Guidelines for the utilisation of water resources and protection of wetlands in Namibia

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ABSTRACT

The conflict between the need for water supply infrastructure development and concern about the possible impact of such development on the environment must be addressed in a scientific and pragmatic way when considering water resource utilisation and the protection of wetlands in an arid environment. A policy for the protection of wetlands should therefore recognise the need to compromise between development and conservation.

INTRODUCTION

The purpose of this paper is to outline the approach of the Department of Water Affairs to the wise use and protection of Namibia's scarce water resources with special reference to wetlands.

The necessity to utilise the available water resources in a country may have an impact upon wetlands in certain catchment areas and it may be a matter of environmental concern if not approached in a scientific practical and pragmatic way.

Before a policy for the protection of wetlands in Namibia can be adopted it is necessary to be aware of the importance of the available water resources to support development and to define wetlands in the context of the arid environment of the country. The next steps will be to identify the most important wetlands according to the definition, to determine a strategy for the protection of those wetlands and to formulate a policy which could serve as both an input to possible future legislation and to guide future action for conservation and management of the identified areas.

In general, when looking at the development of a water resource versus the effect such development would have on a wetland, a one-sided approach to the conservation of wetlands, or the implementation of a proposed water scheme should be avoided by considering an environmental impact assessment for each case. This should subsequently lead to proposals for sound environmental management procedures.

The objectives of a conference on the conservations of wetlands should be directed to:

1. Disseminate expert knowledge and information in specialised fields of interest and concern to all delegates.

2. Define what is meant by a wetland in the context of the arid environment of Namibia.

3. Accommodate the requirements for water resource development to enhance socio-economic development in Namibia.

4. Determine whether there are any real conservation problems and what those problems are.

5. Name specific wetlands which require special protection and to specifically exclude the others.

6. Establish why conservation of the identified wetlands is necessary and whether such conservation is warranted.

7. Determine which laws and legal structures exist, which adjustments are necessary, how they should be implemented and applied and who should be responsible.

8. Determine a strategy, an acceptable policy and appropriate action, but always keeping manpower and financial constraints in mind when making proposals.

HYDROLOGICAL CONDITIONS

The hydrological conditions in the country are governed by low rainfall, high temperatures and high evaporation rates. The average annual rainfall is less than 250 mm and evaporation may be as high as 3700 mm (Water Affairs 1990). The result of these conditions is that only ephemeral open waters and rivers occur in the interior of Namibia. The source of water for the recharge of the very important groundwater resources such as the alluvial aquifers in the Omaruru, the Kuiseb and the Khan Rivers or the dolomite and marble aquifers in the Karst Area and at Otjiwarongo, or the hard rock aquifers in most of the commercial farming area, is the low rainfall and runoff patterns found within Namibia.

The only perennial water sources are the Cunene, Kavango, Kwando-Linyanti-Chobe, Zambezi and the Orange Rivers on the borders of the country. Most of the runoff in these rivers originates in the high rainfall areas of our neighbouring countries like Angola and South Africa. The surface water storage dams in the interior of Namibia may also be seen as perennial lakes, but they are relatively small and subject to depletion due to the utilisation of the water and evaporation. In all cases, the volume of water that evaporates is much more than the actual volume of water utilised for consumption, and the total efficiency of the larger dams is therefore very low, for example between 8% for Naute and 62% for Von Bach.

It is estimated that the safe, sustainable yield of the water resources in the interior of Namibia is 500 Mm^3/a of which 200 Mm^3/a is available from surface water and 300 Mm^3/a from groundwater.

WETLAND TYPES IN NAMIBIA

Although wetland conditions may exist along the shores of our dams or "inland lakes", especially at the places where the water flows into the dams, the deposition of the silt load during runoff has a substantial influence on the quality of the wetlands which are formed. The pressure of development and the necessity to utilise the water in the dams also result in fluctuations in the water level and water quality. This influences the location and

life of a specific wetland as well as the occurence of associated vegetation.

The Hardap and Von Bach dams are surrounded by game parks and sometimes animals become mired in mud in the upstream reaches of the dam. The Omatako dam is also an example of an evaporation pan with a beautiful wetland on the inflow side. This wetland supports a large number of mammals and birds when there is water, but after one or two seasons without rainfall, the wetland may disappear and lose its significance. Other examples are the many ephemeral pans which may disappear soon after the rainy season, including the Etosha Pan to the south of Owambo, the Bushmanland pans, the Cuvelai drainage basin, the wetlands associated with the west flowing rivers and Lake Liambezi in East Caprivi. It therefore seems that the occurrence of permanent wetlands in the interior of Namibia is insignificant.

The seasonal nature of the runoff of the perennial border rivers also affects water levels and the occurrence of wetlands, but although the water levels may rise and fall, some portions remain as perennially wet areas and can be considered permanent wetlands. Our coastal wetlands, however, seems to be more stable and can be viewed as wetlands which may require efficient environmental management to conserve their important function in nature.

It can also be argued that a wetland does not have to be permanent to be classified as a wetland. A wetland can be defined as the interface between aquatic and terrestrial ecosystems, whether seasonally or perennially inundated with water. However, the most important single feature which distinguishes wetlands from other aquatic systems is an abundance of vegetation and a wetland can also be seen as an area which is sufficiently saturated with water to allow plants characteristic of wet soils to grow there (Greeson et al. 1978). This is not the case in man-made lakes or ephemeral surface water in arid environments. We therefore have to carefully consider what type of conservation status should be given to the different types of wetlands.

WATER RESOURCE DEVELOPMENT

The necessity for the development of water resources is due to factors such as the increase in population, the improvement in the quality of life and socio-economic growth, including industrial, mining and agricultural development. The priorities for water supply development by the Government are for human and animal consumption, industrial demand (including mining) and agriculture. The establishment of water projects to meet the water demand is determined by the existing water consumption, the estimated future water demand and the projections which are made to determine the timing and funding of new projects. According to the latest estimates, the water demand in Namibia will increase from 250 Mm^3/a in 1990 to 400 Mm^3/a in 2005. The capital cost of water projects is prohibitively high and no water project can be established if it is not economically justified and affordable within reasonable limits. A cost-benefit ratio analysis must also be done to determine the financial implications in terms of the advantages of the project.

The approach to the development of water resources are that available local sources should be utilised first, then regional sources, which may be further away from the consumer, and then national sources which may be located very far from the consumer. This is necessitated by the fact that local sources, i.e. the source nearest to the consumer, are the least expensive to develop. Regional and national water projects are also necessary because local sources cannot always meet the increasing water demand, and most of the available water sources in the country are located well away from the areas of highest consumption.

The availability of sufficient water resources in an arid region and the possible choices between different sources suitable for further development, are limited. The long term sustainable yield of a water source must also be determined in order to avoid over-exploitation and the ultimate destruction of the resource.

At present the Department of Water Affairs is also leading the field in environmental impact assessment and integrated environmental management as far as infrastructure development projects in Namibia are concerned. The Environmental Evaluation Unit of the University of Cape Town has recently been appointed to conduct an environmental impact study on the proposed Omdel Dam project which is aimed at enhancing groundwater recharge in the Omaruru Delta. The Department also restructured its Steering Committee looking into the effects of the canal component of the Eastern National Water Carrier on wild animals. It now includes members from environmentally concerned public organisations to assist with the formulation of proposals to manage the problem of animal mortalities in the canal.

From the above it is clear that no water resource will be developed by the Department of Water Affairs unless it has been investigated thoroughly and the full environmental, economic and financial implications determined.

WATER AFFAIRS APPROACH TO FUTURE WETLAND UTILISATION

At present there seems to be no river catchment development which would have an impact on the permanent wetlands in Namibia. Preliminary investigations have determined the potential for dams on most of the major west and south flowing ephemeral rivers as well as the perennial border rivers. However, the future harnessing of any of these resources will depend on the necessity for development in terms of water demand, environmental considerations and the availability of funds. The management of all project implications will also be evaluated in advance.

When looking at the future of wetlands and the possible development of water schemes, it is important to realise that Namibia is an arid region with limited water resources. These resources should be, and are at present, controlled, managed and conserved by the Department of Water Affairs in the interest of the country. However, where there is a need to utilise the available resources, the balance between development and nature conservation will always be maintained within acceptable limits and legal constraints.

CONCLUSION

It is well to remember that no development has ever taken place without it having had some influence on the environment. If development is necessary and must take place, the resulting environmental implications should be determined within reasonable limits and the problems should be managed efficiently. A balance must be maintained between the implementation of development projects and the demands of nature conservation, but care should be taken that essential development projects are not jeopardised by injudicious nature conservation measures, nor vice versa. All these principles should apply when considering a policy for the protection of wetlands in Namibia.

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