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SHAHINA A. GHAZANFAR

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Shahina A. GHAZANFAR
Royal Botanic Gardens Kew, Richmond, Surrey TW9 3AB - U.K.

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Abstract: The Convention on Biological Diversity (CBD) set a number of targets to work towards by 2010 in order to aid conserve the world's biodiversity. Several countries are now aiming at ex-situ and in-situ programmes for the protection and conservation of plant species through the Global Strategy for Plant Conservation targets (GSPC). Is it possible to achieve these targets in rapidly developing countries where the usage of land for urban expansion and agriculture to support basic human needs holds priority? How can conservation and development be sustainable? I take examples from a rapidly developing country in the Arabian Peninsula to show the difficulties faced for conservation programmes through lack of education, awareness, changing behaviour patterns, lack of community-based management programmes, and most importantly where the costs of implementation of conservation programmes cannot be met.

Key Words: Arabia, conservation, CBD, developing countries, GSPC, public awareness, urban development

Introduction

We all recognise the widespread and accelerated loss of biological diversity and the importance of this loss to a region's economy and culture, and the need to do something about conserving and preserving it. Whether a country is rich or poor, the problems are similar: habitat destruction, intensive agriculture, overgrazing, pollution, development, over exploitation, introduced competitors and predators. As for the problems, the solutions are set as well: setting priorities, planning, monitoring, diagnosing problems, management, legislation, education, public awareness, and integrating development and conservation (Sutherland, 2006).

Whereas in most countries problems for the loss of their biodiversity have been identified, the solutions have been difficult to put into practice. The reasons for this are various from lack of management, and lack of legislation, to lack of education and public awareness and effective integration of development and conservation.

A major problem in how conservation can be effective is that we lack information and documentation on conservation projects that have been carried out, especially in poorer developing countries. There is an emphasis on success stories, understandably so as many conservation projects depend on short term funding and the chances of funding a totally successful programme (or ostensibly so) are better than the one that is not. Therefore, a lack of documentation on failures (and successes as well) have meant that we have not learnt from our actions fully, and we still know very little on how to go about conservation. This is particularly true for developing countries where there is a requirement for educated people who understand and are aware of their conservation needs, a lack of funds and other resources, meaning that conservation is to a great extent carried out by programmes and projects formulated externally that do not fully integrate the country's need for development with conservation.

In this article I will look at conservation in developing countries using examples mainly from the Arabian Peninsula in order to bring out the main problems that, in my opinion, should be dealt with for conservation to be effective.

Global Strategy for Plant Conservation (GSPC)

The Convention on Biological Diversity (CBD) (UNEP 2002) set a number of targets to work towards by 2010

* E-mail: s.ghazanfar@kew.org

in order to aid conserve the world's biodiversity. Several countries are now aiming at ex-situ and in-situ programmes for the protection and conservation of plant species through the Global Strategy for Plant Conservation (GSPC) targets.

Global Strategy for Plant Conservation (GSPC) targets:

1. Understanding and documenting plant diversity: gathering baseline data

- Working list of known plant species,
- Preliminary assessment of the conservation status of all known plant species at a national, regional, and international level,
- Development of models with protocols for plant conservation and sustainable use.

2. Conserving plant diversity

- Protection of 50% of the most important areas for plant diversity,
- 30% of production lands managed,
- Management plans in place for at least 100 major alien species,
- 60% of world's threatened species conserved in situ,
- 70% of the genetic diversity of crops & other valuable plant species conserved, and associated indigenous and local knowledge maintained,
- 60% of world's threatened species in accessible ex situ collections preferably in the country of origin; 10% of them included in recovery and restoration programmes.

3. Using plant diversity sustainably

- No species of wild flora endangered by international trade,
- 30% of plant-based products sustainably managed,
- Decline of plant resources, and associated local knowledge, practices that support sustainable livelihoods, local food security, and health care, halted.

4. Promoting education and awareness about plant diversity.

5. Building capacity for the conservation of plant diversity

- The number of trained people working with appropriate facilities increased, according to national needs,
- Networks for plant conservation activities established or strengthened at national, regional, and international levels.

Achieving GPSC targets in developing countries.

What does it mean to achieve the GPSC targets in developing countries?

What are the factors that developing countries lack in order to achieve the targets?

Here I list 3 factors that have a major role in any conservation plan for a developing country:

- availability of funds,
- urban development: usage of land for urban expansion, development, and agriculture to support basic human needs, the need for houses, schools, shops, roads, airports, harbours, etc. for a growing and developing nation,
- education and conservation awareness, and the use and integration with local expertise: there is a lack of information and knowledge about biodiversity and conservation in schools and university curricula and of trained people and training programmes. In conservation projects there is very little or no participation and input from the local people, their needs and cultural values, where conservation programmes are mostly based.

Funding for conservation projects, whether in a developed or developing country, is vital.

Conservation, if to be taken seriously by a country, has to have a separate set up. It cannot be effective as part of a department of environment or agriculture, as most budgets allocated in such cases go towards development of the environment and agriculture rather than towards conservation; and there is always a battle for allocation of funds for conservation.

The results of a project or programme for conservation are not always immediate. Most governments will allocate funds where results are "visible" or profitable. Also most conservation projects are not short term and governments will not promise funding on a long term basis. It is therefore important that firstly

a need for conservation is recognized and understood on a long term basis, and then funding is sought through governmental or non-governmental organisations (NGOs) to achieve these goals.

NGOs are effective in raising money mostly through private donors, and often do very well with voluntary workers. However, these organisations often suffer from a lack of paid skilled workers, and are often run by the motivation of one or two individuals. If the key person leaves or looses interest, the organisation often crumbles.

Urban development will always hold priority over conservation in developing countries, especially fast developing countries such as the United Arab Emirates and Oman in the Arabian Peninsula. There is a genuine need for housing, roads, and recreational facilities for the people of a country, and tourist attractions (hotels, resorts) are important for the economy of a country. Although conservation and development can be integrated in some cases, in most instances conservation usually gives way to development.

It is most important to identify the conservation needs of a developing country, make a plausible management plan in much detail as possible, and try to integrate it with development plans.

It is now a common practice that any development project needs to consider the affects of the project on the environment. This usually comes in the form of an environmental impact assessment (EIA). As there are few trained biologists in developing countries, and those that are trained may not have adequate know how on how to carry out an EIA, EIAs are often done by companies hired by developers that are not fully knowledgeable of the country's needs on conservation. Often conducting an EIA is a rushed assessment to fulfil the basic legislative requirements so that developmental projects may start; and very often long term effects on environment are never addressed. A good example from Oman can illustrate this. A Ministerial Decision (23/99) bans the cutting or removal of live trees in Oman. Sweet soil or "wadi" soil removed from wadis as it is not saline can be used for horticultural purposes. However, most wadis have trees (usually *Acacia tortilis*). Developers, recognising the ban, remove the soil (up to 1 m) from around the trees, leaving the trees to stand on up to one meter high pedestals. These trees have no chance of survival in such a state. This perhaps shows an extreme case, but the fact is that it is there and is happening. Destruction of wadis and its vegetation can be avoided if proper EIAs are conducted and there is an awareness of conservation.

Education is one of the major venues that conservationists have to depend on for biological conservation. For any in situ conservation, it is not only the identification of species that is needed but also the knowledge on how to maintain the viability of populations. For this information, a systematic collection of baseline data on the natural history of the species is needed. For this, the factors threatening populations are required. We need to know: Is the population actually declining? Which are the factors that determine the viability of the population?; Is the legal protection of the habitat alone a sufficient measure to maintain population viability or a more active intervention needed?; Which management strategy offers the greatest chances for facilitating the survival of the population?; What may be the consequences on the population of particular human-induced environmental changes on the habitat? Plant conservation efforts have previously focused on areas where there are a high number of different species, known as high species richness. However, biodiversity is defined by not just the number of species but also the difference between them. In particular, the genetic variation between species and the evolutionary novelty they provide is now recognized as an increasingly important element of biodiversity.

Public awareness and working with people are an important part of conservation. It is vital to understand the cultural values of the people of an area or region where conservation projects are to take place. To assume that people will accept a project on their land or change their ways in order to save a rare species of plant or animal is foolhardy. It is very difficult to change people's behaviour especially in developing countries where areas to be marked for conservation may be used as pastures or rangelands. To bring any kind of change, it is most important to make those concerned aware of what is happening, to educate them regarding the value of the project, and to involve them in the project as mush as possible. There is little hope for any conservation project to be successful where project managers are aloof to the needs and behaviour of the local people. Far too often, developing countries are bombarded with "need for conservation" by "consultants" who have none or little knowledge of the local people and do not involve them in

any education programme for the project. If the knowledge of the local people and their behaviour are respected and understood, and their involvement is attained as part of a conservation project, there is more hope for the objectives of the project to be achieved.

In the Sultanate of Oman, the first survey for setting up areas of conservation was carried out in 1986 in a joint project between the IUCN and the government of Oman (Clarke, 1986),which involved the survey of the entire country, assessing the biological richness, and outlining areas of species richness or where rare species were found, and areas under most threat. The information was then used to suggest areas for conservation, such as nature reserves and areas of scenic beauty. The report proposed a total of 91 nature reserves dispersed throughout the country, covering about 40% of the land surface of Oman. The work was carried out by experts as no expertise was then available in Oman (local or otherwise). Of the 91 proposed conservation areas, 59 were National Nature Reserves, 20 National Scenic Reserves, and 12 National Resource Reserves. During the following 2 decades more and more data were added to the baseline data with detailed EIAs of various areas (Ghazanfer, 1991, 1993, 1996a, 1996b; Ghazanfer & Rappenhöner, 1994; Duling et al., 1998). The country's plant red list was prepared in 1998 (Ghazanfar, 1998), which also outlined the habitats that were regarded to be under threat, and conservation measures to be taken to conserve these.

Of the sites recommended by Clarke (1986) and later studies, 1 National Park and 3 Nature Reserves have been declared (Fisher et al., 1998; IUCN, WCPA, 2003). The Arabian Oryx Sanctuary (in central Oman) was gazetted as a World Heritage Site in 1994 because of the unique desert ecosystem whose diverse flora includes several endemic plants, and it was the only wild breeding site in Arabia of the endangered houbara bustard; a species of wader, Nubian ibex, Arabian wolves, honey badgers, caracals, and the largest wild population of Arabian gazelle are also found in the site. Its rare fauna includes the first free-ranging herd of Arabian oryx since the global extinction of the species in the wild in 1972 and its reintroduction there in 1982. In 1996, the population of the Arabian Oryx in the site was 450 but it has since dwindled to 65 with only about 4 breeding pairs making its future viability uncertain (IUCN, 2007). This decline is due to poaching and habitat degradation. The site was delisted in 2007, because of Oman's decision to reduce the size of the protected area by 90%, and plans to proceed with hydrocarbon prospection, which was in contravention of the Operational Guidelines of the Convention on World Heritage Sites.

The Arabian Oryx Sanctuary in the central desert of Oman (Jiddat al Harasis) is a classic example where development is deemed essential and necessary for the economy and well being of the country; it is also a sad example where public awareness through education and the value of local cultural values were ignored resulting in poaching and extensive habitat degradation.

GSPC targets 4 and 5

In most developing countries, GPSC targets 4 and 5, i.e. promoting education and awareness, and building capacity for the conservation of plant diversity are most important. Although base line data can be collected by experts, to put into practice and to make a project successful, local participation is still necessary. For the continuity and further development of any project, building the capacity of local people is as important. Education is important, both informal and formal, at all levels, for policy-makers and for the public in general. It is also crucial that specific indicators are developed to monitor progress towards the achievement of programmes and education about plant conservation is included in education policies (GSPC, 2002).

If a country has to achieve any of the GSPC targets, considerable capacity building has to be achieved. In addition to training programmes, adequate technological, institutional, and financial resources have to be built in projects and conservation programmes. Capacity building has to be based on national needs, which is likely to be considerable in developing countries.

Summary

The conservation of species and habitats is complicated and involves several steps. Most conservation projects require baseline data that are essential; this may or may not be available or can be collected by local experts. If local expertise is not available then consultants (foreign experts) have to be involved. The consultants must work with local people and train them. Involvement of the local people and their awareness and education will not only get the project off the ground in a positive manner but also will give it constancy and continuity in time to come.

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