CHAPTER 12

FORESTRY DEBATES IN SOUTHERN AFRICA

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Introduction

Woodlands and forests are an integral part of the environment and are a prime factor in the livelihood of mankind in a number of ways, including the provision of fuelwood, creation of sculptures, regulation of climate, and provision of sinks for carbon dioxide. The main consideration with respect to the use of trees is to use them in a more sustainable manner and to conserve them for future generations such that their productive capacity is not seriously affected. Sustainability of the use of woodlands and forests can only be realised and maintained if grassroots decision making and participation is encouraged at local, national and regional levels. This means that there is a need to use the existing indigenous resource management as the building blocks for sustainable development. The other question to be explored is the need to conserve *biological diversity* which entails a variety of genetic resources which are essential in the interlinkages between living organisms and their environment. Indigenous forests and woodlands, because of their diverse nature and their adaptability to the natural environment of the region throughout time will ensure that biodiversity is maintained. Therefore, those rare animal and plant species which are unique to this region will be preserved for the future.

According to Clarke (1994), traditionally, people in the SADC region have lived in harmony with trees but this delicate balance is changing because of more demand on woodland resources (like deforestation) as a result of population growth. Despite the fact that trees are slowly diminishing, the people of the region still have deep respect for trees and a detailed knowledge of their names and uses. Furthermore, a wide range of traditional woodland management practices have evolved and continue to evolve in response to forest disturbance like deforestation.

In the past, traditional woodland management have been ignored in favour of management strategies which were developed outside the region which did very little to halt the deterioration of woodland resources. Until and unless there is a recognition to promote traditional woodland and forest management strategies, sustainability will never be realised.

Most traditional SADC rural communities still have deep respect for indigenous forests and woodlands which are expressed in their mythology, traditional religions and ceremonies. Traditional doctors continue to procure some of the medicines from forest resources.

Extent and Variation in Indigenous Forests

In the SADC region there are large tracts of land which are still covered by indigenous forests and woodlands. However, the extent and variation of these forests vary with climate and the geological influence of the region. Namibia, Botswana, Southern Zambia and Zimbabwe are mainly dominated by the Kalahari sands and therefore the vegetation which is mostly thorn scrub savannah, tree and scrub savannah in the that kind of environment is very similar in the aforementioned regions. As one progresses from Southern Zambia northwards, the vegetation changes from dry forest, to seasonal forest and into the rainforest. Mozambique, Zambia, Angola and Tanzania are mainly dominated by the dry forest, Zimbabwe by tree and scrub savannah, Botswana by thorn scrub savannah and tree and scrub savannah. South western part of Botswana is mainly covered by desert vegetation (arid shrub savannah). Namibia is dominated by the desert vegetation and the north of the country is vegetated by tree and scrub savannah. South Africa has more complicated vegetation types, which is a reflection of the complex microclimates within that country. The Northern Province, Gauteng, Free State, and North West Province are mostly dominated by the tree and scrub savannah. The Cape and the Northern Cape Provinces are mostly dominated by desert and thorn scrub savannah which extends into Botswana and Namibia. The Eastern Cape, Mpumalanga, and KwaZulu/Natal have mostly grasslands and the eastern coast has areas covered with the rainforests because of the rain throughout the year.

Table12.1

Woodland and forest resources in southern Africa
(Land areas in km^2)

(*Source*: State of the ENVIRONMENT in Southern Africa 1994).

Country	Land Area (km^2)	Natural Forest & Woodland	Existing Plantations	Percentage Annual Reforestation (Deforestation)
Angola	1 246 700	1 170 651 (94%)	1800 (0.14%)	0.002% (0.2%)
Botswana	566 730	525 600	7 (93%)	- (0.0012%	(0.1%)
Lesotho	30 355	160 (0.0053%)	70 (0.23%)	0.03% (-)
Malawi	94 080	45 510 (49%)	1440 (1.5%)	0.043% (3.5%)
Mozambique	784 090	581 350	400 (74%)	0.005% (0.05%)	(0.8%)
Namibia	823 290	560 650	2 (68.1%)	(-) 0.0002%)	(-)
South Africa	1 221 037	45 150 (3.7%)	16 400 (1.3%)	0.05% (-)
Swaziland	17 200	5 996 (34.9%)	1 040 (6.0%)	0.29% (-)
Tanzania	886 040	599 400	980 (67.6%)	0.01% (0.1%)	(0.3%)
Zambia	743 390	676 067	629 (90.9%)	0.003% (0.08%)	(0.2%)
Zimbabwe	390 580	233 900	1 500 (59.9%)	0.01% (0.38%)	(0.4%)
TOTALS	**6 803 492**	**4 445 434 (65.3%)**	**22 959 (0.34%)**	**0.014% (-)**

From the Table 12.1 above, Angola has the highest percentage area (94%), followed by Botswana with 93% of the land still covered with natural forests and woodlands. This implies that the two countries have not been disturbed by anthropogenic activities significantly. In Botswana's case, the population is still very low (1.3 million people) and is concentrated on the eastern part of the country. Angola has been ravaged by long trials and tribulations of war and subsequently most of the inhabitants of Angola have not found it easy to go into forested areas because of the danger of land mines or have been in fear of being attacked. Although land mines are a menace to the Angolans, the environment has benefited because large tracts of land lie undisturbed by human activities.

South Africa has the lowest percentage of natural forests and woodlands because most of the country has been disturbed by human activities. To redress the deforestation of natural woodlands and forests, South Africa is one of the countries which has embarked on the creation of plantations throughout the country with the aim of conserving the land on steep slopes which are a common occurrence.

Swaziland has the highest percentage of existing plantations (6%) and this could be explained by the fact the country is mostly mountainous and therefore it is essential to protect the soil from water erosion.

Lesotho has the lowest percentage of natural forests and woodlands because historically Basotho were pushed away from the lower fertile valleys by the settlers to the mountains, where they settled. This crowding of Basotho in limited land lead to the overutilisation of the forest resources and therefore this explains why Lesotho has the lowest percentage coverage of natural forests and woodlands.

In general, SADC region has a reasonable percentage (65.3%) of natural forests and woodlands which ensures that most of genetic diversity of the region can be conserved. Plantations of exotic species play a meaningful role in the conservation of the land and in providing alternative wood resources for the local people. Conservation of natural forests and woodlands can only succeed if it has the blessing of the local communities.

Goods and Services from the Natural Forests

For most people in the SADC countries, *indigenous forests and woodlands have for centuries provided building material, fuelwood, food, medicines, cosmetics, regulated local climate and shelter. In addition to this, many trees have been of great cultural importance,* as for instance, leadwood (*Combretum imberbe)* or, in the very old Namibian legends, the *Omumborombonga* tree has been respected as an ancestral tree. According to the stories told from generation to generation, human beings, cattle, sheep and various animals originated from that tree (Asare, 1990).

Indigenous forests and woodlands play a very crucial role in the livelihoods of the people of Southern Africa. There are quite a number of uses which have been derived from timber from the woodlands. *The most common usage is the firewood from forest and woodlands.* Most traditional communities depend on firewood as an energy source and therefore felling of trees around settlements is very common. It has been confirmed by Kgathi (1989) that the distance to collect firewood has increased with time. This has exerted a lot of pressure on most families because they spend most of the time travelling to collect firewood

and neglecting other aspects of their livelihood. Fuelwood is used also for heating homes, lighting and cooking. Therefore it could be discerned that fuelwood is of paramount importance in the lives of most inhabitants of the SADC region. According to Cogill and Kiugu (1990), in Namibia in the Owambo, 95% of the households had no electricity and 85% used wood for cooking. Erkkila and Siiskonen (1992) reveal that the most marked long-term change in the energy supply scheme had been the increase in the hauling distance of fuelwood. At the beginning of the last century fuelwood was fetched mainly from the adjacent forested areas lying between population clusters or communities, but today in most areas these forested areas have almost totally disappeared from densely populated centres.

In all rural areas of SADC countries, woodlands are very popular in the construction of houses, kraals and also in the carving of sculptures for selling mainly to tourists. In Zimbabwe, Botswana, Namibia and Zambia the most important tree species used for carving is the wild teak (*Pterocarpus angolensis*). Trees are also an important source of veld products like the wild berries, nuts and some fibres and this is mostly important in the rural areas. It is also worth noting that most of the villages in Northern Botswana, Namibia, parts of Zambia and Zimbabwe still use poles for the construction of their houses and homesteads and the most popular tree used is the *Colophospermum mopane* (Mopane). The mopane poles are highly resistant to the action of termites and this is why they are very popular in the construction of houses. Mopane is also very popular as a source of fuelwood because it does not smoke too much.

In Namibia and Northern Botswana, the most important fruit trees are: ***Marula*** (*Sclerocarya birrea subsp. caffra*), ***Omuye*** or bird plum (*Berchemia discolor*), ***Omwandi*** or African ebony (*Diospyros mespiliformis*) and ***Omulunga*** or fan palm (*Hyphaene petersiana*). Wine and brandy are made from wild fruits and the most popular wine is made of marula.

Baskets of various types are also made from forest resources and these include cereal containers, fishing baskets and tunnel nets. The most common material used in the making of baskets is the young leaves of fan palm, which are first dried and then split into narrow strips. Various wooden containers, cups and buckets are made from the fairly soft woods of *Albizia anthelminitica, Berchemia discolor, Commiphora africana, C.angolensis, Peltophorum africanum, and Ricinodendron rautanenii.*

In Botswana, Zambia, Namibia, Zimbabwe, Angola and Malawi, wooden mortars and pestles are used to grind millet and sorghum and sometimes also to pulverise leaves of several species for body powders used to reduce body odours and provide a pleasant scent. The mortar or base is usually made from the heartwood of *Burkea africana* and sometimes from *Combretum imberbe* or

Pterocarpus angolensis. The pestle is obtained from the heartwood of *Colophospermum mopane* (Rodin, 1985).

Drums, the universal traditional instrument throughout Southern Africa, are usually of hardwoods such as *Pterocarpus angolensis* or *Sclerocarya birrea subsp. caffra.* Dug-out canoes are used commonly along the rivers and flooded areas in the Okavango Delta, Victoria Falls and Lake Kariba. Most of these canoes are made from the following tree species: *Baikiaea plurijuga, Guibourtia coleosperma and Pterocarpus angolensis.*

Traditionally most of the people in the SADC region have cultural activities like initiation ceremonies which are normally carried out in secluded forest areas. These are very *important cultural as well as religious rites which commands the use of certain indigenous forests. Forests also provide a natural environment for citizens to come closer to nature.* This view applies more especially to the city dwellers who once in a while go out into the forests to experience the wilderness. In addition, forests have an aesthetic beauty which can attract tourists which might bring revenue to the country. Most tourists are interested in the environment in its pristine condition.

Forests and woodlands are absolutely crucial in watershed management. A well vegetated watershed is protected from water erosion and therefore generation of sediments which could be carried to the streams and lakes thus reducing their volume is markedly reduced. If indigenous forests are conserved in watersheds, this has an added advantage because they are well adapted to their natural environmental conditions and therefore will be more effective in reducing production of sediments by erosional processes.

A variety of genetic resources can be obtained from diverse tree species and therefore *indigenous forests and woodlands which are diverse by their very nature provide an opportunity for having a wide spectrum of genetic material.* Therefore plantations which are mostly single species impact negatively on the idea of biodiversity. In natural ecosystems biodiversity is very important because organisms are dependent on each other through food chains and food webs. This complex interrelationship of organisms can be seriously disturbed if some of them are removed by anthropogenic activities like deforestation. The ultimate result might be the disappearance of some very important plant genetic material and other organisms probably very important in the medical field.

The *idea of genetic resources in woodlands and forests has to do with scientific, social and economic value arising from genetic diversity between and among species.* One of the most important factors about genetic variation is that it provides a natural barrier against alterations in the natural environment. The natural balance includes protection against those changes brought about by diseases, pests climate etc. Genetic variation make it possible for different

plants and animals to adapt and multiply in an environment in which they would not otherwise function. These natural adaptive mechanisms can only be possible if trees have not been reduced to a few or single species.
The concept of an ecosystem in most countries of the world has been reduced to something that could be read in books. It is of utmost importance that samples of ecosystems should be preserved in the SADC region. Governments through their game parks and nature reserves have gone a long way in preserving natural ecosystems. Such natural ecosystems will be rare in the future because of the competing demands on land resources for different uses. It is therefore advocated that our environmental conservation policies be strengthened.

As the population increases within the SADC region, more and more land will be needed to produce food. The demand for more arable land imply clearing more trees for ploughing. This is tantamount to reduction of biodiversity of the region. There are certain government policies which encourage clearing of the land for arable agricultural purposes like Accelerated Land Development Programme (ALDEP) of Botswana which was meant to assist the resource-poor farmers with destumping of their fields. The result of the programme was that large tracts of land was cleared with the sponsorship of the government and only a small percentage of the land was placed under productive arable agriculture. This was very unfortunate because Botswana is an arid country and clearing of vegetation can only lead to more environmental problems including the loss of genetic resources.

Zonation of Forest Lands

In most SADC countries, there are forest reserves, game reserves and parks which are mostly controlled by the state. There are however, a few of the above mentioned land uses that are run privately more especially in South Africa.

In all SADC countries, there are departments of wildlife and national parks with the aim of conserving wildlife resources. It has been realised that such resources belong to the whole nation and therefore must be controlled in such a way that they benefit the majority of people. The returns which are gained from a good wildlife management programme are in the form of foreign currency from tourists. In Botswana, the government has adopted low volume strategy for visitors into the game parks. This has an advantage of attracting a few people to our tourist areas but who spend a significant amount of money. This has an added advantage because the environment could be kept in its almost original form, thus maintaining biodiversity of the land. The main disadvantage of this approach is that not many local people have money to spend on very expensive tourist ventures and as a result it is only foreign visitors who are likely to benefit from such an arrangement. A counter

argument might be that the whole nation will benefit from foreign currency brought into the country by tourists. The other argument might be that employment opportunities are created when the local people are employed by the tourist industries as guides and even in hotels.

The general world mood is towards privatisation including that of forest reserves. The main advantage with having private land is that the owners are always striving to maximise productivity and in doing that creating employment for most people. Management is thought to be more efficient and thus contributing to the general productivity of the area. The disadvantages with private land is that all the resources within the private land are to the exclusive use of the owner and therefore all those other resources that he does not need are not accessible to the general public.

Public or communal land in most cases does not have strong management mechanisms and as a result the land is normally placed under very serious pressure because of the competing demands on it. Resources under public control including woodlands and forests are sometimes over-harvested which could lead to reduced biodiversity and soil cover. Reduction of vegetation cover make the soil prone to soil erosion. Communities must be encouraged to engage in sustainable utilisation of forests and woodlands. This approach will ensure that both *non-consumptive uses* (for example trees to protect the soil, aesthetic beauty of the land, cultural as well as religious sites) and *consumptive use of certain tree species* for sculptures and curios for tourists are conserved by all people using them thus promoting sustainability and conservation of biodiversity in any particular locality.

The Justification for Indigenous Forest Management

Most of Southern Africa has been troubled by *deforestation as a result of over-harvesting of the regions forest resources.* To counteract this problem, SADC countries have engaged in rigorous *afforestation programmes in the form of plantations of eucalyptus and pine trees.* Examples of plantations in the region are: Usutu pine plantation in Swaziland and Mufundi plantation in Tanzania. These exotic forest plantations are composed of only one species and therefore they seriously affect the biodiversity of the region. Exotic plants which have been found to be very competitive in this environment and therefore they have been found in some instances to push out the indigenous forests thus contributing to reduction in biodiversity. According to Chenje and Johnson (1994) Blue swallows disappeared from Zimbabwe's Eastern Highlands in the 1970s, because of the loss of habitat due to exotic tree planting. In South Africa, about 30% of the transvaal's rare and endangered plants are in areas targeted for tree plantations. In Tanzania, pine plantations occupy land previously covered with indigenous woodland and most of Malawi's tree plantations replace afromontane forest.

Exotic trees have been found, in *addition to out competing indigenous trees, to use a lot of water for their fast growth and the consequences are the drying of streams*. This concern has been mostly registered in South Africa which has the highest number of plantations in the region. It was recorded that on Cathedral Peak in South Africa, streamflows were reduced by almost half within two decades of widespread planting of pines in grasslands. Overall in South Africa, tree plantations have reduced river runoff by 2.4 %, or 1 284 cubic metres.

It is abundantly clear that SADC countries have to engage on a rigorous research programme to utilise indigenous trees in plantations because they have evolved in this environment for many years and therefore are well adapted to the soil, climate and the diseases within this region. This approach will ensure the biodiversity of SADC is maintained.

Multiple Use Management Strategies

Forests and Woodlands Management

The only way forward in the use of indigenous forests and woodlands in Southern Africa is by gaining the support of all interested parties involved. This will involve striking a balance between forestry management by communities, private groups, individuals and governments.

Forests and woodlands could be managed in such a way that they can provide firewood for rural population, timber for industries, traditional curios normally bought by tourists and indeed as cover to protect the soil from erosion. This multiple approach to utilising forests will ensure that benefits derived from them will go to a cross section of the nation.

Need for Efficient Charcoal Manufacture

Traditionally, most of the people in the SADC region use fuelwood for cooking and this is normally done in open air which tends to waste heat energy and therefore demanding the use of more wood resources. *One management strategy that could be engaged is by developing stoves which can use energy more efficiently for cooking. More efficient charcoal manufacture strategies by local communities could also be encouraged in order to reduce more harvesting of wood resources.*

Conservation of Woodland and Forest Resources

Poles for the construction of houses and fences could also be treated such that they last longer in the environment and the net result is the reduction of harvesting of trees for the same purpose. The pricing and marketing of woodland resources must be geared towards *conservation of woodland and*

forest resources. More money could be paid to collectors from woodlots and regulated areas and less to those collecting firewood from natural forests. Legislation could also help by forbidding cutting of natural woodlands and forests. It has to be emphasised that the realisation of these strategies can only succeed with the support of the local communities and this requires more *public education* on the importance of conserving our natural resources. The target group should be mostly school children who should be encouraged to grow up with this natural resources conservation spirit. The general public should also be made aware of conservation issues and demonstration should also be made of how to control things like soil erosion in order to achieve sustainable production of the land.

Agroforestry Practices

Farm forestry by local communities should also be encouraged and this will take the form of village woodlots where harvesting of trees for various functions could be permitted. Agroforestry could also be tried which will involve planting trees along side crops. The tree species grown will depend on the needs of a particular community. For example, communities in need of *fuelwood* will plant trees which can give them firewood. Those who are aiming at *improving the fertility status of the soil* will concentrate on species which fix nutrients into the soil. *Windbreaks and shelterbelts* could also be planted to slow down high velocity winds which might cause a lot of damage to the land in the form of wind erosion.

Community Support

For any forestry management strategy to succeed it must have the full support of all the people involved. Politicians as the policy makers, should be made aware of the importance of conservation of woodland and forest resources. Grassroots participation in both planning and implementation approaches should be encouraged in order to ensure that the process moves from the bottom to the top. This strategy will ensure that any proposed project has the full support of the local communities. It has to be emphasised that natural resources conservation (including forests and woodlands) requires the participation of all citizens, all government departments/ministries and non-governmental organisations which must be guided by a strong government policy and control in recognition that this is a colossal task which has demographic, social, technological, economic and political dimensions.

Genetic Banks for Woodland and Forest Resources

In order to ensure that the regions genetic resources are not lost by whatever means, there is a need to create genetic banks for woodland and forest for SADC. With the modern biotechnology techniques those species which are in

danger can be propagated and be redistributed throughout the region. The creation of gene banks requires a lot of financial resources and may be that is where the contribution by international financial organisations will be mostly valuable.

Industrial Wood Production

Industrial wood production must be tackled with utmost care and this will entail doing a lot of research on the sustainable harvesting methods and how much to harvest. Once enough research has been done, harvesting at appropriate levels could be recommended in order to supply wood industrially. Industrial plantations and processing plants create jobs for the rural communities.

Institutional Support

National forestry institutions like Forestry Association Botswana (FAB) must be given a lot of support to build their institutional strength so that they *engage in high profile research on indigenous woodlands* and forests with the results that can benefit the whole nation. This can only be achieved if international organisations can provide massive *support for the education and training of professional and technical researchers*. With strong institutional capacity, research results can flow between countries within the region thus ensuring research questions of interest to the whole SADC are carried out systematically thus facilitating the exchange of information between researchers to be more easy. The research results should be appropriate, meaning that they must be geared towards the user. It is pointless to generate information that cannot benefit the majority of the people in the region in the long run. In order to ensure that results are immediately applicable to the user, the user must be involved during the research process in order to solve the problem that he is facing. Extension service can also be tried to use the research results to the benefit of the user (Clarke, 1994).

Major Conditions for Sustainable Management

Governing-Community Collaboration

For woodlands and forests to be managed sustainably, governments and communities must work hand in hand to ensure that the resources are not used beyond levels of possible regeneration. It has to be emphasised that for any government policy to succeed it must have the support of the majority of the people and the same principle will apply to forestry management.

The above suggestion does not wish to preclude individuals to venture into forestry industry. *A balance has to be struck between the management of forest resources by individuals and governments alike.* This arrangement will ensure

that national projects could benefit from the revenue accrued from forestry and woodlands managed by the state as well as by individuals. For example in Botswana ***Mukwa*** (bloodwood) and ***Mukusi*** (Zimbabwean Teak) are being exploited commercially by a private company but how much to exploit these trees is controlled by the government. As a result there is no danger of overexploiting the vegetation because there are guidelines like cutting mature trees of a minimum diameter of 30 cm per acre. At this rate there is no danger of exhausting forest resources.

Institutional Strengthening

Sustainable management of woodland and forest resources can only be realised if forestry institutions are provided with the necessary capacity and strength in terms of trained professional and technical personnel. This will ensure that reliable forestry databases throughout SADC are created and the exchange of information is facilitated. Those plant species which are under threat of extinction can be conserved throughout the region thus ensuring plant genetic diversity of the region is maintained.

Conservation: Multinational Approach

Conservation of natural resources demands multidimensional approach and therefore research on the most suitable plant species to conserve soil requires the input of plant scientists as well as those of soil scientists. The multidisciplinary approach to resource conservation must be reflected in research teams which are investigating questions with the view of making recommendations to the users.

Investment on Conservation of Forests and Woodlands

The complexity of diverse wildlife resources could only be maintained if forest and woodland resources are conserved. *Plantations of exotic plant species should be approached with caution because we might run into the danger of losing some of our rare wildlife species.* Therefore it is being suggested in this discourse that governments should come up with deliberate policies to encourage individuals and groups of individuals to invest in forestry industry of both indigenous woodlands and exotic plantations. *Where the land is badly affected, it is most appropriate to plant fast growing plant species* which could protect the land from further damage. The other reason to *invest in the conservation of woodlands and forests is their ability to provide timber and fuelwood to both the industry and fuelwood for local consumption.* This has an added advantage because communities could be directed to specific areas where they can collect firewood for their needs thus reducing pressure on natural forests and woodlands.

Forests and woodlands must be conserved in order to preserve the genetic diversity of the plant species of the region. It has already been pointed out that organisms within the environment are interrelated to each other and therefore if there are some missing in these interlinkages, this will inevitably lead to the disappearance of certain species. Therefore, it is recommended that money has to be sourced from international and national governments to embark on a programme to create gene banks of rare species. If such species disappear from the environment, they can be re-introduced.

Summary and Conclusions

Forests and woodlands are part of the linkages which exist in ecosystems and therefore are very important in ensuring that the diversity of life is perpetuated on earth. The reduction of biodiversity is brought about by single species plantations which in the long run adversely affect the genetic resources of a particular area. Plantations of exotic plants have been found to cause a lot of problems like the use of too much water leading to the drying of streams and they also outcompete indigenous trees again contributing to the reduction in biodiversity.

Firewood, sinks of carbon dioxide, climatic regulation and construction of households are some of the uses which are provided by forests and woodlands. Land degradation could be arrested by the use of indigenous trees which are well adapted to the environmental conditions of the region.

Conservation of forest resources can only be successful if it includes participation of local people at all levels of decision making. It has to be emphasised that commercial logging has the potential to bring revenue to respective countries but it must be regulated in order to control the amount of harvesting of tree species. The control of harvesting will ensure that biodiversity is maintained and the question of sustainability is also addressed to spare some of the trees for future generations.

Indigenous trees add aesthetic beauty to the landscape and in addition there are certain forests which have been used for traditional ceremonies and other cultural matters and therefore must be conserved as part of history and heritage.

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