Wildlife Conservation, Food Production and 'Development': Can They be Integrated? Ecological Agriculture and Elephant Conservation in Africa[1]

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ABSTRACT: It is widely believed that (i) there must be a conflict between food production and conservation, and (ii) that development must be related to economics. Both these beliefs are questioned. It is suggested that ecological agriculture, which includes ethologically and ecologically sound animal management (the criteria for which are outlined) can reduce conflicts between conservation and food production. African elephants are taken as an example illustrating different attitudes to conservation. It is proposed that, rather than developing further the present common conservation attitude of 'wildlife apartheid', the future of elephants in many parts of Africa may rest on bringing them closer to the voters where the welfare of neither the human nor elephant is compromised. Here, they can act as both as workers, and as 'wildlife ambassadors'. This approach needs further research and development, but preliminary results show significant possibilities for reducing these apparently conflicting land use interests in some geographical areas.

KEYWORDS: elephants, conservation, animal welfare, ecological agriculture.

INTRODUCTION

It is widely believed that there is almost by definition, a conflict in terms of land use between wildlife conservation and agricultural development / food production. It is an *either/or* situation: the land can either be used for agriculture, or for wildlife. An assumption is made that integrating wildlife and agriculture is difficult, if not impossible. Many countries have advisory services which make this assumption of separating land use for one or the other function (e.g. Farmers' Union Wildlife Advisory Service, UK). In Africa, this conflict is becoming of crucial importance for conservation of wildlife for two main reasons: (1) rapidly increasing rural populations, and (2) traditional cultural values that emphasise the importance of having land for food production. In this paper, I will argue that this belief should be reexamined, and that food production and wildlife conservation can, at least partially, be reconciled.

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Another belief that needs some discussion is that 'development' should be measured by economic growth, whether this is of the individual, the community or country (e.g. George 1976). Here 'economic development' may be welcomed, often without a serious assessment of its long term consequences to the population itself. For example, in a developing country, if a foreign company wishes to invest money in building a new factory, and thus provide jobs, it is encouraged, often without the rigorous legislation that is in place in most industrialised countries to control either environmental consequences (e.g. pollution of the local water, air or soil, extermination of local fauna and flora) or social consequences (e.g. labour migration, urban development, or health hazards).

One reason why it is held that development should be measured by economic growth may be the further belief that the utilitarian moral goal of increasing the total sum of human happiness, will only be met by economic growth and more money for all people. Such a goal may become one of the major threats to the conservation of wildlife in the future and hinder the development of integrated farm and conservation strategies.

However, both beliefs are worth questioning. Self-sustaining peasant populations, which have always been relatively independent of the economy by growing all their own food and supplying most of their other needs, are generally considered 'underdeveloped' and encouraged in many ways to enter the economic society. Consequently, there are many rural populations who previously could support themselves in food who no longer do. Some may have money, but if there is no food to buy, they starve. This has happened where peasant agriculturalists are given credit to buy seeds, fertiliser and pesticides to grow cash crops at the cost of their food crop. If the market for the cash crop collapses, or it fails, they then have no food, and debts to pay (Dahlberg 1979; Kiley-Worthington 1993 for further discussion). Such examples suggest that the linking of development with economic growth may be seriously misguided.

Whether economics should dominate the idea of development also becomes increasingly questionable, when there is little evidence for an increasing quality of life in many parts of the world, with more malnourished and starving people (e.g. Meadows et al. 1992). Originally, rural populations of agriculturalists and hunter gatherers were dependent on their own energy and efforts to live, and from the records we have, not all of them had a very hard life – even those in difficult climatic areas (e.g. aborigines and bushmen in desert climates spend little more than 2 hours a day finding their food). The values and lifestyle of such people could, perhaps, be important in helping towards a reassessment of improving the quality of life, and reducing ecological, ethical and ethological problems in much of Africa, (and perhaps many other countries). Areas recently resettled where small plots of land are being allocated to rural peoples provide one example where such values and techniques might be particularly relevant and applicable. Thus, the first point is that the conflict between wildlife conservation and development is particularly acute where development is associated with economic growth. However, there are many reasons for thinking that development can and should be understood in other ways.

Even if this is done, serious questions and conflicts that need thought and discussion on integrating issues of wildlife conservation, food production and development will remain. But, there are some additional approaches that might be helpful.

Deep Ecology (Naess 1990) is founded on a respect for all nature and a recognition of its value. This has become an important standpoint for many environmental movements, yet their positions are often ridiculed, or labelled as impractical, particularly in developing countries. One aspect of ecology which needs greater emphasis than Naess gave it is the essential dynamic nature of ecosystems: each species interacts, directly or indirectly, with others, each is dependent on others as well as on the non-living world, and each affects others. Humans are not separate from this system.They still carry out all the functions of living creatures, and affect others. It could be mice, mammoth or dinosaurs who in sufficient numbers and with sufficiently consumptive lifestyles threaten the very existence of the living world. An emphasis on the inter-relatedness of humans with other species, rather than their separation, might increase the number of people with sustainable lifestyles.

Much of the pressure today from those concerned with conservation is the result of a belief that humans are somehow outside the living world. 'Nature' is like a famous painting: to be admired and respected, but which the observer is not part of, and would only spoil if s/he were. This prevalent view has given rise to '*wildlife apartheid*' (separate development) of humans from the rest of the living world (Kiley-Worthington 1990).

Another recent development concerns the ethics of animal husbandry, and killing. It is generally agreed by most thinkers and researchers on these issues, that higher mammals at least, are 'sentient': they feel, have emotions and consequently can suffer, and feel joy or happiness (Singer 1976, Regan 1983). Since this is the case, there is a responsibility to ensure that animal suffering is minimal. It has also been argued that it is humans' moral responsibility to recognise and allow different species to fulfil their 'essence': their 'telos', if suffering is to be minimal, and the animals able to have a life of quality (Clarke 1976, Rollin 1989).

Suppose we agree that: (i) the natural world must be respected, but integrated with humans' needs; (ii) sentient beings, including humans, should have lives of some quality that are relatively free of suffering, and should be allowed to fulfil their 'telos'. The question then is, how can these ideas be fitted practically into the real world with its conflicts and confusions over wildlife conservation, food production, agriculture and development?

THE TYPE OF FARMING.

The introduction of high input agriculture inevitably drags people into the monetary economy, and consequently reduces their independence, and sometimes political 'freedom'. But techniques are being developed to enable both

small and large farmers to provide all their families' wholesome varied diet, shelter, and even power sources from the farm itself, without buying in products from elsewhere (e.g. Ecological Agriculture, Permaculture, Organic Agriculture, 'Natural' farming, and Bio-Dynamic Agriculture). Such an agriculture concentrates firstly on producing food and other products (e.g. fibres, building materials and so on) for the family or local community. If there is more produced than is needed, then that is sold to provide some cash for 'luxury' type items.

In such a system, the operation of the natural ecosystem is explored in order to be used by the farmer working, for example in the control of pests by natural predators (e.g. Woods, 1974), or the use of indigenous plants, and growing of those that flourish in the existing environment, rather than trying to change the environment to suit the crops.

- Evidence of physical ill-health (including poor nutrition, wounds etc.)
- Evidence of frequent occupational diseases
- Need for the use of drugs and/or surgery to maintain the system of husbandry
- Behavioural changes:

  a) performance of abnormal behaviours (that are not normally in. the animals' repertoire, and which appear to be of little benefit to the animal: e.g. running at bars, pacing)

  b) stereotypies i.e. the performance of repeated behaviour fixed in all details and apparently purposeless (e.g. crib-biting, wind sucking, weaving, head twisting)

  c) substantial increase in inter- or intra-specific aggression compared to the wild or feral state

  d) large differences in time budgets from the wild or feral animal

  e) substantial increases in behaviour related to frustration or conflict (e.g. often behaviour relating to locomotion and/or cutaneous stimulation)

  f) substantial ontogenic behavioural changes (animals performing behaviour characteristics of a very different time in their development e.g. calves of 16 weeks walking as if they were a day or so old)

- Behavioural restrictions – this is the inability to perform all the behaviour in the animals' natural repertoire which does not cause severe or prolonged suffering to others

FIGURE 1. Possible indicators of distress in animals

Acceptable Animal Husbandry

The animals kept on the farm (or elsewhere under human jurisdiction) must be able to adapt and live in the existing conditions rather than introducing foreign animals not well adapted to the environment.When different species or breeds of animals are introduced to alien conditions, they are usually severely confined and restricted, provided with artificial environments in enclosures or buildings, special expensive diets and much veterinary care (e.g. Zero Grazing system for the Heifer Donation Programme, USA). Such developments are undesirable because (i) the required husbandry system is expensive in economic and ecological terms, and it is unlikely that it is something that the local small farmer can, or should afford without further economic aid; (ii) there is little doubt that animals suffer in such environments (Stamp-Dawkins 1992, Kiley-Worthington 1990) where there is evidence of behavioural distress and restriction (figure 1).

It is important to consider the welfare of the domestic farm animals in 'developing' countries, just as it is important to consider that of the wild animals. In order to minimise both physical and psychological suffering of the animals, a list of tenets can be drawn up that should be fulfilled for the optimal husbandry. As well as showing no evidence of distress, consideration must be given to the appropriateness of the (i) physical, (ii) social and (iii) cognitive environments for (a) the species and (b) the individual. Ideally, the animals should be able to perform *all the behaviour in their repertoires which does not cause suffering to others* (figure 2). Further discussion of why these tenets have been selected has been published elsewhere (Kiley-Worthington 1989 and 1990).

1 The animal should be allowed to perform all the behaviour in his repertoire which does not cause prolonged or acute suffering to others.

2 The animal should be able to associate in the groups, size and structure appropriate to his species and past experience.

3 The animal should be in an appropriate physical environment (e.g. forest or simulated forest if forest dwelling, etc.)

4 There must be no evidence of prolonged distress.

5 The animal's 'telos' must be catered for by considering the way he perceives the world, his receptors; his brain anatomy, his cognitive ability, his specific learning abilities and his communication system.

6 The animal must be considered not only as a representative of a species, but also as an individual, and his past experience must be assessed in order to design the most appropriate environment for him as a) a member of a species and b) an individual.

FIGURE 2. Criteria for ethologically sound environments for animals

In order to maintain the long term sustainability of the animal keeping enterprise, and reduce environmental problems the animals must also be kept in 'ecologically sound environments'. This effectively means assessing how all the animals' needs (e.g. food, shelter, movement patterns etc) can be catered for without causing environmental problems to the physical or social environment of other species, including man. Again, a list of 'tenets' that should be fulfilled can be drawn up (figure 3). Finally, when the animals (or humans) are in environments which can be considered both ethologically, and ecologically acceptable, then they are also ethically acceptable (figure 4).

In this way, instead of there being a conflict between farming and wildlife conservation, the whole farm becomes a conservation area where the wild as well as domestic fauna and flora are utilised. In areas where there are no remaining large wild animals who are dangerous or destructive, such as in Europe (where bison, bears, wolves and wild boar have long since become eradicated), this is relatively easy. But, if Africa is going to model its wildlife conservation on the 'developed world's' approach, there will be little future for many of the large animal species which so far have not become extinct in all areas. The problem is how can elephants, rhinos, giraffe, lions and so on be integrated into the farm? In order to explore possibilities for alternative conservation strategies for the future, we take elephants as an example, a species whose conservation is causing much controversy (Wildlife Conservation 1993).

They should cause no long term or irreversible environmental change by considering the local and global environmental effect of all aspects of the husbandry. In particular:

1 The effect on other species of plants and animals

2 The long term and short term effects on the physical environment, (e.g. soils, tree destruction etc.)

3 The effects on local humans of the husbandry (e.g. any 'nuisance' or environmental value)

4 Provision of appropriate food which causes no adverse ecological effect locally or globally

5 Provision of other environmental needs of the animal. For example, supply of materials for shelter, shade, nesting materials, heating etc and their environmental effect

6 Appropriate climate and ability to adapt to chances

7 The origin of the animals, and its local and global effect (particularly if captured from the wild).

FIGURE 3. Criteria for ecologically sound environments for animals

1 The local and global ecological effect of the system is considered in relation to the biological, environmental and aesthetic value to humans and other animals.

2 The animal is in the type of environment which is ethologically sound, where he is 'happy' and not showing distress, and able to perform all the behaviour within his repertoire provided this does not cause suffering to others.

3 Consideration to him as a sentient being of moral concern is shown.

4 The animal, human and rest of the environment have a symbiotic relationship which is of mutual benefit rather than competitive. The relationship of the animal to the human could be considered rather as one of an employee than a tool or slave.

FIGURE 4. Ethically acceptable environments for animals and humans

DIFFERENT APPROACHES TO WILDLIFE CONSERVATION, WITH REFERENCE TO ELEPHANTS

Some of my earliest memories are those of travelling around the Serengeti, Tanzania, long before it was a National Park, with my father, a founder of African conservation and one of the original members of IUCN , the International Union for the Conservation of Nature. At that time in the early 1950's, his job was to make recommendations on where national parks and nature reserves might be created. My father would lecture me then on the difference between '*nature preservation*': the keeping of an area as it is, frozen in a moment of time, and '*conservation*': the recognition of the dynamic character of natural ecosystems, and the keeping of it in a sustainable way by utilising its products. All species use others in various ways, and even the climax eco-type of an area is not static; things change year by year as areas are opened up (bush turns to grassland), and other areas regenerate to bush. Fire may come, the rains may be unusually long, or there may be a drought. By definition: living systems are dynamic and changing. So what are 'conservationists' trying to achieve? To allow the natural changes to take place, or to manage the eco-system so that it remains frozen in a moment of time? The former approach has been that adopted by the Kenya Wildlife Services, the latter that of the South African Wildlife Parks. The South Africans argue that because of the restriction of conservation areas, the area will become 'over populated' with elephants. To prevent this, every year some elephants must be killed, even in the national parks in order to prevent and control habitat change.

There are problems with this approach. In the first place, what is 'over population' and how is it to be measured: when are there 'too many', when 'just enough'? Does it go without discussion that a conservationist must maintain the existing eco-type? If the ecosystem is to change, then how far should this be permitted by conservationists? These debates have arisen over the last two decades, concerning the control of African elephants in Tsavo National Park, Kenya (see Wildlife Conservation 1993, Ricciuti 1993) but to date there appears to be little resolution.

The South Africans' argument is that elephants must be killed and the income generated from the meat and the various processed souvenir pieces (feet, tails, heads and skins) of the killed animal is then filtered back to help conservation, this is what the South Africans call '*conservation with utilisation*' .The most important income was from the sale of the ivory, the international trade in which both the South Africans and Zimbabweans are now able to reestablish as a result of the recent CITES meeting in Harare (June 1997).

In South Africa, apart from earning money from eco-tourism, the utilisation of animals to serve conservation has largely been confined to them serving the cause with their lives. For example, at a conference entitled 'The Exploitation of Mammals' held in London in 1994, the director of the Mammal Research Unit in Pretoria, (an institute in the forefront of thinking on conservation in South Africa) proposed that giraffes, blesbok, gnu, kudu, and zebra should be selected and bred for meat production (Skinner 1994). To cater for this market it would be desirable to breed for giraffes with extra long necks, or larger antelope with bigger rumps to maximise the best meat cuts.

By contrast, until recently, the Kenya Wildlife Services have been committed to the belief that National Parks were areas where animals could live without being hunted and killed by humans. However they have had a extremely difficult period with poachers who dramatically reduced the elephant populations in some areas. Nevertheless, rather than encouraging a trade in ivory and thus encouraging poaching, they took the remarkably courageous stand of burning their ivory reserves to reduce the trade (Leakey 1993). Now the population numbers of elephants are rising again, and they are having an effect in changing the ecology in some National Parks by, for example, destroying trees and turning bush land to grassland. Not everyone argues that this is the effects of 'over population', some argue that this is the natural way in which ecosystems evolve (Western 1993).

In Zimbabwe a variety of approaches to elephant conservation are practised (Pinchin 1992). In the first place it is often considered that the way the animals can contribute to the conservation of their species is by individuals being killed: hunted. Generally this killing is done in areas adjacent to the national parks or in particular shooting areas, and tourists pay relatively large sums to shoot an elephant (or other animal). This money is distributed to the community through the 'CAMPFIRE' community project (Child 1991). Thus the local community

has a direct monetary gain, even if some of their crops have been destroyed by the elephant.

An important ingredient in this debate is to have, at least some understanding of what mental abilities elephants have. Should we treat cockroaches, humans and elephants the same, and if not why not?

Elephant cognition

The most interesting question remaining in animal welfare is that of different species' mental abilities. The distinction in the treatment of humans from other species rests on a belief that humans' mental life is (or potentially is) greater and more complex than that of elephants. However elephants are sentient, feeling emotional beings. In addition they have the largest brain of any terrestrial mammal. Although brain size may not be related directly to cognitive/mental abilities, they have enlarged forebrains (the part of the brain that is generally associated with thinking, even rational thought, decision making, symbol using, beliefs and decisions). There is accumulating evidence to suggest they have advanced cognitive (mental) abilities.... in other words they appear to be much more like humans in their mental abilities than was previously thought (e.g. Moss 1988, Douglas-Hamilton 1993 and Kiley-Worthington and Randle forth coming).

This raises two questions relevant to the debate. First, since they appear to be more similar to humans cognitively than was previously considered, and consequently apparently feel some similar emotions, such as grief, attachment to their family, and frustration, should they be killed, any more than, say, too many humans in an area? Secondly, if they are to be killed, then how is it to be done? When individual animals are shot in their family groups, this causes extreme distress to other family members who have been observed attempting to hold up, and help their dying relatives and friends (Moss 1988). When the older members of the group are killed, the remaining youngsters seem unable to locate themselves and find the resources they need to continue with their lives (Moss loc cit). Recently, the South Africans have decided to kill whole family groups but, it is doubtful that this annihilates these concerns since elephants at a distance still respond with agitation to the killings.

Elephant can cause problems with human safety and possessions

Elephants do migrate or break out of nature reserves, raid crops and occasionally kill or frighten villagers in many areas where they live (e.g.:Waithaka 1993). Sometimes this is because of food shortages, sometimes apparently for other reasons. In Laikipia district, Kenya, they broke through the fences from a private nature reserve onto the farms and garden crops of the local people. The reasons for this behaviour need clarifying, in order to work out a solution. Should the

culprits be killed? If they are, will this stop the problem? In Laikipia there had been a history of a gradual electrification of the fences. Once the elephants broke through one type, further elaboration was introduced. Although in other areas, elephants had been contained by simple electric fences, by the end of four years, in Laikipia they were solving the electric fence obstacle with increasing ingenuity. It looked as if the elephants had learnt to get through the increasingly elaborate electric fences as a result of the gradual introduction of more complex fences. These included a live trip wire at the base, an overhanging wire at the top, higher fences and more frequent electric wires. The elephants had learnt to wind their trunks around the large upright posts supporting the wires (some of which had been cemented into the ground), loosen them and then pull them out, and step over, all without touching the electrified wires (Kiley-Worthington 1994). This involved advanced learning, perhaps the elephants had learnt to do this as a result of being reinforced and consequently motivated by solving the problem, a relatively well known phenomenon in learning theory (Pearce 1995). If this was the case, then different solutions to the problem must be tried, since shooting the elephants, quite apart from being undesirable, would be unlikely to solve the problem.

I will argue that there other ways in which these animals might contribute to their own survival than by being killed. There is of course money earned from viewing and photographic tourism which does not immediately cause death. In the short term this is certainly helping elephant survival in many parts of Africa (e.g. Douglas-Hamilton 1993), but the problem of 'overpopulation' of the elephant remains. There is also a growing apprehension concerning whether reliance on tourism to ensure conservation is wise in view of increasing competition from different areas, political insecurities, world economic depression and increasing population pressure. All of which are putting greater pressure on National Parks.

Another approach is to consider other products that could be harvested from various animals without curtailing their lives, yet while ensuring they have a life of quality that is both ethologically and ecologically acceptable (Kiley-Worthington 1989). One renewable product of high value here (which is the source of another major controversy at the present) is rhino horn. Rhinos can regrow their horn (unlike elephant tusks) at the rate of around 9cms/annum (Berger 1993).Thus in around 8-10 years they have grown a complete set of new 'horns'. If there is to be a trade in rhino horn for dagger heads and aphrodisiacs, rhino horn could be harvested every few years even from the wild animals. In order to do this with ease, the rhinos must be accustomed to humans. Since there are now so few black rhino left , they virtually have to be under permanent guard to prevent poaching, and consequently, become more familiar with humans. With correct handling cutting off part, or all of the horn can be done without drugs, immobilising or causing trauma to the animals (pers. experience, Imire Safari Ranch).

Elephants do not have such a promising product that could be extracted and regrow except, of course, for a few tail hairs that can be cut off for good luck bracelets. What they do have is enormous strength and energy, an ability to learn fast, and a propensity to form good long term emotional relationships with others, even of other species. Hannibal crossed the alps with African elephants in 219BC (Delort 1992). Some elephants could and are being trained and used to earn foreign currency by giving tourist rides. This is now happening in Botswana, (e.g. Elephant Back Safaris) in Garamba, Zaire, at Imire Safari Ranch, Wedza, Zimbabwe and at other organisations in Zimbabwe.

Another important function trained elephants could perform is carrying anti-poaching and law enforcement patrols in and around national parks, private nature reserves and even in shooting areas. In addition they could be used in certain places for law enforcement, by the police and the army. For law enforcement in rural areas elephants have the advantages that they do not need roads, they can move with stealth through difficult terrain where vehicles cannot. They do not need mechanics or spare parts which are unobtainable, they can feed themselves, cost less and can reproduce themselves.

There is no doubt that the African Elephant can be taught to carry people and to do draught work. For two months in 1996 and two weeks in 1997, I conducted research on the methods of teaching and its practicality by teaching six elephants and six handlers at Imire Safari Ranch, Zimbabwe (Kiley-Worthington and Randle forthcoming).

The teaching requires both some skill and knowledge, but, these can be taught to motivated people. It is important that it is done safely and without the animal's or human's welfare being compromised, thus both the teaching and the husbandry of the elephants must be ecologically and ethologically acceptable. Our experiences with large mammal training, including the African elephants, is that correctly taught, they are quick to learn, can grasp relatively new concepts easily, and learn the job they are doing, so that, unlike mechanical aids, they can become skilled decision makers and operators, if correctly taught. This is not unusual, for example, a draught horse delivering milk learns his round and stops and continues at each relevant door without the driver having to start and stop the vehicle by getting in and out. An elephant learns the effect of the plough he is pulling and lines himself up at the appropriate place for the next furrow. When lifting bales, s/he learns where they are to be stacked, takes them there and places them appropriately. For years, an Indian elephant was used in India to load and unload railway trucks with circus equipment. She was able to judge the size, the positioning and the way of manipulating each piece of equipment. Elephants used to extract timber also are taking decisions to achieve goals in their daily working life, and they become more and more skilled at the work (pers. com., Mahouts from South India 1996).

That the teaching of indigenous African animals to work is possible has been known for a long time. Even in 1914, BvKenya, a hunter who hunted elephant

for ivory on the Save river in Zimbabwe, had seen buffalo pulling carts, zebra used as pack animals, eland being milked. However, it is important to use the most appropriate energy source, for example, it may be appropriate to use elephants to plough five hectares, but not two hundred which would be very much quicker with tractors.

There are two important areas in which a relatively small number of these animals could seriously help the local communities and consequently with their own conservation, without losing their lives, the traditional approach to elephant conservation in Africa to date. The situation is different in Asia (Delort 1992).

Elephants as Workers

Trained elephants can help by doing appropriate work. For example, they can collect heavy objects and pull them around: timber for firewood or building materials. They can move earth and help with the construction of roads, dams and so on. Gravel roads need maintenance, particularly during and after the rains, they can pull road scrapers and flatteners (figure 5), carry bales (figure 6) or help with the distribution of fence posts. Then they can do draught work by pulling carts and wagons carrying grains, tobacco, hay or straw, manure and other farm products, or transporting people (figure 7). When correctly taught, they can move large and heavy objects such as boulders, and even build dams.

They can also do draught work on the land, and help relatively small farmers with some of their work: ploughing, harrowing, cultivating, seeding, weeding

FIGURE 5. One elephant pulling a road scraper, while the one on the right is learning by walking beside

and so on. The small farmer would not own or be able to keep an elephant, but the whole community might have the facilities to do this. In certain locations (e.g. near nature reserves or private wildlife parks), it would be possible to contract an elephant and his handler to work. Having elephants that could work part time in communal areas is one way in which the commercial farmer, or national parks and nature reserves could contribute to helping the community farmers.

FIGURE 6. Elephant learning to lift bales

FIGURE 7. Elephants learning to pull a trailer with a load of manure

Elephants as Wildlife Ambassadors

Perhaps the most important factor which will affect their future conservation in many areas, is that bringing the elephants into the human community to work and help, ensures a greater familiarity with the species for the people in the rural communal areas. As a result of having close pleasurable contact with the animal, such as when working with him, even exchanging eye contact, or touching him, there is increased knowledge gained about the animal, and an intuitive recognition of his/her emotions (McGregor 1997). In this way increased understanding of the animal's usefulness and importance is enhanced. The animals are experienced: touched, smelt, seen close, watched, admired and identified as individuals by the people who may never have seen touched or handled a member of this species before. As a result of such contact, an increasing respect and recognition of the species value can grow. This is not just an admiration of an alien beautiful creature living his own life, rather a growing respect for the underlying similarities to humans. There is a recognition of similarities as well as differences, often analogous to the way one views a different human culture: where one can underline similarities in the way we react to the environment, but also differences; and even have glimpses of a new and different world which may enrich and enliven our own lives. It can give us new experiences, and new solutions to some problems . In this way, the 'value' of that particular animal, and by association his species, can be greatly enhanced in the community.

If it is true that humans lives can be enriched by the presence and proximity of other animals, then provided the education and husbandry of the animal is ethologically sound and s/he does not suffer as a result, then his/her life may also be enriched by this contact. This can then develop into a mutually beneficial experience: an animal/human symbiosis.

The rural farming people make up a sizable portion of the voting population, but have very little likelihood of visiting a national park or nature reserve. Even if they do, they will not experience the animals in the same intimate way as when they are brought into their community as 'ambassadors', to help or educate the public.

There are those who find this idea curious, and somewhat against their understanding of 'the wild'. There is certainly a place for conservation of 'the wild' unaffected by humans (although it hardly exists anywhere worldwide) but in Africa and much of Asia, with exponentially growing populations, unless alternative approaches to conservation are proposed, many of the large mammals could shortly become extinct. Another consideration is that from the individual animal's (or human's) point of view 'the wild' has disadvantages. There are times, for example, when food or water is very scarce, or individuals are terrified, hunted, killed or wounded. If a predator, times when they persistently fail to kill to eat. Death or prolonged suffering can be common from preventable and treatable diseases, infections and parasites. Provided the animals kept in association with humans have environments designed so that they are not caused any prolonged suffering and distress, and have few behavioural restriction, (they are

always well fed and watered, they live in appropriate social groups, they can breed and raise their own young, and exercise all the behaviour in their repertoire that does not cause suffering to others), they should be able to have lives of, at least, the same quality as that in the wild; sometimes better, since they need not have the unpleasant restrictions and suffering characteristic of 'the wild'.

For African elephants, it appears to be possible to fulfil these criteria, and have the animals living symbiotically with humans. With correct environmental design and positively reinforced teaching, they can live their own lives in social groups, but also come into contact with humans and learn to provide energy and skill for useful work (Kiley-Worthington and Rendle 1997). Other animals might be able to provide various other products (e.g. eland and buffalo: milk; buffalo and zebra: transport and energy; horn from rhinos; wool and fibre from various other species).

CONCLUSION

Clearly it is crucial that both the husbandry and the teaching of any animal in association with humans is designed and practised so that the animals do not suffer, and have lives of quality in a semi-domestic type of environment where they could be 'ambassadors for conservation' for both rural and urban populations. This does appear to be possible, at least with the African elephant, although more research is needed. There will not be a place for all the elephants. Nevertheless this offers a partial compromise to the two sides of the present CITES debate on elephant conservation.

Thus the semidomestication of some wild large mammals to act as ambassadors and work among the local human population on ecologically run self-sustaining low input farms, marries conservation, food production and development. It can demonstrate the practicality of living symbiotically with the natural world, and in many ways reflects traditional tribal African values.

NOTES

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