ECONOMIC RELEVANCE OF FARM WILDLIFE IN ENHANCEMENT OF INCOME

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ABSTRACT: The value of wildlife has been widely ignored or under-rated in the past by the international community. At most, wildlife was considered from the limited aesthetic and touristic aspects. This situation has changed somewhat. In the majority of the veterinary profession, which is largely livestock-oriented, wildlife is increasingly considered in terms of wild animal production and occupies just as relevant a position as domestic animal production. Some economists are now trying to quantify the informal nature of a large portion of the wildlife sector. The importance of wildlife to local communities is now globally recognised in community-based or participatory natural resources management programmes. The authors highlight not only the economic importance of wildlife (which amounts to billions of United States dollars world-wide), through consumptive and non-consumptive uses, but also the present and potential nutritional value, the ecological role as well as the socio-cultural significance of wildlife for human societies of both the developed and the developing worlds. Also the main threats to wildlife conservation which consists of the reduction or even retrieval of the different values wildlife can offer.

KEYWORDS: Economic, wildlife, farm, income, relevance

It has taken time for the international community to realise the value of wildlife. The World Charter for Nature, adopted and solemnly proclaimed by the General Assembly of the United Nations in 1982, addressed the concern of wildlife conservation without referring to the concept of wildlife value. It was only in 1992 at the International Convention on Biodiversity in Rio de Janeiro that a clear declaration of intent to secure the 'value' of the biodiversity of the Earth was made, in particular as follows: – in the range of 'actions' planned by the convention; a number of these nominally refers to the value of biodiversity (i.e.: actions 24 and 36) – the thrust is 'to improve assessment and awareness of the value and importance of biodiversity'.

Several classifications are used for the values of biological resources. As a classic approach, McNeely *et al.* split the values of wildlife into direct and indirect value categories as described below.

DIRECT VALUES

Direct values were considered thus:

– Consumptive use value: non-market value of firewood, game, etc.

– Productive use value: commercial value of timber, fish, etc.

INDIRECT VALUES

The indirect values were classified as follows:

– Non-consumptive use value: scientific research, bird watching, etc.

– Option value: value of maintaining options available for the future

– Existence value: value of ethical feelings of existence of wildlife.

These values carry different weights, which vary according to the respective interests of the stakeholders involved. Although important, virtual values, such as the ethical value, are not as powerful in terms of justification for conserving wildlife as pragmatic ones, such as economic values. Be it relevant or not, financial profitability, economic yield and environmental sustainability are often dominant values for high-level decision makers as well as for grass-root level individuals who live in close proximity to wildlife (17). For this reason, the classification adopted here rather relies on a pragmatic approach differentiating between the following:

– The economic importance of wildlife

– The nutritional value of wildlife

– The ecological role of wildlife

– The socio-cultural significance of wildlife.

All the above-mentioned values are positive. Wildlife, however, may be seen as sometimes presenting negative or adverse values. Depredation of wildlife to people (casualties), livestock (predation), agriculture (crop damage) and natural landscape (invasive pests) are considered counter- or anti-values. However, observers may have different views of the same value: the wildlife protectionist might consider normal for the predators to prey on livestock (positive value for wildlife), while the cattle-owner would see the large predators as detrimental (negative value of wildlife). Obviously, the current value of wildlife is important in itself. However, as time passes, the greatest value of biodiversity may lie in future opportunities brought to humankind to adapt itself to local and global changes.

ECONOMIC IMPORTANCE OF WILDLIFE

To appraise the economic importance of wildlife is as difficult in developing countries as is a classic academic exercise in developed countries. In countries of the north, the wildlife industry does not differ much from other industries with primary, secondary and tertiary sectors. In most countries of the south, the wildlife industry forms a major part of informal activities, which are neither officially registered nor even known or described in many instances. Nonetheless, in both worlds, some of the wildlife values cannot or can hardly be quantified as aesthetic, educational, ecological or ethical values. The rationale of the economic approach is therefore limited to some aspects of the entire issue. The classic categories of wildlife economics comprise the following:

The consumptive uses of wildlife, i.e. a number of activities whereby the wildlife resource is exploited by removing a certain quota of either live or dead animals

The non-consumptive uses of wildlife, i.e. the activity of giving value to wildlife without removing the resource. The entire range of wildlife activities produces revenues and brings added value which contributes to the gross national product (GNP). This added value at the national level is considered as the wildlife GNP which may be compared to the agricultural GNP and the national GNP. For 1989, the wildlife GNP varies from high levels of US$131.7 million in Zimbabwe to low levels, such as US$30 million in the Central African Republic. The respective shares of the official and informal sectors within the wildlife GNP vary considerably: in the Côted'Ivoire, the informal wildlife sector reaches 99.5% of the wildlife GNP, while in Zimbabwe the official wildlife sector reaches 94.7% of the estimated wildlife GNP. Additionally, wildlife may be a source of hard currency. In Tanzania and Kenya, wildlife tourism holds either the first or second rank in exporting activity depending on the year.

According to 'The Importance of Nature to Canadians' survey conducted in 1996, approximately 18.8 million Canadians participated in one or more wildlife-associated activities. Approximately 57% of individuals participated in watching, photographing, studying or feeding wildlife in Canada. Approximately 18% of nationals participated in fishing and 5% hunted. The total expenditure of Canadians who participated in wildlife-associated recreation in 1996 was approximately US$4 billion.

NON-CONSUMPTIVE USE OF WILDLIFE

The non-consumptive use of wildlife is mostly based on the aesthetic value of wildlife. Wildlife becomes the support of the tourism industry, as beaches are the support of the seaside tourism industry. This category of tourism is essentially based on wildlife viewing and is almost entirely part of the service sector.

Participation in most wildlife-associated recreation has steadily increased and is projected to continue to grow in the future. Between 1982 and 1995, there was an increase of 155.2% in the number of people who participated in bird watching in the USA (32), and non-consumptive wildlife use is projected to increase by 61% by 2050 (18). This tremendous increase in wildlife-associated recreation and the expenditure associated with these activities will continue to enhance the economic value of wildlife in North America.

CONSUMPTIVE USE OF WILDLIFE

Consumptive use of wildlife is an ancient practice, as old as humankind and is responsible for the development of the human brain, having been the support of livelihood for most ancient civilizations and enabled survival for many, e.g. the hunter-gatherers, trappers, reindeer (*Rangifer tarandus*) herders, Inuits, etc. The modern man progressively distanced himself from using wild animals as dependence on domesticated animals increased. However, wild animal production remains important to many developing countries and for many developed countries provides an opportunity to diversify crowded domestic animal production, or sometimes even becomes a replacement activity (Scandinavia).

Sustainable use of wildlife is fully recognised as legitimate by all international institutions and conventions. During the last World Conservation Union (IUCN) Congress held in Amman in 2000, sustainable use of wildlife was again officially reconfirmed as a way in which biodiversity could be protected and the development of rural communities could be assisted. The classification used below was chosen for practical purposes. However, no abrupt distinction exists between hunting and husbandry and a continuum covers all wild animal production from the extensive systems to the intensive management practices.

WILDLIFE HUSBANDRY

The distinction between domestic and non-domesticated animals remains theoretical, as follows:

– Most domestic animals may return to the wild as feral taxa, demonstrating that domestication is not a permanent state.

– Many wild taxa may be domesticated and perhaps all may be imprinted.

The so-called non-conventional animal productions are in fact very ancient, having been practised for hundreds of millennia, while domestic animal production (so-called conventional) has been in practice for only a few millennia.

Numerous and varied animal production systems exist for wild and domestic animals. There are grey areas where physical control of the wildlife is limited, yet wildlife products for consumption and trade are highly organised and of high quality

Compared to the number of existing animals, very few are domesticated today (perhaps 20 taxa of mammals out of 4,500 and only a dozen taxa of birds out of 10,000). Some of these animals were domesticated in the past, as in Latin America, where the guinea-pig (*Cavia porcellus*) and the llama (*Lama* spp.) were domesticated by pre-Colombian civilisations many centuries ago. Historical accounts suggest that the Maya raised ocellated turkeys (*Meleagris ocellata*), collared peccary (*Tayassu pecari*) and white-tailed deer (*Odocoileus virginianus*).

Compared to the ancient societies, modern man has made very few attempts to domesticate new taxa. Globally, the income derived from wildlife ranches is made up as follows: 80% from hunting, 10% from ecotourism and 10% from sales of live animals.

Wildlife auction sales in South Africa illustrate the true economic value of large mammals as reflected by the market value. In 1991, 8,292 animals were sold for R9 million in nine sales. In 2000, 17,702 animals were sold for R62.9 million in 48 sales. Average auction sales prices are as follows: roan (*Hippotragus equinus*) sold at R17, 000 in 1991 and R83, 000 in 2000, sable (*Hippotragus niger*) R25, 286 in 1991 and R53,000 in 2000 (T. Eloff, personal communication).

A comparison between the profitability of the various ranching systems (i.e. cattle alone, mixed cattle and wildlife or only wildlife) in the midlands of Zimbabwe concluded that the most economically profitable was cattle breeding, followed by mixed cattle/wildlife (with more cattle than wildlife) and, last, husbandry of wildlife alone. On the other hand, in the semi-arid regions or regions with unreliable rainfall, wildlife alone provides more profit than either cattle or mixed wildlife/cattle, particularly if several species are ranched, thereby allowing uses to be made of the wildlife (hunting, tourism, cropping) .

NUTRITIONAL VALUE OF WILDLIFE

The word ‘wild meat’ is used to designate meat from wild animals, keeping in mind that terms vary widely according to regions and cultures (venison, game meat, bush-meat, *nyama*, *caza*, *gibier*, *viande de brousse*, etc.). Wildlife has been a source of food for human beings since the earliest times. This ancient and currently flourishing meat industry may be considered as both a wild animal and domestic animal production activity. As with the livestock sector, the wildlife meat industry is composed of production systems, processing methods, marketing techniques and consumption modes, traditions and innovations, successes and setbacks. Meat production from wildlife is very diverse; two extremes would be that of the modern deer farming schemes in New Zealand and the informal traditional bush-meat sector in Africa. In developed countries, meat is usually understood as coming from domestic animals, while the so-called game meat is considered a festive dish or delicacy. In developing countries, meat may originate from both domestic and wild animals and in many instances the latter is more important than the former. A controversial battle against bush-meat has been initiated by lobbying groups, such as the North American-based so-called ‘Bush-meat Task Force’, to prevent or restrict people in Africa from consuming the meat of wild animals. Surprisingly, these groups oppose the use of a renewable natural resources such as wildlife and recommend livestock as a substitute (with the destruction of wild habitats), while they do not oppose the exploitation of non-renewable natural resources such as fossil water or petrol. Beyond sovereignty of countries and people, the approach of these groups tends to impose the views of uninformed developed societies on developing cultures, and to substitute indigenous traditional diets with exotic foreign regimens. The debate is ongoing, however, as Adams and Hulme say, bush-meat is not one thing but many, and it is not a simple policy choice that can be accepted or rejected.

WILDLIFE POTENTIAL AS FOOD SUPPLY

Except for a few minerals (e.g. salt), humankind makes his living out of the biodiversity of the Earth, i.e. from either plant or animal living organisms. Wild flora is used across the world (fruits, grasses, herbs, roots, leaves, mushrooms, etc.). For instance, 85 wild plant species are used by the Bushmen (29). Wild fauna is also utilised extensively by either of the following:

– **Vertebrates:** both terrestrial and aquatic mammals, birds, including eggs, reptiles including turtles, lizards, eggs, etc. and amphibians (e.g. frogs)

– **Invertebrates**: Gasteropods (e.g. snails), insects (e.g. termites, caterpillars) including products such as honey.

The choice of the species depends on the socio-cultural (including religious), ecological and geographical context.

ECOLOGICAL ROLE OF WILDLIFE

Broadly speaking, the variety of life in itself has an enormous ecological value. The diversity of taxa and ecosystems influences the productivity and services provided by the ecosystems. When the diversity of taxa in a given ecosystem evolves as a consequence of extinction or introduction of taxa, the capacity of the ecosystem to absorb pollution, maintain the fertility of soils and microclimates, purify water and provide other ecological services changes as well. As is the case for every form of life, wildlife is closely connected to the environment. Being dynamic, it interacts continuously with all the components of the entire ecosystem and has to be taken into account by managers who make the natural resources management sustainable. This creates a difficult challenge as they usually have to deal with short-term issues (R.G. Bengis, personal

communication). The following examples will illustrate some ecological roles, either positive or negative, of wildlife in several components of ecosystems, such as habitat and other animal species, or in ecosystems in general.

SOCIO-CULTURAL SIGNIFICANCE OF WILDLIFE

The perception of nature (including wildlife) depends on the social context, including all the usual components of human sciences. In a short address such as this one, a Manichean approach cannot be avoided in such a complex analysis, which inevitably characterises the situations as, for example, comparing urban to rural situations, north to south, ethnic groups to each other, or one religion to another. The wide range of thousands of case studies has been divided into two broad groups, the so-called 'developed' and 'developing' countries.

THREATENING THE VALUE OF WILDLIFE

The erosion of biodiversity as a whole is a threat to the value of wildlife. The diverse sources of erosion may be organised in two groups, as follows:

a) Indirect threats through habitat degradation

b) Direct pressure on wildlife.

Indirect Threats

In many industrialised countries, such as those in Western Europe, radical changes in agricultural landscapes occurred during the 20th Century and appear to be the most important factors that explain the decline, not only of the birds characteristic of open fields like the grey partridge, the European quail (*Coturnix coturnix*), the skylark (*Alauda arvensis*) or the little bustard (*Tetrax tetrax*), but also of species dependent on the hedgerows which were destroyed to enlarge the fields, such as the kestrel (*Falco tinnunculus*), the turtle dove (*Streptopelia turtur*), the red-backed shrike (*Lannius collurio*) and the ortolan bunting (*Emberiza hortulana*). Wildlife can be used to enhance the returns from the land, in addition to other land uses. In many instances, hunting leases earn more income than timber exploitation. Banning of hunting would remove this key incentive for forest conservation. In the developing world, hunting is not only important as a source of food, but is also of value in controlling crop depredators and as a source of income. Hunting may also have conservation benefits. It is one of the few ways in which local communities can derive benefits from wildlife, and by offsetting some of the direct and indirect costs of forest conservation, communities thus have an interest in the conservation of natural habitats (13, 16).

Direct Threats

Excessive harvest of wildlife depletes the wildlife resource when the level of exploitation overtakes the recruitment rate. Excessive harvest may be either legal or illegal, as follows:

– Legal, when the management scheme is inappropriate or ineffective

– Illegal, uncontrolled, poaching means mismanagement of the resource.

Unmanaged hunting may have detrimental effects on wildlife. Some hunting studies in South America conclude that many of the largest mammals and birds are hunted preferentially and represent a large proportion of the forest biomass which, therefore, might decrease under severe hunting pressure. Moreover, the species most favoured by hunters such as agoutis (*Dasyprocta* spp.) and peccaries (*Tayassu* spp.) play an important role in pollination and seed dispersal, which suggests that when and/or where they are overexploited, their disappearance might change the composition of the forest.

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