

## 12. Conservation and Rural Development: Towards an Integrated Approach

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### Summary

*The overall goal of rural development programmes should be the reduction of poverty, unemployment, malnutrition and inequity, and an integral part of all these programmes is the introduction of a positive rural land-use strategy, which recognizes the prime importance of food production, but at the same time safeguards soil and representative areas of natural ecosystems. The goal of the World Conservation Strategy is the integration of conservation and development so that we may all have a way of life which is sustainable. However, it is becoming increasingly difficult to sustain legitimate human demands because high rates of human population growth, coupled with a high rate of world economic growth are threatening the four basic biological systems that support the global economy, the grasslands, fisheries, croplands and forests.*

*This paper gives an outline of how these systems are threatened, with emphasis on the relationship between rural development, as defined by the World Conservation Strategy, conservation and environmental degradation. The importance of determining felt needs and aspirations in designing both conservation and rural development activities is discussed, with particular reference to the advantages and disadvantages of traditional life-styles.*

### Introduction

In most Third World countries, poverty and all the problems associated with it tend to be concentrated in rural communities. Urban poverty is all too often exacerbated by rural-to-urban migration, and thus it is logical to view it as a derivative of rural poverty. For reasons that will be described later, rural development is one of the most difficult problems facing a developing nation.

For the purpose of this presentation, it is assumed that the overall goal of rural development programmes is the reduction of poverty, unemployment, malnutrition and inequality, and that an integral part of all these programmes is the introduction of a positive rural land-use

strategy which recognizes the prime importance of food production, but at the same time safeguards soil and representative areas of natural ecosystems.

It is perhaps inevitable that hungry and very poor people who live in a situation of rural poverty next to a well-protected wildlife sanctuary will have no enthusiasm for traditional nature conservation, mainly because they believe that the interest of wildlife is being put before that of human beings. In their eyes, poverty, disease and malnutrition are the priority concerns, and the apparent excessive concern for wildlife is regarded as incongruous and unbalanced. When a conflict arises between conservation and legitimate human demands for rural development, and politicians like Professor Emil Salim are asked to justify the retention of designated wildlife areas, a conservation philosophy must be readily available that will satisfy the most demanding critic who is surrounded by absolute rural poverty.

Unfortunately, far too many people still look upon conservation activities as being solely concerned with the 'preservation' of large and spectacular mammals, for either aesthetic reasons or for the benefit of foreign tourists. Under such circumstances, it is hardly surprising if 'traditional' conservation values receive little support. The *World Conservation Strategy* is an attempt to change such attitudes. Following the Strategy, conservation is defined as the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. In other words, conservation goes far beyond 'preservation', and includes sustainable utilization and the enhancement of the natural environment. Above all, this new philosophy emphasizes a positive linking of conservation and development. The goal of the *World Conservation Strategy* is the *integration* of conservation and development so that we may all

have a way of life that is sustainable, and if pursued realistically, conservation goals and rural development goals should be totally compatible—hence the title of this presentation.

### The Link between Environmental Degradation and Poverty

Lester Brown, the Director of the Worldwatch Institute in Washington, has stated repeatedly that, at some point, environmental deterioration translates into economic decline and ultimately, social disintegration. Policy-makers, conservationists, and rural development planners can no longer afford to dismiss the link between environmental deterioration and economic stress. Quite clearly, as a consequence of a combination of high rates of population growth, coupled with a high rate of world economic growth, the basic biological systems that support the global economy—grasslands, fisheries, croplands and forests—can no longer sustain legitimate human demands, that is, if we persist with the present ways in which we use and abuse these systems.

Projections for human population growth give us no cause for optimism. From a 1980 total of 4.433 billion, UN experts expect the world to reach over 6.100 billion by the year 2000. On a regional basis, Africa will have the highest rate of growth over the same 20 year period—81%. The inertia of this growth is built into the population's age distribution, and will carry it forward well into the next century. A world population exceeding nine billion by 2050 would be a plausible forecast. Africa's high rate of growth demonstrates how powerful this momentum can be. For example, Nigeria's present population of 85 million is projected to reach 425 million before leveling off—almost as many people as now inhabit all of Africa.

How does this high rate of growth influence the four basic biological systems that support the global economy? Briefly, as Lester Brown has repeatedly emphasized, these are threatened as follows:

#### 1. Grasslands

In nearly every region of the world, the area covered by grasses exceeds arable land. There are approximately 2.5 billion hectares of grassland, supporting 2.7 billion domesticated ruminants, and these animals play an indispensable role in the world economy. Ruminants are uniquely adapted to digest roughage and to convert it into meat, milk, cheese, butter, wool, leather and tallow. In addition, grasslands provide 'fuel' for

cultivating one third of the world's cropland that is tilled by draft animals.

Unfortunately, the world is full of examples of serious grassland degradation leading ultimately to desert formation. Approximately six million hectares per year are becoming desert-like, and this change is being accelerated by the unsustainable and destructive practice of cultivating steep hillsides with primitive subsistence agriculture techniques and also by deforestation. So many traditional life-styles regard cattle as a source of wealth, and there is an extreme reluctance to de-stock. Environmental degradation coupled with declining livestock productivity is the inevitable consequence of overstocking, and sustainable utilization becomes an impossibility.

#### 2. Fisheries

Some over-optimistic and unsubstantiated claims have been made recently about the role of the fishing industry as a possible solution to world food shortages. From 1950 to 1970, the world fish catch more than trebled from 21 to 70 million tons, the increased catch yielding about 18 kg per person per year. However, since 1970 it has fluctuated about that level, and has even started to decline, and there is every reason to believe that this decline will continue until the end of this century. This example, like that of man's use of grasslands, shows that the production of food cannot continue to increase for ever, and that any biological system, whether it be on the land, or in the sea, must eventually conform to biological constraints.

#### 3. Croplands

The croplands of the world, and the soil associated with them that we take so much for granted, are being seriously threatened by soil erosion, increasing salinization of irrigated land, loss of land to urban development, and ever-accelerating losses through desertification. For example, in Egypt, where only 4% of the land is arable, 285 000 hectares of the best cropland have been lost to urban development in the past 10 years, which represents 8.5% of Egypt's total agricultural land, and this in a country where one million Egyptians are born every 10 months.

Many traditional life-styles are associated with shifting cultivation, a system in which a family will move into an area, cut down trees and clear the land for cultivation, and use the soil until its fertility is exhausted. They will then move on to a new area and repeat the process, leaving the exploited land for 30 years or more to recover. Such a way of life is sustainable as long as there are still new places left to move to, but in most

developing countries the rate of population growth is such that shifting cultivation is no longer a realistic form of land use—in simple terms, there is nowhere left to move to. Shifting cultivation is a destructive cropping practice, but with a traditional life-style in which people moved, soil and vegetation had an opportunity to recover. When people can no longer move, but continue to employ the same agricultural techniques in the same place year after year, a totally unacceptable rate of soil loss is inevitable.

Soil erosion is, of course, a natural process, that occurs even on land that is well grassed or covered by forests, but soil itself is also being *formed* continuously, normally at a rate of between 2–5 tons per acre per year. When the rate of soil loss exceeds the rate of soil genesis, the topsoil thins, and eventually disappears, leaving only subsoil or even bare rock. Serious soil losses of this nature are one of the main reasons why the croplands of the world are one of the most threatened of the basic biological systems, and provide an excellent example of the link between environmental deterioration, economic stress and social disintegration. Africa's inability to feed itself demonstrates this point. Between 80–90% of the nearly 400 million people living in sub-Saharan Africa live in rural areas. Most survive on an annual per capita income of less than US\$150. The per acre yield of many subsistence food crops appears to have stagnated, or even declined, and if present trends continue, Africa will increase its dependence on food imports. In Central Africa, a calamitous drop in food production is projected. The quantity of food available will simply be insufficient to permit children to reach normal body weight and intelligence.

#### 4. Forests

In less developed countries, wood is used by up to 90% of the population for heating, cooking and building, and there are already many places in the world where people are finding it very difficult to cook their food and obtain raw material for building purposes. If present trends of wood use continue, by 2020 virtually all of the physically accessible forests in the less developed countries are expected to have been cut down.

There is much more to this than a loss of raw material for energy and for building. Deforestation destroys well-established water cycles, leading to siltation of streams and river, depletion of ground water, intensified flooding, and an aggravation of water shortages during dry periods. This relationship between forests and water is extremely complex, but perhaps of most immediate significance to rural people is the

relationship between deforestation and the increase in dirty and insufficient water and inadequate sanitation. Between 10 million and 25 million people die each year in the world from diseases caused by or aggravated by unclean or inadequate water supplies. In fact, the World Health Organization estimates that as much as 80% of all sicknesses may be due to these causes.

#### Rural Development and the World Conservation Strategy

The lesson for developing countries from these examples of environmental degradation must be obvious. Unless rural development programmes can be designed and implemented to meet the needs and aspirations of the people who live in the rural areas, rural-to-urban migration will accelerate. The effect of this migration will be to sap the rural areas of their vitality and strength, leaving them leached and barren, the repositories of struggling mothers, of the old, the sick, the young and the tired. Rural development, one of the most difficult problems facing any developing country, is thus in the hands of those who are least capable of dealing with it. The longer the rural areas are neglected, the more environmental degradation will increase, with ecological and economic consequences extending far beyond the present rural areas themselves.

Few would deny that there is an urgent need for rural development, with a priority being given to food production and the introduction of a way of life that is sustainable. However, rural development activities must be linked to a realistic philosophy for conservation as set out in the *World Conservation Strategy*, and a hungry man in a situation of rural poverty must be convinced that the goals of rural development and the goals of conservation are most definitely compatible. For this to succeed, the three objectives for living resource conservation according to the *World Conservation Strategy* will have to be presented in an acceptable and comprehensible form that is related to the felt needs and aspirations of each individual community. The three objectives are:

- (1) to maintain essential ecological processes and life-support systems;
- (2) to preserve genetic diversity;
- (3) to ensure the sustainable utilization of species and ecosystems.

If conservation is 'packaged' according to these three objectives, then there is good reason to believe that it can be integrated into rural development.

In developing countries, where new lands are being opened up for food production, and simultaneously demands are being made to set aside land for nature conservation, politicians face a real dilemma that can only be resolved through a systematic *land capability analysis*, and this is the approach that is being used by the Institute of Natural Resources in KwaZulu. Such an analysis is based on up-to-date survey on the quantity, quality and distribution of relevant natural resources, including soil, climate, water resources, existing land use, land ownership, fauna, flora and human populations. From these data, derived maps have been produced for a part of KwaZulu showing lands of high potential for dryland crop production, irrigation, afforestation, grazing by domestic animals, and nature reserves, and it is also possible to identify those areas where the use of indigenous fauna and flora on a sustained-yield basis is the optimum form of land use. Certain areas have an obviously high potential for food production, and they will have to be used accordingly. Similarly, other areas have an obvious potential for planting of exotic trees for timber, and would be unsuitable for growing food.

By the same standard, when an area is identified as either a nature reserve or as a place where naturally occurring plants and animals can be used by man on a sustained-yield basis, this implies that a systematic analysis has indicated that for a variety of reasons these areas would be unsuitable for food production from introduced cultivated plants or from domesticated animals. Two recent Institute projects elsewhere in KwaZulu have demonstrated the importance of using indigenous species as the optimum form of land use. In one project, *Acacia tortilis* was investigated as a source of food for livestock in impoverished, overstocked Valley Bushveld during the winter months, and in another an investigation is being carried out on the use of indigenous fish on a sustained-yield basis from naturally occurring pans as the best way to use and develop the Pongolo floodplain. The latter is one example where a traditional life-style is still sustainable in the 1980s and is, in fact, still the best way to use the area concerned (Fig. 12.1).

A land capability analysis as conducted in KwaZulu can go a long way towards reducing a conflict between nature conservation and food production, because these areas identified for the former category would probably make only a marginal contribution to food production. The conflict arises when arable land of high potential is incorporated into a nature reserve, as must inevitably happen if developing countries are to

retain representative examples of plant and animal communities and ecosystems in a reasonably undisturbed state. Although these protected areas need not be relatively large in relation to existing arable land, to a land-hungry individual they will inevitably appear to be substantial, and a great deal of diplomacy, tact, initiative and thought will have to be assembled in an attempt to justify the land being 'sacrificed' for the protection of plants and animals.

No one answer to such a conflict can ever be devised to suit all individuals in all countries; the approach will depend on national goals, biological characteristics of the protected area, local socio-economic conditions, and above all, on the objectives of the 'sacrificed' area. However, politicians can stress that they are committed to a *positive rural land-use strategy*, which recognizes the prime importance of food production, but at the same time safeguards soil and representative areas of natural ecosystems. Accordingly, they can point out that if land is ploughed up to grow crops, it is being committed in a way which is probably not reversible; species and communities would be removed and might never return. The role of the 'life-support systems' in these natural areas requires continual emphasis, concentrating on the more 'visible' services such as soil formation, the maintenance of water cycles and the reduction of flash floods, the pollination of crops, and the control of pests.

Two objectives of conservation are covered by this integrated approach, namely, the maintenance of essential ecological processes and life-support systems, and the sustainable utilization of species and ecosystems. The third objective, the preservation of genetic diversity, is a much more difficult concept to put across to relatively unsophisticated people, and yet it is nevertheless a very important one if conservation and rural development are to be integrated.

An immediate problem is that there are unlikely to be *any* short-term benefits to local people whatsoever in terms of preserving genetic diversity, and education programmes are going to have to stress the likely long-term benefits.

The preservation of genetic diversity for future agricultural use should be an acceptable starting point for any education programme. For example, nearly all cultivated plants are being strengthened for continued human use by cross-breeding with wild relatives, resulting in improved durability, yield, nutritional quality and disease resistance. Farmers must be made to understand that they cannot afford to be without a reservoir of still-evolving possibilities, because they have no idea what varieties may be of use to them in the



Fig. 12.1. In Maputaland, Natal, traditional communal *fonya* fishing drives are still practised by thousands of local people. During the recent drought when crops failed, tons of fish were consumed every day by the floodplain inhabitants, at no financial cost. (Photo credit: Clive Walker.)

future as climates alter, soils vary, and consumer demands change.

In addition to the direct use of varieties of plants and animals for food, there are many other examples where a group of closely related species can be of benefit to man. There is no better example than the dung beetles of Australia, where the 200 species of native dung beetles evolved to cope with the dry droppings of marsupials. The droppings of Australia's 20 million cattle were not touched by indigenous dung beetles, and as a result an estimated 1 million hectares of pasture (half the area of Wales) were becoming useless each year because they remained covered by dried out dung. The introduction of 55 species of dung beetles which eat and bury cattle dung have helped solve the problem, with the additional benefits of removing the habitat in which bushflies breed, and recycling the nutrients in the dung.

Another important justification for the preservation of genetic diversity is the provision of resources for health. Although only a few of the world's plants and animals have been investigated for their value as medicines and other pharmaceutical products, modern medicine depends heavily on them. For example, more than 40% of the prescriptions each year in the USA contain a drug of natural origin. More than 85% of the prescriptions for cardiovascular drugs contain derivatives of just two tropical plant genera. In the USA alone, the value of medicines just from higher plants, is reported to be about US\$3000 million a year and rising. We simply have no idea of the way in which vanishing and apparently insignificant species can suddenly become important to us, and it should thus be self-evident that our options for future selection will be greatly enhanced if a high species diversity is maintained.

The aesthetic arguments in favour of preserving genetic diversity must also be considered. Natural habitats represent undisturbed examples of the range of variation in the world's ecosystems, and are attractive and stimulating to look at and watch. Particular species and habitat types have provided inspiration for sculptures, paintings, literature and music. Consequently, the greater the species and habitat diversity of an area, the more likely it is to be attractive and aesthetically pleasing to people. An additional consideration is that wilderness areas can act to release the stress gained from living in a modern society, probably because they offer a complete alternative to urban surroundings and thus allow one to stand back and put urban society in perspective. Furthermore, certain species of plants and animals have for generations been of symbolic significance to many

traditional life-styles, and the loss of such species would be a severe blow to national or tribal prestige.

Finally, there are the issues of moral principle related to the preservation of genetic diversity. An estimated 25 000 plant species and more than a thousand vertebrate species and subspecies are threatened with extinction. Ethical and moral justifications for the preservation of genetic diversity are impossible to quantify, but they are important arguments that cannot be ignored.

### The Significance of Wildlife Sanctuaries to Rural People

How can wildlife sanctuaries, in particular National Parks, be of relevance to people who live in an increasingly degraded rural environment? It is difficult to give a globally acceptable answer, because so much depends on the management objectives of the Park. In simple terms, the primary objective of most National Parks is to preserve in perpetuity representative examples of the plant and animal communities of that country or region. The secondary objective is usually to allow the use of the area by current and future generations of man for inspiration, education and research, provided such use is consistent with the achievement of the primary objective and avoids conflict between the interests of these different forms of use. In certain cases, the secondary objective might also include a limited amount of hunting and gathering by local people, but this is a very delicate issue that requires strict control if the primary objective is to be retained.

The majority of the World's National Parks remain as inviolate sanctuaries, and the more obvious direct gain for people living in surrounding areas is usually restricted to income from tourism. Less obvious, of course, are the direct and indirect benefits from the 'life-supporting systems' that have already been described.

The tourism and money-earning argument for nature conservation can become very counter-productive if there is no legislative, political and administrative insurance that the income derived from tourism will be channelled back into the region in such a way that the people living there will be able to comprehend and realize this benefit in one way or another, in contrast to the State or hotel agents getting most of the income. Local district administrations can prevent revenue going to a central source by establishing reserves on their own land and deriving *all* benefits from them.

The ideal form of development is to have a National Park surrounded by a 'buffer zone',

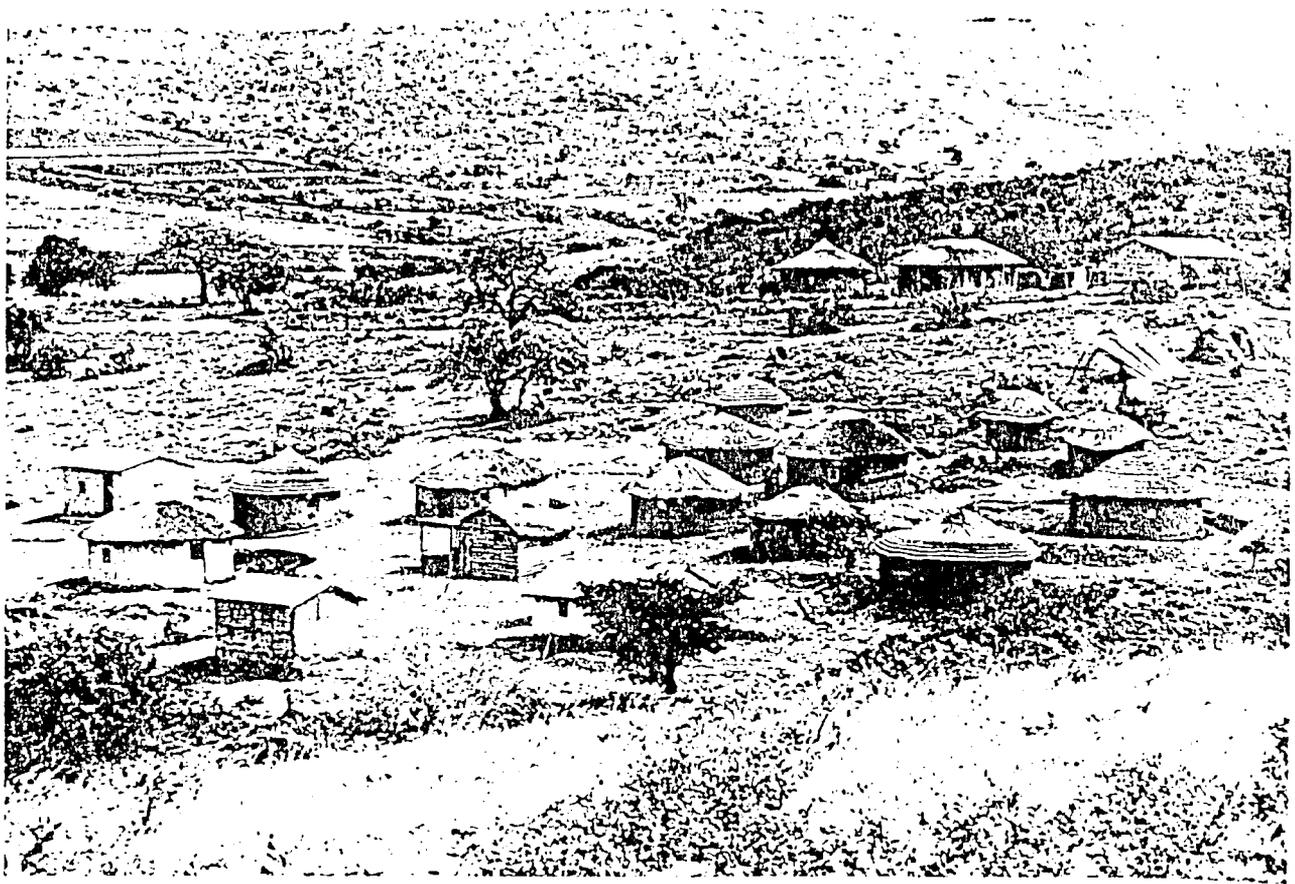


Fig. 12.2. The integration of conservation with development is unlikely to succeed without a consideration of the human factor. In a rural African community like this, a National Park is usually perceived as remote and inaccessible, and irrelevant to the felt needs and aspirations of the local people. (Photo credit: J. Taylor.)

where various degrees of hunting and gathering are totally accepted. Such 'buffer zones' should also contain the major installations, such as lodges and campsites, which would not only directly benefit local people, but would also relieve the pressure on the Park itself. In addition, with tourism being centred in the 'buffer zone', local markets would be opened up for agricultural products, labour and handicraft.

To gain the full support of local people, it must be demonstrated that a National Park can provide more benefits than shifting agriculture and forest product harvesting. A good example of this comes from Amboseli, where the total park net return amounts to US\$40 per hectare compared to 80 cents per hectare under the most optimistic agricultural return.

An *essential prerequisite* for any programme that links conservation with development which promotes the preservation of an isolated sanctuary or a National Park, is a consideration of the human factor (Fig. 12.2). Unfortunately, many conservation plans have failed because they have

been done *for* the people rather than *with* the people. Furthermore, all too often conservation policies have been introduced in developing countries which mimic those of the developed world, and these are usually ill-suited to local conditions and social needs.

The message for conservationists should be obvious. Unless a sincere attempt is made to accommodate felt needs and aspirations of the local people in designing both conservation and rural development activities, the programmes will not succeed, and the designated wildlife sanctuaries will become increasingly insecure.

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