

SOME CAUSES AND STRATEGIES PERTAINING TO LAND DEGRADATION IN SOUTHERN AFRICA

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"The greatest damage that humans inflict on the Earth – and, by implication, the greatest threat that humanity poses to its own future survival – is through the practice of agriculture" (Yeld 1997:48).

1. INTRODUCTION: THE PROBLEM OF LAND DEGRADATION IN SOUTHERN AFRICA

Over the past decade or more there has been growing recognition of the fact that the economic fortunes of many developing countries are inextricably bound to the state of their natural environments, and particularly to the quality and quantity of soil, water and biomass resources. Overuse of these resources combined with only limited appreciation of their complete interdependence, has resulted in depletion of what are in essence non-renewable resources, with land (particularly fertile topsoil) being probably the most important category from the viewpoint of rural communities. In recent times the planet has lost at least 25 billion tonnes of topsoil, or enough, in principle, to grow nine million tonnes of grain and thus to make up the diets of at least 200 million undernourished people (Myers, 1998:25). In South Africa an estimated three tonnes of topsoil per hectare are being lost annually – far higher than the rate of topsoil formation, which is put at 0,1 tonne per hectare per year (Yeld, 1997:35-36).

There is no doubt that the southern African region as a whole is faced with serious environmental problems and land degradation in particular. Huge areas of the region's natural terrestrial ecosystems have already been destroyed and replaced with artificial agricultural systems, greatly reducing or even nullifying the ability of the land to control and influence its own climate and chemistry. As a result some scientists consider southern Africa to be one of the most human-modified regions on the planet (Yeld, 1997:48). The reduction in arable land has taken place as a result of factors such as climatic

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conditions and human impact - the latter playing a major role in the problem. The inevitable results are soil erosion, water pollution and reduced water supplies, deforestation, desertification and other biomass loss and diversion. If it is considered that some seven out of every ten people in sub-Saharan Africa are employed in the agricultural sector, then the impact of the problem really points at an alarming scenario (see Dickenson, Gould, Clarke & Mather, 1996:86). The extent of this problem extends to national and regional economies through reduced agricultural yields, added impetus to rural-urban migration, poverty, food scarcity resulting in malnutrition, diseases and ultimately famine with staggering loss of human life. In addition, drought has aggravated the economic crisis that almost all southern African countries are experiencing. This situation, amongst others, holds serious implications for sustainability in the agricultural sector - and in particular for food security - in the region.

Environmental degradation in Africa, like elsewhere in the world, can be traced to human activity and is therefore, amongst others, related to the issue of human population pressure. Over the past four or five decades, ever-growing human and animal populations have increasingly come to threaten agriculture and livestock practices all over Africa, and particularly the sub-continent. Over-cultivation and over-grazing have reduced the productivity of land. The widespread destruction of tree and vegetation cover for fuel wood (encouraged by the high prices of petroleum-based fuel) and for construction has accelerated the process of land degradation. Poor water management and salinisation of irrigation systems have also left their mark. The over-use and mismanagement of natural resources, and more particularly, of land and its resources, have resulted in soil erosion and desertification, and consequently, the deterioration of the soil base which again threatens the region's natural capital.

It is a point beyond debate that the entire southern African region is faced with the problem of misuse and mismanagement of land resources, which has seemingly hindered economic development. In a desperate attempt to bring about rapid improvement in the quality of life of their people, many developing countries have to launch ambitious, quickly conceived, economic development programmes, with an inherent capacity for environmental degradation. Most disturbingly, sub-Saharan Africa's capacity to feed its growing human population has been decreasing steadily, partly as a result of ill-considered economic and development practices on the one hand, and, accelerating land degradation on the other. In fact, the region is now worse off nutritionally than two or three decades ago, despite the fact that the world as

a whole has made significant progress in increasing food supplies (Sadik, 1998:8 and Menza & Lupien, 1998:163).

Against the above background, this article outlines some of the social causes of land resource degradation in southern Africa and also how changes in policy can redirect development towards more sustainable practices. Specific strategies for addressing the problem of land degradation and the possible role of extension officers in such an endeavour will also be outlined.

2. CAUSES OF LAND DEGRADATION IN SOUTHERN AFRICA

Today it is recognised and well acknowledged that the entire southern African region³, as well as the rest of the developing world, is facing considerable difficulties as a result of endemic land depletion which jeopardises all efforts aimed at development, and especially those aimed at achieving the priority objective of food self-sufficiency and food security. Several studies have revealed that the African continent faces a series of interconnected economic and environmental challenges, which show that development has not thus far been sustainable (see Kakonge & Imvbore, 1994; Morah, 1996 and Yeld, 1997). This situation can be attributed, amongst other things, to rapid population growth, overgrazing, poverty, deforestation, poor farming methods, and, of course, changes in weather and climate which have mostly been facilitated by human activities (Middleton, 1995:99-113).

2.1 Population pressures

It is believed that population growth in developing countries has accounted for 72% of the expansion of arable lands and 69% of the increase in livestock numbers during 1961-1985, leading to desertification, soil erosion, deforestation and deterioration of many natural environments (Myers, 1998:26). Unchecked human population growth has thus, in all probability, become the most threatening factor to the environment in southern Africa. Demographically, the region is characterised by rapid growth rates and high fertility rates. The total population of the region was estimated at 125,1 million in 1995 (Morah, 1995:42), with an annual growth rate of approximately 3% - the fastest population growth rate in human history for any world region (Booth, McCullum, Mpinga & Mukute, 1994:1). The populations of all countries in southern Africa grow at rates of more than 2,1% per year. Zambia

³ *Countries in the sub-region have been arbitrarily defined to include Botswana, South Africa, Swaziland, Namibia, Zimbabwe, Lesotho, Zambia, Malawi, Angola, Mocambique, Madagascar, Mauritius and Seychelles, corresponding to the countries covered by the UNFPA Country Support Team based in Harare.*

and Tanzania top the list with annual growth rates of 3,8%, while South Africa registers the lowest annual growth rate of 2,2%. At this rate, it is projected that the region's population will double by the year 2018. If this is to be the case, then the current environmental problems in the region will be multiplied over the next two decades.

In many parts of southern Africa population pressures have forced people to expand into marginal land – marginal in respect of soil quality, terrain slope and rainfall – because of a decrease in cultivable land. Thus, newly cultivated lands are at high-risk in the long run for rain-fed agricultural activities – high risk as measured by soil fertility, reduced fallow time and their susceptibility to the adverse effects of prolonged droughts. As Omara-Ojungu puts it: “Where land shortage is a problem, land fragmentation poses the drawback to agricultural productivity” (1992:59). The relationship between drought, environmental deterioration and agricultural stagnation is too often ignored in the formulation of development strategies. This clearly indicates that growing human numbers increase the pressure on available resources – a situation that is bound to result in accelerated soil erosion, veld deterioration, as well as increased air and water pollution levels. Kakonge & Imvobore (1994:4) echo this argument by stressing that “...it is projected that unless high population growth rates in many parts of Africa are controlled, they will lead to depletion of natural resources and to wider environmental damages”.

There is yet another factor closely connected to population pressures and environmental degradation, namely political instability. Political instability has caused some serious environmental problems in southern Africa. Countries like Mozambique and Angola have been plagued with civil wars for a considerable length of time, and this has meant the displacement of citizens and concentration of populations in one area, resulting in deforestation of lands, overgrazing and soil erosion. Over the past twenty years, large areas of Angola, Zambia and Mozambique have been deforested to provide arable land or settlement for displaced populations. In Zambia, 13% of farmland is severely eroded. The International Institute of Applied Systems Analysis (IIASA) reports that in Zimbabwe the extent of the cultivated area and the intensity with which it is farmed or grazed means that 10% of communal land is “very seriously eroded” and less than 60% is still in good condition (Ramphela & MacDowell, 1991:172). Land degradation is so serious that already hard-pressed communal lands face hunger and even starvation. This, in fact, might well be a contributing factor to the illegal occupation of (white) commercial farms by hundreds of (black) small farmers in February/March 2000.

Land degradation in the sub-continent is aggravated by the fact that Africa is the only region where food production has singly failed to increase with its explosive population growth. Official figures suggest that Africa suffered a continuous decline in food production since the mid- 1970s. By 1988 the deficit was some 16% compared with 1970 (Dickenson *et al.*, 1996:109). Africa's food-deficit is expected to rise to 50 million tonnes this year (2000) and to 250 million tonnes by 2020 (Myers, 1998:18). Already, one in every three persons on the continent is malnourished.

2.2 Deforestation

Deforestation in southern Africa is primarily the consequence of human population growth which leads to expanded needs for crop and grazing land. Kalipeni explains: "Southern Africa's varied landscapes, which include tropical forests, savannah grassland and desert are encountering a range of environmental problems that stem from ever-increasing human pressure for more land" (Kalipeni, 1994:4). Forests are also being cleared or degraded by local people in search of timber, fuel (charcoal and firewood) and many other products. The high rates of poverty are also contributing directly to this degradation. For example, the widespread dependence of the poor on firewood for domestic fuel, as the only source of energy for cooking and heating, has led to a massive cutting of forests.

Forests are being depleted at a disturbing rate due to the encroachment of farm settlements upon forestland. Forests and woodlands also supply browse and pasture for livestock, but as in the case of fuel-wood collection, more intensive exploitation has led to overuse and depletion of forest resources, particularly in regions of lower rainfall. Eventually this has both a triggering and exacerbating influence on soil erosion. Conventional wisdom favours explaining erosion as a response to increasing pressure on the land brought about by the growing world population and the abandonment of large areas of formerly productive land as a result of salinisation and alkalinisation. In support of this, the UNDP's Human Development Report (1998:73) indicates that population growth has always been identified as the driving force behind soil degradation. Research studies reveal that the problem is severest in Asia and Africa.

The combined effects of soil exhaustion and erosion from non-sustainable agricultural practices and from encroachment upon forest areas, fuel-wood harvesting and grazing have resulted in the severe desertification of the region's arid and semi-arid lands. In South Africa, desertification has already affected 250 000 hectares and approximately 55% of the country is in danger of

desertification (Hugo, Viljoen & Meeuwis, 1997:133). In Botswana and Namibia, cattle and sheep ranches have expanded into marginal areas on the desert fringes, exposing vast areas that already had only sparse grass cover (Booth *et al.*, 1994:9). In Malawi, the lush forests and woodland in the countryside have disappeared, leaving barren, infertile fields in their stead (Kalipeni, 1994:6). Morah (1993:56) also points out that in Tanzania, firewood has become so scarce that each household spends 250-300 working days per year simply for gathering its wood supply. This really demonstrates a disturbing trend in land degradation due to unsustainable patterns of living.

2.3 Poverty

All over the world a swelling number of poor and landless people are putting unprecedented pressure on the natural resource base as they struggle to survive. In fact, poor people and environmental degradation are often caught up in a downward spiral. Poor people are forced to deplete resources to survive - including the agricultural resource base - and this degradation of the environment further impoverishes people. When this self-reinforcing downward spiral becomes extreme, poor people are forced to move in increasing numbers onto ecologically fragile lands.

Conditions of widespread poverty have caused serious environmental deterioration in several developing countries. On the one hand, these countries suffer poverty-induced degradation patterns of their natural resources of land, water and forests. On the other hand, to achieve rapid improvements in the quality of the lives of their people, they have to launch ambitious, quickly conceived, economic development programmes with an inherent capacity for environmental degradation. Widespread malnutrition makes a rapid and substantial increase in food production imperative and urgent in many poor countries. The task of producing enough food, however, has become almost impossible in the light of the fact that the resource base in the region is being eroded as a result of desertification, soil erosion, salinisation, deforestation and simply by the mounting pressures of settlements development.

It often happens that agricultural production is accelerated to meet the demands of the growing population, but this usually happens at the cost of soil cover and fertility which in turn results in declining agricultural productivity. This therefore suggests that large numbers of rural populations that rely heavily on agriculture are likely to experience food shortages that could perhaps result in hunger and starvation. The poorest of the poor are thus often the main cause of environmental degradation in their desperate

pursuit of methods of survival. Because of their grave situation, they cannot even begin to think about conservation measures. Consequently, as stated earlier, food production has been on the decline in all countries of the region. Morah (1993:59) explains the inevitable result: "The incidence of malnutrition has been on the increase on the average. Food consumption in the sub-region is 80-85% of the recommended requirements for healthy living".

The Human Development Index (measured in terms of a decent standard of living, life expectancy and educational attainment and adjusted income) in southern Africa is considered low, reflecting the stark presence of poverty in the region. Statistics on the number of people in absolute poverty - those unable to meet essential needs - according to figures available from Botswana, Lesotho, Malawi, Namibia and South Africa, range from 49-78% (Booth *et al.*, 1994:6). The figures also indicate that less than half of the population in the region has access to clean water, health facilities and sanitation. This clearly indicates that while economic growth is necessary to improve incomes, it is also critical that poverty be alleviated. In other words, a fairer distribution of wealth is also needed. Until poverty is reduced, population growth and pressure on resources will continue to increase. Government priorities and limited resources will have to focus on basic human needs until the level of available resources allows for improved environmental management.

Almost half the world's poorest people, more than 500 million of them, live on marginal lands (UNDP, 1998:66). While human activity may be the immediate cause of land degradation, the root cause seems to lie in a range of economic and political parameters. Since desertification is expected to increase in future, poverty is likely to become more acute as well. Programmes to reduce land degradation will thus not accomplish anything if they fail to address poverty as one of the causes.

2.4 Overgrazing

Grazing is the most intensive form of land-use in southern Africa. For many decades pastoralism has been practised over large parts of the region in harmony with the environment, especially in Tanzania. However, with the advent of technological developments such as farm dams and boreholes, more marginal areas have been opened up and over-utilisation of vegetation has crept in (Booth *et al.*, 1994:9).

Overgrazing has contributed significantly to the loss of soil in southern Africa. Today, due to increasing populations and decreased land as a result of coastal erosion brought about by global warming, more land is brought under

cultivation. This suggests a decrease in the land previously available for grazing, forcing pastoralists into smaller, marginal lands. According to the United Nations Environment Programme, overgrazing causes more than half of all soil degradation in the sub-continent (UNEP, 1992). Some of the most extensive examples of serious degradation are found on grazing lands in the central and western parts of South Africa. Although rates of desertification and Karoo encroachment are debatable, it is widely accepted that the long-term productivity of virtually the entire Karoo region has been substantially reduced due to overgrazing. Likewise, the Northern Province bushveld is in the process of becoming desert-land as a result of overgrazing. There are also localised pockets of serious degradation in Angola, in north-eastern Botswana and in central and north-eastern Tanzania (Booth *et al.*, 1994:40). Livestock are said to upset the balance of the southern African ecosystems more than wild animals do. Yet cattle-farming, although still a sign of status in many African communities, is one of the least efficient means of producing protein – a factor that is seldom taken into account in long-term planning (Yeld, 1997:35).

2.5 Poor farming methods

Traditional forms of agriculture have been able to sustain large numbers of people on small areas, using intensive but ecologically sound methods on a sustainable basis. Traditional cropping systems, such as slash and burn shifting cultivation were well adapted to the local ecology and they kept the soil fertility intact. Today, however, with so many people trying to earn a living from the land, this is no longer possible. The traditional methods of farming have been relegated in favour of modern methods. For example, simple inexpensive counter-measures known over the centuries, like the use of terracing, are now often not applied widely enough to prevent soil erosion. At the same time, technology transfers have often not taken root because in their planning, proper account was not taken of local, cultural, educational, economic and ecological conditions.

Southern Africa faces the challenge of increasing food production to keep abreast of a fast-growing population. This is currently being done by bringing forested or grazing lands under cultivation or through intensified irrigated production. Large areas of land have been permanently ruined by standard agricultural techniques and can no longer support grazing. Modern methods, insufficient organic material being returned to the soil and also sheet erosion are fundamental causes of the declining fertility of cultivated lands.

By way of conclusion, it can be said that concern for environmental degradation is an integral aspect of concern for humanity. The destruction of

forests, the loss of arable land, the loss of human productivity through disease and malnutrition and increasing pressures on fragile ecosystems are typical problems of southern Africa most acutely amplified in the poorer sectors of its populations. Although there may be contrasting views on the causes of land degradation, poverty and overpopulation nevertheless appear to be in the forefront. The nature of the population challenge to sustainable rural development in the region is no less important than it is for the entire continent, and for developing countries as a whole.

3. STRATEGIES TO ADDRESS LAND DEGRADATION

Although the concept of sustainability has become widely accepted in southern Africa, non-sustainable land use practices have gradually contributed towards the deterioration of environmental capital in the region. Also, conventional methods of promoting economic development in the region concentrated mainly on economic growth, without paying sufficient attention to the guiding and underlying principles of sustainable living. As a result, a number of general reservations have been voiced from various angles regarding sustainable development in general, and in southern Africa in particular. In addition to what has been pointed out earlier, a number of structural impediments are currently also hampering efforts at sustainable development and are, in fact, actually enhancing the process of land degradation in particular.

Foremost among these is the fact that political instability - especially the civil wars in Angola and Mozambique - has crippled the sub-region and made it virtually impossible for development efforts to be sustainable. Another major issue pertaining to unsustainability in southern Africa is a lack of adequate data. Kakonge & Imvbore (1994:6) point out that it is difficult to give a clear assessment of the areas that are degraded, because there is little data available regarding environmental degradation. There is quite simply a lack of trained personnel and co-ordination within government ministries to collect and analyse data. Nevertheless, evidence has shown that this problem is being addressed urgently in many countries.

A further problem relates to the fact that existing legislative frameworks concerning environmental protection and conservation are inconsistent and outdated. In some cases enforcement is either lacking or inadequate. Kakonge & Imvbore (1994:7) conclude that a sound and workable system of environmental law is an essential precondition for addressing land degradation and achieving sustainable development. It is therefore vital for countries to redefine and enact relevant environmental legislation and to

establish the necessary institutional frameworks for enforcing such legislation which forms an integral part of the promotion of sustainable development.

However, despite initiatives by institutions such as the World Bank and non-government organisations aided financially by foreign agencies, as well as a few environmental action plans for several countries in the region, not much has been done to redress environmental problems in southern Africa due to the above-mentioned implementation problems. The southern African countries nevertheless have many environmental problems in common. Wealth and quality of life in most of these countries are also more or less on a par, and it is assumed that their awareness of the significance of the problem is also at the same level. For these reasons, the following principles and strategies to address land degradation may broadly apply to all countries in the region.

3.1 Improve the quality of life

One of the greatest challenges facing the whole of southern Africa is to provide adequate food for its poorer sectors of the population (especially the rural population), provide health care services, reduce environmental health risk from environmental pollution and hazards, provide education for all children and reduce illiteracy. This will help unleash the potential of so many people and reduce environmental stress. Health and development are intimately inter-linked: Sound development is not possible without a healthy population. To promote a healthy population would require the provision of safe drinking water supply and sanitation, adequate food and proper nutrition in schools. In other words, a well-focussed anti-poverty strategy is one of the basic conditions for addressing land degradation and ensuring sustainable development. An effective strategy for dealing with the problems of poverty should begin by focussing on resources, production and people, enhanced health care and education, and strengthened employment and income generating programmes (UNEP, 1992:31).

The linkage of poverty and environment requires co-ordinated efforts. Such efforts include education, housing, public works and the involvement of community groups (e.g. schools, religious and civic organisations). Particularly important is the notion of 'prevention' rather than relying on remedial actions and treatment. Governments ought to develop plans for priority actions that are based on co-ordinated planning of various levels of governments' ministries, as well as NGOs and local communities.

Past experiences indicate that lack of local participation has contributed to the failure of environmentally-oriented projects in Africa. The local level - the level of the individual community and the locality - is where ecosystems are conserved or destroyed, needs are met or frustrated and ecological, social and economic factors are integrated (Braune, 1992:71). Nyerere (cited in Kakonge & Imvbore, 1994:8) points out that "...if the local people are able to develop, they must have power.... At every stage of development, people do know what their basic needs are.... If they have sufficient freedom, they can be relied upon to determine their own priorities of development and then work for them...". In this sense, Braune (1992:89) adds that the empowerment of communities is essential if individuals are to adopt sustainable lives. This can occur through education and training, an increase in their control of the resources they use, their participation in conservation and development projects, and their influence on decisions that affect them.

At the heart of this principle lies the notion that for any developmental and conservation plan and action, local communities must be involved at all levels of decision-making. In this way, local communities can organise themselves and strengthen and apply their capabilities for taking care of their environment and for satisfying their needs. Local participation should, however, not be confined to those local communities affected by development projects, but also be aimed at important stakeholders such as schools, universities, private enterprises, private voluntary organisations and co-operatives - all of which possess valuable information that can be useful in planning and implementation. It is of particular importance not to underestimate the role and contribution of women in all of this. Fleischer (1996:51) maintains that women are predominantly the financial managers of rural households. For this reason, the challenge is to strengthen the position of women with programmes of service delivery, including the delivery of financial services. In addition, the support given to rural women should build their financial and management capacity through training and monitoring and support programmes. Booth *et al.* (1994:33) point out that for African women to gain the degree of equality commensurate with their responsibility for social well-being and the care of natural resources, will require more than just women-centred aid projects which can sometimes be counter-productive: It will require a transformation from within each society.

The southern African countries should realise that it is rural women who are the direct agents of development since their husbands, in many cases, are migrant labourers. For development efforts to be sustainable, it is vital to appreciate the pivotal role played by women in local level planning. Their full participation is therefore essential to achieve sustainable rural development. It

is thus recommended that ways by which women can be encouraged to participate more fully in environmental management and education be devised and augmented.

3.2 Population development

In the face of persistent land degradation and depletion of natural resources upon which development depends, no strategy is likely to succeed unless policies to slow down population growth are formulated and carefully implemented. Sustainability will not be possible unless human populations and resource demand level off within the carrying capacity of the Earth. The high fertility rates of the sub-Saharan region imply a further increase of pressure on the natural resources base, especially in the rural areas where poverty is acute.

The nature of the population challenge to sustainable rural development in the sub-region is no different than for other African countries, or indeed for developing countries in general. The population parameters constituting the greatest challenge are growth rates, fertility rates, urbanisation and pressure on the environment. The responses of governments in southern Africa to these challenges should include *inter alia* i) promoting and sustaining a greater awareness of the impact of population, gender and the environment on sustainable human development; ii) more systematically integrating population, gender and environmental concerns into development programmes and strategies, and iii) adopting strong population and environmental policies and programmes, including strong family planning programmes and improved access to proper health care services in general. Lass (1995:2) maintains that provision of family planning services alone can indeed never solve the population problem, unless it forms part of a broader strategy which includes – at its base – poverty alleviation, economic empowerment of women and protection of the environment. However, the focus cannot be fixed on women alone to the exclusion of men. Men certainly also need to be empowered to help them find a life outside patriarchy, to take responsibility for their own fertility and to share family responsibility. A reduction in population growth rates should be the first priority of southern African governments towards an integrated approach of sustainable land use.

The conventional policy for slowing population growth is through family planning. Yet, success stories in reducing birth rates are almost invariably tied to an increase in the standard of living. It is generally accepted that the best way to decrease population growth is to reduce poverty and increase standards of living. This, however, does not make family planning less

important. Many factors act together to determine family size. They include access to (and information on) family planning services for both women and men, family income security, maternal and child health care, women's status in society, education for men and women and religious and cultural factors (UNEP, 1992:49). These factors reinforce one another and population stability can be achieved only if action is taken on all of them. In this regard governments will have to take a multi-faceted approach to family planning. People limit family size when it makes sense to them socially and economically. In other words, women are inclined to understand and accept family planning when their education and role in society improve, when men are prepared to accept such changing roles of women and when maternal and child mortality drop.

Family planning has to be incorporated in all rural and urban development programmes and be funded as part of budgets. The rapid expansion of access to family planning services will require strengthening and expanding of public health care systems, as well as developing alternative and supplementary structures. These structures include private family planning organisations, non-governmental health care networks (such as missions, employers' schemes and private practitioners), other governmental groups working in development (such as women's groups and community-based associations), non-health-based government outreach networks (such as agricultural extension workers and community development workers) and the commercial sector (such as pharmacies, rural general stores, and market traders) (World Bank, 1996:72). UNEP (1992:24) adds that primary health care, too, needs to be strengthened in many countries as part of wider social policies. These include the provision of family planning services to bring human populations into a sustainable balance with environmental resources. A significant expansion of family planning services can be made through information, education and communication activities which can be carried through mass media campaigns, talks by health workers, campaigns in schools and workplaces, promotion by outreach workers and religious leaders (World Bank, 1996:71). Commercial sectors and private sectors can also take part in providing information and training. The World Bank suggests that the main objective among the urban and educated groups should be to publicise where to obtain services and to raise awareness of the benefits and risks of different methods. Among the rural, uneducated, and more traditional groups, the aim should be to prepare for the arrival and acceptance of modern family planning services. Research surveys are also necessary to make services more efficient.

The reciprocal relationship between population, environment and development is generally recognised. So also is the fact that the population context in most developing countries and especially Africa not only constitutes serious obstacles to attempts to improve the quality of life of their populations, but is also partly responsible for the declining trends in human development indicators. Governments in southern Africa should take this into a serious consideration and consequently adopt various approaches for mitigating the effects of population on their efforts at reversing the declining trends of human development. They should also lay foundations for achieving sustainable development. Comprehensive and integrative policies should be adopted so as to maintain a balance between population and resources. Commitment to family planning should not only be a health intervention, but it should be incorporated into all rural and urban development programmes. Though we cannot dismiss the fact that all southern African countries share common background factors, strategies should start from the unique situation of each country.

3.3 Conserving the natural resource base

There are no largely-unused resources of cultivable land that can be used for agriculture. Consequently, the land now used for agriculture will have to be utilised more intensively. This holds the potential of degrading it further. Both to improve agricultural productivity and to take the pressure off marginal lands, a land management policy or system has to be implemented to sustain marginal lands. The challenge facing governments is to enable the poor to manage their own lands so as to benefit from increasing agricultural productivity. This can be achieved if it is ensured that local communities are able to participate fully in the planning and implementation of decisions pertaining to land management and conservation.

The poor should be provided with the infrastructure necessary to move beyond subsistence farming and herding - which deplete soil fertility - to a more economically and ecologically sustainable mode of farming. Simonis (1992:78) suggests that the cultivation of non-food crops such as nuts, cocoa, fruits, vines, etc. be encouraged, rather than field crops such as beans, maize, tubers and other traditional crops. It is believed that the first group will hold a promise of raising incomes for the poor and of providing plant cover to the land, thereby preventing further degradation. Rwelamira & Kleynhans (1998:216) maintain that the African Development Study revealed that increased agricultural output in the region depends on moving from an intensive system in the smallholder sector to a greater use of cultivable land for large-scale farming. Some traditional crops can still be grown on a small

scale on marginal lands, but new techniques must be employed to restore soil fertility. The highest priority should be given to developing new techniques for traditional crops and also to developing a more intensive sustainable agriculture applicable to the local level. Governments should therefore identify and monitor high-potential farm areas on which agricultural production will rely heavily. To prevent further degradation of the land, they should likewise invest in the low-potential areas (marginal lands) occupied by the poor.

In view of the constraints on increasing cropland in southern Africa, the prevention of further degradation needs to be supplemented by measures to rehabilitate the already degraded land, both in high-potential and low-potential areas. Measures to restore the productivity of degraded land must involve the local communities in the planning and implementation of plans aimed at conserving the land. Whilst considerable effort has - on paper - gone into the formulation of actions required to combat environmental degradation, the proposals did not originate from rural villages, nor did the strategies allow for the incorporation of indigenous knowledge - as they need to do - in order to ensure sustainability. The need for local communities' involvement in the decision-making process cannot be stressed enough. UNEP (1992:85) thus emphasises that "governments should encourage the principle of delegating policy-making to the lowest level of public authority consistent with effective action and a locally-driven approach." Plans and policies have to be based on a bottom-up approach, articulating grassroots level views and proposals. Involvement of private organisations, NGO's, interest groups and parastatals for contribution is also important.

There is an urgent need for a major revision of land-use planning, taking into consideration equitable distribution among citizens. Land tenure remains a thorny issue in some countries. The existing land tenure system not only contributes to environmental degradation, but no longer even fulfils the equitable social function for which it was intended. For this reason therefore, land tenure is so crucial to changes in the productivity of land and livestock that an urgent and fundamental review is required. This should be undertaken with a view to providing smallholders with secure and negotiable titles to land. Rwelamira & Kleynhans (1998:231) also emphasise this point: "Land use efficiency, agricultural production and rural employment could be increased if land tenure systems were reformed to allow access, environmental sustainability and full utilisation of the land resources".

Conserving and enhancing the resource base can also be achieved through a major orientation of technology. The challenge to agriculture is not only to

feed the growing population, but also to achieve a high level of production with less environmental damage. This requires continued long-term research into appropriate agricultural technologies. Governments therefore have to increase agricultural research expenditure. Through research the following means, as suggested by Kidd & Pimentel (1996:104), can be combined in response to specific local circumstances:

- Adapt to the environment and needs of people of each region. This means, for example, culturing crops and/or forages and livestock that are ecologically adapted to the soil, water, climate and biota, and compatible with local culture.
- Give high priority to selecting crops, trees, shrubs, and animals so that soil erosion and water run-off are minimised, soil is not adversely affected, maximal use is made of biological wastes such as manure, and biological and physical control of pests is provided.
- Use natural processes wherever possible, rather than expensive industrial processes. For example, fix nitrogen by planting legumes rather than by using fertiliser.
- Discourage people from using dung and crop residues as fuel, because this precludes recycling them as an organic fertiliser. Research into alternative sources of energy should be undertaken.

Land is not an infinite resource, as many people tend to regard it. Expanding populations and corresponding needs force people to overexploit land resources to an extent that destruction sets in. Land resources can support the human population if used in an efficient and sustainable way. An integrated land and land resources management approach is essential to achieving sustainable use of land resources. Linking social and economic development with environmental protection and enhancement will actually lead to the achievement of sustainability.

3.4 Integration of environment and development

The critical challenge now facing southern Africa is to take a full account of the social and environmental costs of economic policies, development plans, budgets and investment decisions. New models that incorporate ethical, human and ecological factors as well as economic considerations have to be developed.

Significant policy reforms are necessary to achieve balanced, integrated and multi-sectoral programmes. Singular approaches are not appropriate, but rather a number of co-ordinated, flexible strategies have to be applied in development and conservation endeavour. Yeld (1997:3) maintains that it is important to ensure a national approach for this purpose. Governments must provide a national framework of institutions, economic policies, national laws and regulations and an information base to ensure an effective approach towards integrating conservation and development. Economic development depends on the country's environment and its raw materials and life support systems. Thus, any economic policies that do not take proper account of the conservation and sustained use of natural resources are unlikely to succeed.

Governments, in co-operation with international organisations where appropriate, should strengthen capacity and capability of national institutions to integrate social, economic, developmental and environmental issues at all levels of development, decision-making and implementation. The current fragmented and sectoral approach to policy must therefore be replaced by new structures that ensure integration. Attention should be given to moving away from narrow sectoral approaches and progressing towards full cross-sectoral co-ordination and co-operation. The backlog in economic activity and infrastructure, which has given rise to low living standards, and environmental degradation necessitates support for institutional arrangements. As Corbett (1996:106) concurs, environmental considerations form an essential element of both investment projects and structural economic reform. He adds that organisations and legal provisions are essential elements in conservation, as free markets generally fail to provide protection to natural environments. Sufficient institutional arrangements and regulatory control are therefore required to correctly apportion responsibility for and usage of natural resources.

To integrate environment and development effectively in the policies and practices of each country, it is essential to develop and implement integrated, enforceable and effective laws and regulations that are based on sound social, ecological, economic and scientific principles. Environmental law, in its broadest sense, is an essential tool for achieving sustainability. It is equally important to develop practical programmes to review and enforce compliance with the laws and regulations and standards that are adopted. To make laws and regulations more effective, the following programmes should be included in the activities: i) promotion of public awareness, ii) preparation and distribution of guidance material and iii) specialised training, including workshops, seminars, education programmes and conferences for public

officials who design, implement, monitor and enforce laws and regulations (UNEP, 1992:68).

Other structural solutions to the enhancement of integration of development and conservation are the need for strong financial systems and appropriate technologies, as well as human resources. The availability of financial resources is essential for economic development and particularly for environmental conservation. The endeavour to adopt an integrated approach to development and conservation requires that financial systems be developed to ensure an effective environmental policy. International organisations, the private sector and the general public have to play appropriate roles. Technologies that are appropriate must be applied to the developing milieu – in other words technologies that impact positively on the environment (Corbett, 1996:107). At the same time, technologies that limit the negative environmental consequences must be encouraged. Human resources should be mobilised and developed to design and implement effective programmes that aim to meet conservation and development needs.

Existing systems of decision-making in many countries tend to separate economic, social and environmental issues at the policy planning and management levels. Consequently, this failure to integrate social, economic and environmental factors results in environmental and social costs. Southern Africa surely has the opportunity of avoiding these mistakes by devoting attention to multi-faceted, interrelated aspects of natural environment utilisation and conservation. This opportunity must be handled in an integrated and responsible manner, taking the realities of the region into consideration.

3.5 Regional co-operation

Regional co-operation among the southern African countries has long been accepted as an important component of efforts to promote economic growth and sustainability, as is evident in organisations such as the Southern African Development Community (SADC), and its affiliates such as the Environment and Land Management Sector (ELMS). The latter has been charged with the responsibility of environmental co-ordination in the SADC region. Links within the region must be strengthened in order to improve countries' capacity and capability to protect the environment and to achieve economic development. Regional co-operation can also be a stepping stone towards an open economy.

The countries of the region are interdependent and an understanding of this factor is important to an appreciation of the environment anywhere in the region. The solutions to many environmental problems in any country lie in the co-operation of all countries concerned. Yeld (1997:32) states in this respect that "all nations have to recognise their common interest in the world environment...We also share the world's human environment - we are all members of the same species and have a responsibility towards one another." Van Rooyen (1998:125) also explains that economic and development motivations for regional co-operation include aspects such as political stability, better investment opportunities and strengthened collective bargaining of the region vis-à-vis the rest of the world. Obi (1998:42) too stresses the idea that there is growing consensus that threats emanating from the exploitation and degradation of the environment need to be tackled globally in a co-ordinated manner. In this regard, he states that each country should define its own stake in the global effort to halt environmental degradation.

Any regional co-operation or integration has to take into account the realities facing the region and its peoples in order to work out a strategy towards dealing with them. Environmental issues are an overriding factor in the scale of effect in all countries of southern Africa. The severity of environmental problems in general and of land degradation in particular differs from country to country, but it calls for urgent attention and for both national and collective regional action.

Governments should also extend the necessary financial support to improve the performance of existing organisations to provide technical support and guidance in programme areas. Existing organisations should consider improving regional consultative processes to facilitate the exchange of data, information and experience. Co-operation will promote solidarity and consciousness among nation states. Van Rooyen (1998:129) states that this kind of regionalism will reduce conflict and the peace dividend facilitates further development. Having realised that they have common interests and similar environmental and developmental problems, southern African countries can assist one another to attain peace and stability within nations.

4. CONCLUSION

The degradation of land in southern Africa is invariably accompanied by the degradation of both human well-being and of social prospects. The efforts to combat land degradation must therefore focus on the welfare of people and contribute to the development and prosperity of the communities affected. An

important starting point in this endeavour would be to address the issue of rapid population growth and to alleviate conditions of poverty in the region.

Population growth in southern Africa is increasing at unprecedented rates, and this phenomenon, combined with unsustainable consumption patterns, places an increasingly severe pressure on the natural resources of the region and thus affects human development. The escalation of population sizes calls for greater attention to issues of sustainable development. The human dimensions are key elements to consider in comprehensive population policies and plans, which, in effect, should be integrative. Such policies and plans should encompass all other factors related to population development, such as reduction of poverty, provision of health care, family planning facilities, empowerment of people (especially women) and full recognition of their rights. Were southern Africa able to double its annual increase in food production, and to cut its annual population growth rate in half by 2020, it would then become food self-sufficient (Myers, 1998:18). This means, therefore, that governments have to have a clear understanding of the interrelationship between population and environment. Population policies are more effective if they are implemented together with appropriate cross-sectoral policies. There is thus an urgent need to increase awareness of this issue among decision-makers.

Land degradation in southern Africa, clearly evident in poverty situations, overpopulation and the depletion of the natural resource base, presents an urgent need for governments to act quickly and to act wisely. The challenge is to reduce poverty and population growth by balanced economic development in such a way that the existing pressures these problems place on the environment are reduced, and that the potentially negative environmental consequences of economic growth are mitigated. Economic growth must reconcile the short-term needs of people with the conservation of the natural resources so necessary for sustainable development. The major areas of concern include improving the quality of life of people, population control, participation of local communities, clear and coherent environmental policy and legislation and also integrating conservation in development plans. All these factors, if not taken care of, have implications for the natural and social resources in terms of encroachment on resources, pollution and environmental degradation, and subsequently for sustainable agricultural development. Failure to tackle poverty-related problems might even have more critical implications for both human and natural resources.

Aggravating poverty situations and imbalances is a matter of grave concern. In many parts of the region, the basic needs of large sections of humanity are

not met. Attention with regard to improving the quality of life of the poor has to be placed on provision of food by encouraging self-reliance, health care, shelter and educational needs. At this juncture, it must be evident that, in order to reduce the immense stress on the environment, the principle of improving the quality of life must be high on the agenda of development. It must be emphasised though, that this approach need not be a single sectoral one; it must be multi-faceted, and must encompass all other related issues.

It becomes clear that environment and development are enmeshed in political, economic and social issues. However, governments have tended to focus on economic development, thereby neglecting the very environment upon which economic development depends. Adopting integrated management systems, particularly for the management of natural resources, is imperative. Policies should be comprehensive and integrative, harmonising economic, social and environmental aspects, and emphasising local participation in the decision-making process. Promoting awareness amongst the local people, as well as increasing their participation in decision-making and implementation, is a key to sustainability. In order to facilitate a sustainable rural environment, development policies will have to be not merely statements of ideals, but practical tools that can help create a positive environment. However, the resources in shortest supply to assist in this endeavour appear to be human innovation, appropriate technology, policy responses backed by political will and, above all, time to mobilise these diverse resources.

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