

F CONCLUSIONS AND OUTLOOK

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F1 MAIN ENVIRONMENTAL CONCERNS

F1.1 URBANISATION AND AGGLOMERATION

All of the sectors apart from mining are seeing a concentration of activities on particular areas. For instance manufacturing, road use, and energy provision. The vehicle population is extremely concentrated in Windhoek, with around X% of the total. Virtually all international flights are from Hosea Kutako International Airport, and a high percentage of domestic flights originate or terminate at Eros. Maritime operations are overwhelmingly centred on Walvis Bay. Road transport generally is centred on the tarred roads. Manufacturing is similarly centred on Khomas and Erongo, which around 80% of manufacturing activity. Energy use generally follows these patterns of economic activity, but is obviously slightly more diverse due to domestic and mining energy use away from these centres. Mining stands out as distinct in that its activities (apart from beneficiation) are obviously linked to where the minerals are. As well as domination by geographic area particular sub sectors also dominate: Food processing within manufacturing, roads in transport, liquid fuels and electricity in energy, diamonds in mining all dominate their sectors. To a certain degree this has important implications for environmentally sustainable development. Related to the degree of spatial concentration there is obviously a strong need for strengthening and supporting local authority capacity in the key economic centres. Windhoek and Walvis Bay already have experienced municipal authorities that are dealing with many of these issues, so probably require less support than the emerging Oshikango-Oshakati-Ondangwa economic centres. Secondly the degree of concentration on particular activities within each sector means that there is some scope for interventions on the model of the DANCED support to the fish processing industry.

F1.2 GROWTH

There is substantial growth potential in the sectors examined, particularly in the transport and manufacturing areas. Mining and energy are only likely to see important

developments in the context of particular large projects such as Scorpion Zinc or Kudu gas. There is also a lot of potential capacity for growth, in particular in the transport sector which has large amounts of underused capacity. This implies that in the transport sector most emerging environmental issues will be related to increased operations rather than infrastructure development.

F1.3 SUSTAINABILITY OF INPUTS

A high proportion of all inputs are imported, and cause very few (if any) problems with sustainability. There are two major exceptions to this statement. Firstly the issue of wood use is still rather poorly understood. Data on deforestation does not exist, and the degree to which this is related to wood fuel use appears to be low. Hence this will not be monitored by indicators since this is not possible. Secondly there is the issue of water use in processing. The mining industry is the only large user here. The analysis by the Directorate of Environmental Affairs' Natural Resource Accounting Programme in 1997 found that 11% of national water use is by mining. The significance of this is very variable by location. Water use at Rossing mine has a high significance due to its location in a water scarce area where there are competing sources of water. The Water State of the Environment report illustrates that despite this the mining industry in areas such as Rossing can afford to pay the long run cost of water from desalination. In other areas, such as the south west of the country, population densities may be so low as to mean there is no effective competition for water between different uses. This might mean that even quite wasteful use of water by mining can be justifiable. Manufacturing water use was found to be extremely low for most companies, due to the focus of the sector on light industries. This confirms the preliminary research by Directorate of Environmental Affairs' Natural Resource Accounting Programme in 1997. Only the large meat and fish processors and the brewery are large water consumers. These can be expected to see substantial growth so are of some significance, but it is recommended that these are monitored by the project in the context of water, rather than manufacturing. Again there is ample evidence that manufacturing can pay the full economic (involving environmental) costs of water.

F1.4 WASTES

Wastes and potential pollution from them are one of the key issues identified by the study. With the exceptions of the particular sectors mentioned above where there are particular waste problems, waste management must be rather general. The types of waste produced are diverse from noise and smells to water and solid pollutants. These wastes are of mainly local significance and hence are appropriately dealt with by the relevant municipality or regional council. This underlines the need for strong cooperation between the key municipalities and the envisaged Pollution and Waste Management Agency.

F1.5 EIAs AND SEAs

A notable fact is that there have been environmental assessments for most large projects in these sectors. However as noted in the transport section follow up through environmental management plans and audits is not common. It is difficult to know how to monitor these issues since the most important aspect mentioned by a number of stakeholders is the ability of the responsible agencies to monitor compliance to legislation.

At a more strategic level very little has been done. The Energy Policy for Namibia was the result of a reasonably inclusive consultative process, as were the policies on manufacturing. However there have been very few attempts to look at more strategic issues. For instance the impact of congestion, accidents, air and noise pollution on the quality of life in Windhoek is very low at present, but could well become substantial in future with the growth of the city, which is generally very low density. While new roads undertake environmental impact assessments there is no similar assessment of policies such as the pricing of different fuels, such as leaded and unleaded petrol. Similarly there are no strategic views on how to bring about rural electrification at least environmental and economic cost.

F2 INDICATORS TO MONITOR KEY CONCERNS

The indicators suggested in this report are extremely varied and a full description of them is not possible here. This overview attempts to capture the essence of them in four categories:

- Health concerns
- Contribution to development
- Environmental assessments
- Waste and pollution

F2.1 HEALTH CONCERNS

A number of indicators deal with health. Occupational health is a concern in several areas, and some proposals have been made to monitor it, such as monitoring accidents on railways. One key problem with this is that although deaths are monitorable most occupational health problems are more subtle than this and cannot be monitored so easily. There are also indicators relating to HIV/AIDS. This reflects the fact that it is Namibia's most serious problem, and is mainly an urban phenomenon, and so is closely related to the development of secondary and tertiary industries which are mainly based in towns, or require migrant labour.

F2.2 CONTRIBUTION TO DEVELOPMENT

Income from the sectors analysed in this report is being monitored in many ways, so as to assess their contribution to development. Employment and other social indicators separate from income have not been recommended due to lack of data on them. Most indicators relating to development are based on value added (essentially the sum of wages and profits), exports and investment.

F2.3 ENVIRONMENTAL ASSESSMENTS INDICATORS

This set of indicators is based on the monitoring of the use of environmental assessments, audits, environmental management plans and strategic environmental assessments. This helps address environmental concerns from the macro policy level down to individual projects. It also addresses the issue that was identified relating to implementation of recommendations of environmental assessments. This information will be gathered in future from the office of the Environmental Commissioner and will serve as an effective way to monitor new developments. It does not however deal with projects and policies which are already in place.

F2.4 WASTE AND POLLUTION

Waste and pollution indicators are the final set, relating to the physical quantities emitted into the environment. Some of these will be direct measurements of environmental quality, such as compliance to water permit conditions. These are the ideal ones to use when they are available since they measure the problems directly. Others are related to the quantity of pollutants entering the environment, such as the quantities of hazardous waste going to Windhoek dump. The third group monitors inputs that can be reasonably expected to translate to pollutants, such as the amount of leaded petrol sold. The second and third group are problematic in some instances since there is no spatial dimension. A manufacturing process might produce dust and noise that are unacceptable in an urban environment with high population densities, but quite acceptable in a desert environment. Pollution from transport may have negligible effects on a main road, but serious health implications in a town. Hence it is recommended to review these issues in a year or two once the Pollution and Waste management Agency is in place.

F3 USES AND LIMITATIONS OF INDICATORS AND KEY GAPS IDENTIFIED

F3.1 LIMITATIONS

The single largest limitation at present is the lack of data of use in directly monitoring environmental quality. The establishment of the Pollution and Waste Management Agency should in the medium term allow this to be overcome, but in the short term the indicators used should give an approximation of environmental risks. Lack of knowledge on deforestation also presents a problem, since this is the one area where an input may not be sustainably used.

F3.2 USES

The indicators can be used to monitor the various aspects of environmental quality noted above. The first group gives an idea of threats to human health, and deterioration in these indicators calls for action by the Ministry of Health and the Pollution and Waste Management Agency. The second group on indicators of development relates to sectoral issues outside the ambit of the Ministry of Environment. In this case the use is more in monitoring where growth is occurring and then using this information to act proactively. For instance diversification of manufacturing towards chemicals and metals would warrant a more in depth approach of this sub sector, while continued concentration of manufacturing on food processing would warrant increased promotion of the DANCED clean technology approaches. The third group of indicators are linked to environmental assessments. A deterioration in these indicators would require further analysis to find the reasons for non compliance with the Environmental Management Act. This would obviously need to be done in cooperation with the Environmental Commissioner and the Sustainable Development Commission. The fourth group of indicators relates to waste and pollution. A deterioration in these could be due to one of at least three distinct reasons. Capacity of relevant agencies to enforce the law might have fallen leading to lower compliance. Alternatively more intensive monitoring could lead to more

breaches of law being detected without any necessary changes in actual pollution levels. Decentralisation of industry to municipalities with lower capacities or increased economic activity could also lead to worse waste and pollution indicators, even if each establishment is polluting less on average.

F3.3 KEY GAPS

Three key gaps have been identified. Firstly the need for strategic environmental assessments and follow up of environmental impact assessments. This should be dealt with by the Environmental Management Act. Secondly the lack of data and monitoring of pollution and waste. This should be dealt with by the Pollution and Waste Management Act. Thirdly the key role of urban capacity. Many issues relating to human health due to sewage and other waste disposal systems were brought up by stakeholders. Although urban governance is outside the scope of this study there is a need to examine it since it impinges on many of the issues addressed. Most infrastructure is much more cheaply provided in towns than in rural areas so there needs to be a strategic examination of how to manage urbanisation which considers issues such as the desirable patterns of urbanisation, how to manage wastes in towns and urban planning. A separate State of the Environment report on this might be warranted.

F4 PROJECTIONS OF FUTURE TRENDS BASED ON INDICATORS

F4.1 MANUFACTURING AND HUMAN HEALTH

This can be expected to deteriorate slightly in the medium term as manufacturing grows rapidly.

F4.2 MANUFACTURING AND DEVELOPMENT

This can be expected to improve slightly in the medium term as manufacturing grows rapidly.

F4.3 MANUFACTURING AND ENVIRONMENTAL ASSESSMENTS

The forthcoming legislation means that this group of indicators should improve as environmental assessments are undertaken and implemented.

F4.4 MANUFACTURING AND WASTE

Solid waste indicators can be expected to improve as the major solid waste producers in Windhoek implement the ZERI project. Liquid and air waste indicators may deteriorate as more manufacturing takes place, but this will be very much dependent on the enforcement capacity of the relevant agencies.

F4.5 MINING AND HUMAN HEALTH

This can be expected to may be expected to improve if mining continues to decline in the long run, although it may deteriorate in the short run due to large new projects such as Scorpion.

F4.6 MINING AND DEVELOPMENT

This may improve in the short run due to large new projects such as Scorpion, but in the long run can be expected to decline.

F4.7 MINING AND ENVIRONMENTAL ASSESSMENTS

The existing legislation means that this group of indicators should show no strong trends.

F4.8 MINING AND WASTE

This can be expected to may be expected to improve if mining continues to decline in the long run, although it may deteriorate in the short run due to large new projects such as Scorpion.

F4.9 ENERGY AND HUMAN HEALTH

These problems are expected to gradually improve as urbanisation and rural electrification increases access to electricity, and as free availability of biomass energy is diminishing.

F4.10 ENERGY AND DEVELOPMENT

This is expected to be very much dependent on a few major developments such as construction of Epupa and Kudu, both of which are uncertain at this stage.

F4.11 ENERGY AND ENVIRONMENTAL ASSESSMENTS

The current use of environmental assessments and forthcoming legislation means that this group of indicators should continue to show relatively good results.

F4.12 ENERGY AND WASTE

Waste from Van Eck power station has been diminishing with only periodic use of the power station. The decommissioning of Van Eck will reduce this waste to zero.

Emissions from motor vehicles can be expected to increase at a rate between 1% and 6% per year.

F4.13 TRANSPORT AND HUMAN HEALTH

Deaths from transport accidents may be expected to increase in line with road transport trends, unless there is successful safety promotion.

F4.14 TRANSPORT AND DEVELOPMENT

Completion of large infrastructure projects such as the final pieces of the Trans-Caprivi and the Trans-Kalahari plus the large amount of spare capacity on the road, rail and maritime networks mean that recent rapid growth should be sustained.

F4.15 TRANSPORT AND ENVIRONMENTAL ASSESSMENTS

The forthcoming legislation means that this group of indicators should improve as audits are undertaken and compliance rises.

F4.16 TRANSPORT AND WASTE

Waste may be expected to increase in line with road transport trends, unless there is successful improvement in use of public transport.

F5 IMPLEMENTATION ISSUES

F5.1 INDUSTRIAL PROCESSING SECTOR

F5.2 MINING SECTOR

F5.3 ENERGY SECTOR

In the energy sector only information on commercial energy carriers is readily available and provides an overview of the national energy situation. An effort needs to be made, however, to measure and record traditional energy consumption, so that policies targeting the rural household energy situation as well as natural woodland denudation may be implemented.

Regional analysis, as well as distinction between rural and urban scenarios, is not possible at this stage as energy information is not disaggregated in this way. In order to better understand the energy sector and the impact it has on the environment, such disaggregation is necessary and should be encouraged amongst stakeholders. The development of meaningful indicators is dependent on this.

F5.4 TRANSPORT SECTOR

This Report clearly shows that on a policy level much is presently done to address environmental sustainability in the Transport Sector. Although the current legislation still does not reflect this, the new legislation that are either already in Parliament or will follow soon, show a clear commitment to environmental sustainability.

Namibia is a large country with a small population mostly concentrated in certain areas or towns. This leads to largely under-utilised infrastructure in the rural areas. The environmental impact of the development and maintenance operations is also shown to be small. Even in the more populated towns like Windhoek, Oshakati, Ongwediwa, and Ondangwa, infrastructure deficiencies are still small.

On the operational level the report showed that the road sub-sector is by far the most dominant and will remain so for the foreseeable future. Even for the road sub-sector very little has to date been done to address possible negative environmental effects caused by traffic. The present level of traffic flows is still too small to cause significant environmental problems.

However on an operational level, the issues of safety and health are already standing out as concerns that need to be addressed in the medium term.