i> , medicines containing rhinoceros horn, Tiger <i>Panthera tigris</i> bone, musk deer <i>Moschus</i> spp., bear <i>Ursus</i> spp. and other animal products; Rat Snake <i>Phyas mucosus</i> skins; Black Coral <i>Antipathera</i> spp.; medicinal plants, e.g. rhizomes of the orchids <i>Bletilla striata</i> and <i>Cibotium barometz</i> ; other orchids <i>Ochridaceae</i> spp.
Colombia	High biodiversity		Reptile skins, e.g. of Spectacled Caiman <i>Crocodilus</i> and Tegu lizard <i>Tupiaimbatus</i> spp. skins; Iguanas <i>Iguana iguana</i> ; Arapaimas <i>Arapaima gigas</i> Queen Conch <i>Strombus gigas</i> meat
Congo	High biodiversity		African Elephant <i>Loxodonta africana</i> ivory
Cote d'Ivoire	High biodiversity	Shea nuts	
Democratic Republic of the Congo	LDC, High biodiversity	Medicinal plants	African Elephant <i>Loxodonta africana</i> ivory; Hippopotamus <i>Hippopotamus amphibius</i> teeth/tusks; African Grey Parrots <i>Psittacus erithacus</i> ; Leopard Tortoises <i>Geochelone pardalis</i> ; <i>Prunus africana</i> bark; Afroirmosia <i>Pericopsis elata</i> timber
Djibouti	LDC		African Elephant <i>Loxodonta africana</i> ivory
Dominican Republic	High biodiversity		Queen Conch <i>Strombus gigas</i> meat; Cacti <i>Cactaceae</i> spp.
Ecuador	High biodiversity		Poison frogs, e.g. Harlequin Poison Frogs <i>Dendrobates luteiventris</i> and Phantasmal Poison Frogs <i>Epipedobates tricolor</i>
El Salvador	High biodiversity		Iguanas <i>Iguana iguana</i>
Egypt	High biodiversity		Tortoises, e.g. Common Tortoises <i>Testudo graeca</i> ; Egyptian Mastigures <i>Uromastix aegyptia</i>
Ethiopia	LDC, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory
Fiji	High biodiversity		Giant Clams <i>Tridacnidae</i> spp. live, shells; stony corals <i>Scleractinia</i> spp.
Gabon	High biodiversity		African Elephant <i>Loxodonta africana</i> ivory
Georgia			Snowdrops <i>Gallanthus</i> spp. bulbs
Ghana	DFID priority, High biodiversity	Shea nuts	African Grey Parrots <i>Psittacus erithacus</i> ; African Python <i>Python sebae</i> skins; Royal Pythons <i>P. regius</i> ; Emperor Scorpions <i>Pandanus imperator</i> ; Afroirmosia <i>Pericopsis elata</i> timber
Grenada	High biodiversity	Nutmeg, mace	
Guinea	LDC, High biodiversity	Shea nuts	Parrots, e.g. Senegal Parrots <i>Psittacus senegalus</i> ; African Python <i>Python sebae</i> skins
Guatemala	High biodiversity		Iguanas <i>Iguana iguana</i> ; orchids <i>Orchidaceae</i> spp.
Guyana	DFID priority, High biodiversity		Common Squirrel Monkeys <i>Saimiri sciureus</i> ; parrots, e.g. Orange-winged Parrot <i>Amazilia amazilia</i> ; Toucans, e.g. Channel-billed Toucan <i>Ramphastos vitellinus</i> ; Iguanas <i>Iguana iguana</i> ; tortoises e.g. Brazilian Giant Tortoise <i>Geochelone dentiflora</i> ; Spectacled Caiman <i>Caiman crocodyllus</i> skins

Country of export	LDC, DFID priority countries, or High biodiversity?	Major NWFPs in commercial trade as identified by FAO	Examples of CITES specimens exported during the 1980s and 1990s
Haiti	LDC, High biodiversity		Queen Conch <i>Strombus gigas</i> meat, live, shells
Honduras	High biodiversity		Parrots, e.g. Yellow-naped Amazon <i>Amazona aureocephala</i> ; Spectacled Caiman <i>Caiman crocodilus</i> skin; Jaguar <i>Panthera tigris</i> ; Queen Conch <i>Strombus gigas</i> meat, live, shells
Hungary			Bulbs, e.g. snowdrops <i>Galanthus</i> spp., cyclamens <i>Cyclamen purpuraceum</i>
India	DFID priority, High biodiversity	Walnuts, morels, gum karaya, lac, silk, essential oils <sup>2</sup> , medicinal plants, bidi leaves, cassia	Rat Snake <i>Ptyas mucosus</i> skins; Indian Bullfrog <i>Hoplobatrachus tigerinus</i> (meat); medicinal plants, e.g. Agarwood <i>Aquilaria malaccensis</i> , <i>Kanavoffia serpentina</i> Red Sanders <i>Pterocarpus santalinus</i> ; orchids Orchidaceae spp.
Indonesia	DFID priority, High biodiversity	Sago, gum rosin, rattan, bamboo, bamboo shoots, essential oils <sup>2</sup> , cassia, illipe nuts, nutmeg, kapok, gutta percha(latex)	Macaques, e.g. Long-tailed Macaques <i>Macaca fascicularis</i> ; Pangolin <i>Manis javanica</i> skins; parrots, e.g. <i>Cacatua</i> spp.; reptile skins, e.g. New Guinea Crocodile <i>Crocodylus novaeguineae</i> ; Common Water Monitor <i>Varanus salvator</i> ; Blood Python <i>Python curtus</i> ; Rat Snake <i>Ptyas mucosus</i> ; live reptiles, e.g. Celebes Tortoise <i>Indotestudo forsterii</i> ; Asian Arowanas <i>Scleropages formosus</i> ; Birdwing butterflies <i>Ornithoptera</i> spp.; Stony Corals <i>Scleractinia</i> spp.; Agarwood <i>Aquilaria malaccensis</i> ; Tree Ferns
Iran	High biodiversity	Liquorice, gum tragacanth	Caviar <i>Acipenseriformes</i> spp.
Jamaica	High biodiversity		Queen Conch <i>Strombus gigas</i> meat
Kenya	DFID priority, High biodiversity	Amatto	African Elephant <i>Loxodonta africana</i> ivory; Green Monkeys <i>Chlorocebus aethiops</i> ; Baboons <i>Papio hamadryas anubis</i> ; Nile Crocodile <i>Crocodylus niloticus</i> skins; <i>Prunus africana</i> bark
Laos, PDR	LDC		Pangolin <i>Manis</i> spp. skins
Liberia	LDC, High biodiversity		African Grey Parrot <i>Psittacus erithacus</i>
Madagascar	LDC, High biodiversity	Cinnamon	Parrots, e.g. Grey-headed Lovebirds <i>Agapornis canus</i> ; Nile Crocodile <i>Crocodylus niloticus</i> skins; Live reptiles e.g. chameleons <i>Furcifer</i> spp.; amphibians, e.g. Golden Mantellas <i>Mantella aurantiaca</i> ; <i>Prunus africana</i> extract; orchids Orchidaceae spp.; succulents e.g. <i>Pachypodium</i> spp., <i>Euphorbia</i> spp.
Malaysia	High biodiversity	Sago, birds nests, rattan, bamboo, gutta percha(latex)	Pangolin <i>Manis</i> spp. skins; Blue-crowned Hanging Parrot <i>Loriculus galgulus</i> ; Reticulated Python <i>Python reticulatus</i> skins; tortoises, e.g. Blongated Tortoise <i>Indotestudo elongata</i> ; Birdwing butterflies, e.g. <i>Troganoptera braconiana</i> ; Agarwood <i>Aquilaria malaccensis</i> ; orchids Orchidaceae spp.; <i>Cyathea</i> spp.
Malawi	LDC, DFID priority, High biodiversity		Hippopotamus <i>Hippopotamus amphibius</i> teeth/husks
Mali	LDC, High biodiversity	Shea nuts, copalatum gum	Parrots, e.g. Brown-necked Parrot <i>Poicephalus robustus</i> ; African Spurred Tortoise <i>Gerrhonotus salicaria</i> ; monitor skins e.g. <i>Varanus niloticus</i> ; African Python <i>Python sebae</i> skins
Mexico	High biodiversity		Cacti Cactaceae spp., orchids Orchidaceae spp.
Mongolia	High biodiversity		Pallas' Cat <i>Felis mamm</i> skins
Morocco	High biodiversity	Cork, beeswax*	
Mozambique	LDC, DFID priority, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory; Tortoises, e.g. Leopard Tortoise <i>Geochelone pardalis</i> ; Nile Crocodile <i>Crocodylus niloticus</i> skins; giant clams Tridacnidae spp. shells; stony corals <i>Scleractinia</i> spp.

Country of export	LDC, DFID priority countries, or High biodiversity?	Major NWFPs in commercial trade as identified by FAO	Examples of CITES specimens exported during the 1980s and 1990s
Myanmar	LDC, High biodiversity	Bamboo, rattan	African Elephant <i>Loxodonta africana</i> ivory, trophies; Cape Fur Seal <i>Arctocephalus pusillus</i> skins; urophies e.g. Lions <i>Panthera leo</i> , Chertah <i>Acinonyx jubatus</i>
Namibia	High biodiversity		Rat Snake <i>Ptyas mucronatus</i> skins; Jatamani <i>Nardostachys grandiflora</i>
Nepal	LDC, DFID priority, High biodiversity		Parrots, e.g. White-fronted Parrot <i>Abazona albifrons</i> ; live reptiles, e.g. Iguanas <i>Iguana iguana</i> ; 'poison frogs' e.g. Green-and-black Poison Frog <i>Dendrobates auratus</i> ; Spectacled Caiman <i>Caiman crocodylus</i> skins; Tamarins <i>Brachyteles</i> spp.; orchids Orchidaceae spp.
Nicaragua	High biodiversity		African Savannah Monitor <i>Varanus exanthematicus</i> skins
Nigeria	DFID priority, High biodiversity	Gum arabic, shea nuts, combretum gum	
Pakistan	DFID priority	Pine nuts, walnuts, morels, liquorice	Markhor <i>Capra falconeri</i> trophies
Panama	High biodiversity		Ocelot <i>Felis pardalis</i> skins; Iguanas <i>Iguana iguana</i>
Papua New Guinea	High biodiversity		Crocodile skins, e.g. New Guinea Crocodile <i>Crocodylus novaeguineae</i> ; Birdwing butterflies <i>Oranthis</i> spp.; Giant Clams <i>Tridacnidae</i> spp. meat
Paraguay	High biodiversity		Geoffrey's Cat <i>Felis geoffroyi</i> and Ocelot <i>Felis pardalis</i> skins; Teju lizard <i>Lepidochelys</i> skins; Boa <i>Boa constrictor</i> skins; Yellow Anaconda <i>Funetes nativus</i> skins; Yacare Caiman <i>Caiman yacare</i> skins; orchids Orchidaceae spp; cacti <i>Cactaceae</i> spp.
Pem	High biodiversity	Brazil nuts, annatto, cochineal	Ocelot <i>Felis pardalis</i> skins; Common Squirrel Monkeys <i>Saimiri sciureus</i> ; Peccary <i>Pecari tajacu</i> and <i>Tayassu pecari</i> skins; parrots, e.g. Red-masked Parakeets <i>Aratinga erythrogenys</i> ; hummingbirds, e.g. <i>Amazilia</i> Hummingbird <i>Amazilia amazilia</i> ; Iguanas <i>Iguana iguana</i> ; orchids Orchidaceae spp.
Philippines	High biodiversity	Bamboo, rattan	Long-tailed Macaque <i>Macaca fascicularis</i> ; Pangolin <i>Manis javanica</i> skins, giant clams <i>Tridacnidae</i> spp. live shells; Black coral <i>Antipatharia</i> spp.; Stony Corals <i>Scleractinia</i> spp.; orchids Orchidaceae spp.; Queen Cornh <i>Strombos gigas</i> meal
Saint Vincent and the Grenadines			
Seychelles			
Senegal	High biodiversity	Cinnamon	
Solomon Islands	LDC, High biodiversity		Parrots, e.g. Senegal Parrot <i>Poicephalus senegalus</i> African Python <i>Python sebae</i> skins
Somalia	LDC, High biodiversity		Ducock's Cuckoo <i>Cacatua ducockii</i> ; live reptiles e.g. Prehensile-tailed Skink <i>Corucia zebrata</i> Giant Clams <i>Tridacnidae</i> spp. live; Stony Corals <i>Scleractinia</i> spp.
South Africa	DFID priority, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory
			African Elephant <i>Loxodonta africana</i> ivory, leather, trophies; Cape Fur Seal <i>Arctocephalus pusillus</i> skins; Baboons <i>Papio kankor</i> skins; Leopard, Tortoise <i>Geochelone pardalis</i> ; African Savannah Monitor <i>Varanus exanthematicus</i> skins; Aloe <i>Aloe ferax</i> extract; Cycads <i>Cycadaceae</i> spp.

Country of export	LDC, DFID priority countries, or High biodiversity?	Major NWFPs in commercial trade as identified by FAO	Examples of CITES specimens exported during the 1980s and 1990s
Sri Lanka	High biodiversity	Cinnamon	
Sudan	LDC, High biodiversity	Gum arabic, gum talha	African Elephant <i>Loxodonta africana</i> ivory; Tortoises, e.g. African Spurred Tortoise <i>Geochelone sulcata</i> ; Nile Crocodile <i>Crocodylus niloticus</i> skins; monitor skins e.g. <i>Varanus exanthematicus</i> ; Python snake skins
Suriname	High biodiversity		Parrots, e.g. Orange-winged Parrot <i>Amazona amazonica</i> ; Toucans, e.g. Channel-billed Toucan <i>Ramphastos vitellinus</i> ; Tortoises e.g. Brazilian Giant Tortoise <i>Geochelone dentata</i> ; Iguanas <i>Iguana iguana</i> ; Dyking Poison Frog <i>Dendrobates tinctorius</i> ; orchids Orchidaceae spp.
Tanzania	LDC, DFID priority, High biodiversity	Beeswax*	African Elephant <i>Loxodonta africana</i> ivory; trophies; Green Monkeys <i>Chlorocebus aethiops</i> ; Hippopotamus <i>Hippopotamus amphibius</i> teeth/skins; trophies and skins, e.g. Lion <i>Panthera leo</i> , Baboons <i>Papio hamadryas</i> ; Fischer's Chimbleon <i>Bradypodion fischeri</i> ; Nile Crocodile <i>Crocodylus niloticus</i> skins, live reptiles e.g. Pangolin <i>Manis</i> spp. skins; python, e.g. Burmese Python <i>Python molurus bivittatus</i> skins; Rat Snake <i>Ptyas mucosus</i> skins; live reptiles, e.g. <i>Python molurus bivittatus</i> ; orchids Orchidaceae spp.
Thailand	High biodiversity	Bamboo shoots, bamboo, lac, birks nests, kapok, rattan, gutta percha (latex)	
Tonga	High biodiversity		Giant Clams Tridacnidae spp. live
Togo	LDC, High biodiversity	Shea nut	Parrots, e.g. Jardine's Parrot <i>Polioptila guthriei</i> ; African Python <i>Python sebae</i> skins; tortoises, e.g. Bell's Hinged Tortoise <i>Kinixys belliana</i> ; Royal Python <i>Python regius</i> ; Emperor Scorpions <i>Pandanus imperator</i>
Turkey	High biodiversity	Honey*, beeswax*, gum tragacanth	Common Tortoise <i>Testudo graeca</i> ; Medicinal Leeches <i>Hirudo medicinalis</i> ; bulbs, e.g. snowdrops <i>Gallanthus</i> spp., cyclamens <i>Cyclamen</i> spp.
Turks and Caicos			Queen Conch <i>Strombus gigas</i> meat
Uganda	LDC, DFID priority, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory
Uruguay			South American Fur Seal <i>Arctocephalus australis</i> skins Monk Parakeets <i>Myiopsitta monachus</i> ; Tegu lizard <i>Tiguanus</i> spp. skins
Former USSR	DFID priority (Russia)	Beeswax*, honey*, liquorice	Saiga Antelope <i>Saiga tatarica</i> horn; Common Wolf <i>Canis lupus</i> and Eurasian Lynx <i>Lynx lynx</i> skins; Brown Bear <i>Ursus arctos</i> skins and trophies; musk deer <i>Moschus</i> spp., musk; Horsfield Tortoise <i>Testudo horsfieldii</i> ; Caviar <i>Acipenseriformes</i> spp., Medicinal Leeches <i>Hirudo medicinalis</i> ; Bulbs, e.g. <i>Gallanthus ibarica</i>
Venezuela	High biodiversity		Speckled Caiman <i>Caiman crocodilus</i> skins
Vietnam	High biodiversity	Rattan, cassia	Pangolin <i>Manis</i> spp. skins; parrots, e.g. Moustached Parakeet <i>Ptilinopus alexandri</i> Burmese Python <i>Python molurus bivittatus</i> live and skins; Indian Bullfrog <i>Hoplodactylus nigripes</i> legs (meat); Medicinal plants, e.g. rhizomes of <i>Cibotium barometz</i>

Country of export	LDC, DFID priority countries, or High biodiversity?	Major NWFPs in commercial trade as identified by FAO	Examples of CITES specimens exported during the 1980s and 1990s
Zambia	LDC, DFID priority, High biodiversity		African Elephant <i>Loxodonta africana</i> ivory; Hippopotamus <i>Hippopotamus amphibius</i> teeth/tusks, trophies; African Elephant <i>Loxodonta africana</i> ivory, hide, trophies, e.g. Lion <i>Panthera leo</i> , Lechwe <i>Kobus lechwe</i> ; Leopard Tortoises <i>Geochelone pardalis</i>
Zimbabwe	High biodiversity		African Elephant <i>Loxodonta africana</i> ivory, hides, trophies; Trophies, e.g. Lion <i>Panthera leo</i> , Cheetah <i>Acinonyx jubatus</i> , Baboons <i>Papio hamadryas</i> ; Hippopotamus <i>Hippopotamus amphibius</i> teeth/tusks, skins, trophies; Nile Crocodile <i>Crocodilus niloticus</i> skins

**Notes and Definitions:**

<sup>1</sup>LDC - included in the United Nations Commission on Trade and Development (UNCTAD) list of 49 Least Developed Countries.

<sup>2</sup>DFID priority: Among the top 20 recipients of aid, excluding humanitarian assistance, 2009/2011 (DFID 2001).

<sup>3</sup>High biodiversity - Countries including land areas identified in WWF 'Global 200' Ecoregions and/or Conservation International 'hotspots'.

<sup>4</sup>Iqbal 1995. Trade statistics do not separate wild honey, beeswax or essential oils from cultured or cultivated sources.

**Other publications in the Biodiversity and Livelihoods Issues series:**

Koziell, I. (2001). *Diversity Not Adversity: Sustaining Livelihoods with Biodiversity*

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The Biodiversity and Livelihoods Group of IIED aims to develop and promote tools, processes and institutions to create positive synergies between biodiversity conservation and development. The work focuses in particular on improving the integration of biodiversity and livelihoods policies and understanding the value of biodiversity to different groups.

The Group also aims to strengthen the ability of marginalised groups to realise the full spectrum of values of biodiversity. BLG undertakes policy research, capacity strengthening and awareness raising activities, working with other programmes at IIED and with a range of Southern and international organizations.

**TRAFFIC**, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. The organization is co-ordinated by TRAFFIC International in Cambridge, UK, with staff based in 22 countries and research in dozens of others. TRAFFIC recognizes the diversity of cultural perspectives related to the use of wildlife and collaborates with a wide range of other partners, many governments and other organizations.

The Department for International Development of the United Kingdom (**DFID**) supports policies, programmes and projects to promote international development. DFID provided funds for this study as part of that objective, but the views and opinions expressed are those of the authors alone and do not necessarily reflect the views of DFID, IIED or TRAFFIC.

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