

EXECUTIVE SUMMARY

A INTRODUCTION TO THE INDUSTRIALISATION ENVIRONMENT

B INDUSTRIAL PROCESSING ENVIRONMENT

INDUSTRIAL DEVELOPMENT

Overview

This Study has reviewed the Industrial Processing Sector in Namibia with a view to develop meaningful indicators with which to measure trends that may affect the Environment in its broadest terms. As a first step, the Sector as a whole was studied with the aim to determine its size and makeup.

The Namibian industrial base is found to be small and dominated by three sub-sectors. About 42% of all large companies are found in the food and beverages sub-sector while 15% and 10% respectively are found in the Metal products, machinery and equipment and the Non-metallic mineral products sub-sectors.

Growth in the fish-processing sector is extremely variable while the rest of the sector shows a fairly constant growth pattern mainly driven by domestic demand. The food and beverages sector is dominated by a small number of companies that are presently expanding production to satisfy export demand, mainly to South Africa.

On Government level the expansion of this sector is recognised as important. Export Processing Zones have been created in Oshikango, Walvis Bay, Windhoek, Swakopmund, Keetmanshoop, Mariental, Tsumeb and Okahandja. Investment interest from the private sector has to date been reasonable and some 58 companies have created about 1300 jobs through investments here.

The study found very little information on Small and Medium Enterprises other than previous estimates that point to a GDP contribution of 2-3%. These companies rarely enter the government statistics as taxpayers or employers. The MTI conducted a study in the four O-Regions and found that the about 5 100 SME's employ about 33 000 people.

With these conclusions this Study concluded that it would be most feasible to concentrate on the Food Processing Sector and the waste products generated by other sectors.

Policy and Legal Framework

The Ministry of Trade and Industry is very active in promoting an environment conducive to investments in this sector. These policies, bills and Acts all focus on providing such incentives and are silent on environmental concerns. Currently the only policy of major importance is the Environmental Assessment Policy of the Ministry of Environment and Tourism. This focuses on impact assessments.

A more strategic approach will be forthcoming once the Environmental Management and the Pollution and Waste Control Bills are promulgated. The Agencies to be created through these bills will manage and regulate pollution in an integrated way.

Raw Materials Usage

The study found little data on the quantities of raw materials used for each sub-sector. The key raw materials are fish, meat, water, wood, metals and electricity. All are used without serious problems. The only raw material for which there is no data and where there could be a sustainability problem due to over-utilisation is wood.

INDUSTRIAL PROCESSING

The study found that most of industry is found in and around Windhoek and Walvis Bay, with small concentrations at Swakopmund and Okahandja. The market potential of the Ondangua-Oshakati area has not resulted in major developments there. The study also found natural reason for this situation to change in the medium term.

The study further found that only one chemical produced in Windhoek is environmentally threatening. The internal monitoring systems of this international company are such that product transport and storage is done according to international regulations. In the remainder of the processing environment very few issues of environmental concern are eminent beyond employee health and safety.

INDUSTRIAL WASTE MANAGEMENT

The study was able to categorise the industry by type and by waste product. This will assist future town planning and zoning taking environmental concerns into account. The Municipalities are responsible for solid waste disposal. Their general waste management is extremely poor.

There is no legislation to monitor the waste management systems of both industry and the municipalities. The only waste products that are continuously monitored are water-borne wastes. These affect human health and there is a stringent system of compliance. Non-compliance has in the past been tested in court. For other types of waste the study concluded that the future Pollution Control and Waste Management Act would provide the required guidelines in this regard.

CONCLUSIONS

The study concludes that the development of the manufacturing industry in Namibia is at an early stage with most processing done in the foods and beverage sector. The size of the sector, the types of industry and the types of products produced in Namibia do

not contribute significantly to environmental concerns. The industry is also highly concentrated which will make future management of environmental issues once the Environmental Management and the Pollution Control and Waste Management Bills are promulgated, easy to implement.

Of concern is the lack of data and the fact that industry in general have not been subject to environmental impact assessments due to lack of legislation. The new Bills should cover both concerns.

C MINING ENVIRONMENT

D ENERGY ENVIRONMENT

Energy consumption

Namibia's energy consumption is being dominated by the transport sector which accounts for about 75% of total commercial energy consumption at present. The trend since Independence suggests that the transport sector's share is bound to increase further, which indicates the significance of the service industry in Namibia.

Electricity consumption is increasing gradually. The slow growth is due to a decline in the mining industry, a steady rise in local authorities' consumption and a moderate increase in rural consumption. Electricity consumption for industrial processes is almost negligible at this stage.

Non-commercial (mainly traditional) energy consumption figures are not readily available if at all. The White Paper on Energy Policy suggests that biomass consumption could be as high as 14% of the country's total energy consumption, while the use of solar energy is at present estimated at 1% of total consumption.

Household energy consumption patterns, particularly in rural areas, are not well researched and would have to be studied in detail if consideration is to be given to alleviating dependence on biomass fuels. In urban areas electrical load peaks (which are normally due to simultaneous household consumption in the evenings) may be avoided by demand side management measures and the replacement of energy intensive electrical appliances with other energy sources (eg. solar water heaters and cooking appliances using gas).

Commercial energy is still relatively cheap in comparison with other countries, due to subsidisation by government to promote certain policy goals. This is a barrier to the promotion of renewable energy technologies like wind farms, solar home systems and solar water heaters.

Environmental impact

Although energy is central to the provision of goods and services, to production in mining and industry, to transport, to comfort and livability in the domestic context, the generation and use of energy have some negative consequences for the environment. The extent and magnitude of such environmental impacts are determined by the sources of energy and can limit sustainable growth if kept unchecked. As in many other developing nations, energy use in Namibia is increasing at a rate which may be unsustainable in the long term. To counteract this trend, Governments would initiate programmes to encourage implementation of efficiency measures to reduce energy consumption and environmental impacts. Such programmes may involve fuel substitution, education and awareness creation, implementation of improved technologies, promotion of renewable energy technologies, and reform in the energy

sector. All of these programmes are addressed to some extent in the White Paper on Energy Policy (indicators will provide inter alia a measure of the success of such programmes). However, energy efficiency is not yet a high priority in Namibia as the basic energy needs of poorer sections of society still remain to be met.

Energy consumption in Namibia is sourced mostly from fossil fuels (roughly 18% from coal¹ and 63% from oil). Each fuel imposes a different load on the environment and emits different quantities of greenhouse gases per unit of energy consumed. In the case of imported electricity the emissions that are due to Namibia's consumption occur in South Africa. While Namibia does not directly feel the consequences of these emissions it is still our responsibility in a global context. The same argument applies for oil refining which is not yet performed in Namibia.

Present emissions from motor vehicles are negligible by international standards. The recent introduction of lead free fuel is a step towards decreasing lead emissions. A further step towards curbing noxious emissions would be the introduction of catalytic converters for motor vehicles.

The development of the Kudu Gas field and power generation from a combined cycle gas turbine plant would make Namibia self-sufficient in terms of electricity consumption. Being the least emitting fuel compared with coal and oil, natural gas should therefore be favoured as a source of energy.

The increasing use of renewable energy sources like solar, wind and water energy will ease environmental impacts vis-à-vis the greenhouse effect. These energy sources, however, have other environmental impacts such as visual impact, noise pollution (wind turbines) and being a threat to local bird life (wind turbines). Hydro-electric power plants that require water storage capacity have substantial environmental impact on the flooded area. The use of biomass as an energy source is also considered renewable as long as the biomass is grown sustainably. Unfortunately, the increasing deforestation and desertification in some parts of the country indicates that biomass is not used sustainably in Namibia. While under sustainable circumstances CO₂ emissions from biomass are balanced by CO₂ uptake when the biomass is grown, other emissions affecting air quality are reduced, but not eliminated.

The cost for most renewable energy technologies is currently only competitive in niche markets where conventional energy costs are high. Although economies of scale that would improve the competitive position of these technologies may not be achieved in Namibia due to its small population, Namibia's energy policy puts substantial emphasis on the promotion of such technologies which implies that the Government may consider subsidisation.

Outlook

¹ It is assumed here that 90% of the electricity imported from South Africa is produced from coal-fired power stations.

It is clear from the incoherent information that the energy sector in Namibia is not yet geared for environmental monitoring and analysis. With this State of the Environment Report the foundation has been laid but meaningful trend monitoring can only occur once the maintenance of a comprehensive energy data base has been ensured. To facilitate the future monitoring of trends using the proposed key indicators, it is crucial that a strategy be implemented for the gathering and compilation of energy information and data in suitable formats that would enable sectoral and regional disaggregation as well as rural-urban split. It would be advantageous if all information can be obtained from a single source, namely the Ministry of Mines and Energy.

The DEA is encouraged to agree with the MME on a standard set of information that is required to update the indicator data tables annually. An annual deadline for the submission of the required data should also be set. These are the main challenges that lie ahead.

E TRANSPORT ENVIRONMENT

Overview

The Ministry of Works, Transport and Communication (MWTC) is on behalf of Government responsible for developing policy and regulating the transport sector. The Namibian transport sector consists of four main modes or sub-sectors all included in this study, namely Roads, Railways, Aviation and the Maritime modes. Namibia does not have inland waterways or pipelines for bulk transport of goods.

The road sub-sector is by far the most important sub-sector. With Namibia's small population and large land area the roads network forms the primary means of access to outlying parts of the country and contact between communities. This sector still has significant available capacity with about 140 000 registered vehicles utilising a national road network of about 43 000 km 72% of which are good quality gravel or paved roads.

The railway sector is in decline and during the last two decades traffic volumes decreased significantly. The aviation and maritime sub-sectors are very small and like the other two sub-sectors, a significant amount of capacity is available.

Since Independence the Transport Sector has been the subject of a comprehensive review of government policy and involvement. Before Independence the railway operations were commercialised while the two ports were taken up in Namport. The Namibian Airports Company has in February 1999 taken over the management and operation of the eight largest airports in Namibia. The road Sub-sector will shortly be restructured with a new Road Fund Administration managing a road user charging system aimed at providing sustainable funding for roads, a Road Authority and a Road Contractor Company. The Road Authority will in future manage the road network while the Road Contractor will take over all road maintenance activities currently still undertaken by the Government.

Current activity

As already mentioned, the study found that all four sub-sectors have significant capacity. The road sub-sector is the most dominant and much effort was put in to extract relevant data. The transport sector consumes about half of the energy needs of Namibia, but due to low concentration levels, the normal environmental concerns like emissions, lead content of fuel, disposal of tyres or even accidents and casualties, are not seen as of major importance.

Windhoek is the only city/town with a sizable vehicle population, currently estimated at around 55 000, but there are still no signs of congestion or emission problems. Traffic flows are smooth while the municipality has already planned improvements to the roads network based on traffic growth studies.

With the other three sub-sectors the levels of activity are so low that the development of meaningful indicators is barely possible.

Although estimates for the different types of information do exist, some are so unreliable for example road accident statistics, that the managers of the data are stating its unreliability. In other examples like fuel sale statistics, the industry and the Ministry databases differ although all data comes from the industry.

Current environmental effects and concerns

The Transport Sector does not contribute significantly to environmental problems in Namibia and is by world standards playing an insignificant role. A recent study on climate change went as far as stating that Namibia should be classified as a carbon sink that is, the Namibian environment is absorbing more carbon than what is produced as emissions by all. The road sub-sector will be the first to experience the negative effects of pollution, but the study concludes that this will not happen in the near future.

All sub-sectors make use of environmental impact assessments as part of the planning process for all new projects, but little is done to ensure that the long-term effects of project implementation are monitored. No environmental awareness system is in place to manage maintenance inputs. With all the new enabling legislation the environment plays a major role and it is foreseen that this sector will develop the necessary plans to manage maintenance inputs as soon as the new entities are established.

Summary and conclusions

This Report clearly shows that on a policy level much is presently done to address environmental sustainability in the Transport Sector. 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. The issues of safety and health are however already standing out as concerns that need to be addressed in the medium term.

F CONCLUSION AND OUTLOOK

MAIN ENVIRONMENTAL CONCERNS

Urbanisation and agglomeration

Three of the four sectors - manufacturing, road use and energy provision - are concentrated in particular geographical areas. The mining sector is not. Certain sub-sectors also dominate: food processing within manufacturing, roads in transport, liquid fuels and electricity in energy, diamonds in mining. This can have important implications for environmentally sustainable development. Related to spatial concentration, is a strong need for strengthening and supporting local authority capacity in the key economic centres. Windhoek and Walvis Bay have experienced municipal authorities that are already dealing with many of these issues, and who require less support than, for example, the emerging Oshikango-Oshakati-Ondangwa economic centres. Secondly, the concentration on particular activities within each sector means that there is scope for interventions on the model of the DANCED support to the fish processing industry.

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 specific large projects such as Scorpion Zinc or Kudu gas. There is also potential capacity for growth, particularly in the transport sector that 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.

Sustainability of inputs

A high proportion of all inputs are imported, and cause very few (if any) problems for sustainable use of Namibia's own natural resources. There are two major exceptions, namely 1) woodfuel use which is still poorly understood because of lack of data and information, and 2) water use in processing, with the mining industry the only large user at present. The mining industry in areas such as Rössing can afford to pay the long-term cost of water from desalination. As some manufacturing concerns that (like the meat and fish processors and the breweries) are expected to grow substantially, it is recommended that they be monitored by the project in the context of water, rather than manufacturing. There is ample evidence that manufacturing can pay the full economic (involving environmental) costs of water.

Wastes

Wastes and potential pollution from them are one of the key issues identified by this study. With the exceptions of the particular sectors mentioned in the study where there are specific waste problems, waste management must be rather general. The types of waste produced range 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 co-operation between the key municipalities and the envisaged Pollution and Waste Management Agency.

Environmental impact assessments and strategic environmental assessments

A notable fact is that while there have been environmental assessments for most large projects in these sectors of the industrialisation environment, 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 (in)ability of the responsible agencies to monitor compliance to legislation.

At a 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, strategic issues generally receive scant attention. 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 become substantial in future with growth. While new road developments undertake environmental impact assessments, there is no similar assessment of policies such as the pricing of different fuels, for example leaded and unleaded petrol. Similarly there are no strategic views on how to bring about rural electrification with the least environmental and economic cost.

INDICATORS TO MONITOR KEY CONCERNS

The indicators suggested in this report are extremely varied. Their essence is captured in four categories:

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

Health concerns

Occupational health is a concern in several areas and proposals have been made to monitor it. A key problem is that, although deaths can be monitored, most occupational health problems are more subtle and cannot be monitored so easily. Indicators relating to HIV/AIDS have been proposed, as this is Namibia's most serious problem.

Human health related to manufacturing can be expected to deteriorate slightly in the medium term as manufacturing grows rapidly.

Human health as related to mining can 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. Health of small miners can be expected to remain poor and fatalities to continue as long as poor mining practices are used.

Human health problems related to energy or lack thereof are expected to improve gradually as urbanisation and rural electrification increases access to electricity. As free availability of biomass energy is diminishing, and all but the poorest convert to electricity, respiratory diseases will decrease for most Namibians.

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

Contribution to development

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

Overall development of Namibia can be expected to improve slightly in the medium term as manufacturing grows rapidly.

Development based on mining may improve in the short term due to large new projects such as Scorpion, but in the long run can be expected to decline.

The contribution of energy to enhanced development is dependent on a few major developments such as construction of Epupa and Kudu, both of which are uncertain at this stage.

Completion of large infrastructure projects, such as the final sections 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 of development in Namibia based on transport should be sustained.

Environmental assessments

These indicators (based on monitoring the use of environmental assessments, audits, environmental management plans and strategic environmental assessments) address environmental concerns from the macro policy level down to individual projects. They also address the issue of implementation of environmental assessment recommendations. 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. These indicators do not deal with projects and policies that are already in place.

When the forthcoming legislation is enacted, values of manufacturing indicators should improve as environmental assessments are undertaken and implemented and resultant recommendations are enforced and audited.

The presence of the draft Environmental Management Act means that indicators relating environmental assessments to mining should show no strong trends in the future.

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

The forthcoming legislation means that values from transport indicators should improve as audits are undertaken and compliance with regulations and recommendations rises.

Waste and pollution

Waste and pollution indicators relate to physical quantities of waste emitted into the environment. Some of these indicators will be direct measurements of environmental quality. These are ideal indicators to use, when they are available, since they measure the problems directly. Others are related to the quantity of pollutants entering the environment. The third group of indicators monitors inputs that can be reasonably expected to translate to pollutants. The second and third groups are problematic in some instances since there is no spatial dimension. Hence it is recommended to review these issues and revise the indicators in a year or two once the Pollution and Waste Management Agency is in place.

Values for solid waste indicators can be expected to improve as the major solid waste producers in Windhoek implement ZERI processes. Liquid and air waste indicator values may deteriorate as more manufacturing takes place, but the extent will depend on the enforcement capacity of the relevant agencies.

The relationship of mining to waste may be expected to improve if mining continues to decline in the long run, although it may deteriorate in the short term due to large new projects such as Scorpion.

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 production rate to zero.

Emissions from motor vehicles are expected to increase at between 1% and 6% per year.

Waste generated by transport may be expected to increase in line with road transport trends, unless there is a significant change in the types of transport used and a significant improvement in, and increased use of, public transport.

USES AND LIMITATIONS OF INDICATORS AND KEY GAPS IDENTIFIED

Limitations

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

Uses

Indicators can be used to monitor various aspects of environmental quality. The first group of indicators highlights threats to human health, and deterioration in these indicators calls for action by the Ministry of Health and Social Services and the Pollution and Waste Management Agency. The second group of indicators of development relates to sectoral issues outside the ambit of the Ministry of Environment and Tourism. In this case the value for the MET is more in monitoring where growth is occurring and then using this information to act proactively. The third group of indicators is linked to environmental assessments. Deterioration in these indicators would require further analysis to find the reasons for non-compliance with the Environmental Management Act. This would need to be done in co-operation with the Environmental Commissioner and the Sustainable Development Commission. The fourth group of indicators relates to waste and pollution. Deterioration in these could be due to one of at least three 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 changes in actual pollution levels. Decentralisation of industry to municipalities with lower oversight capacities or increased economic activity could also lead to poorer values from waste and pollution indicators, even if each establishment is polluting less on average.

Key gaps

Three key gaps have been identified. First, there is a need for strategic environmental assessments and particularly for follow up of environmental impact assessments. This should be dealt with by compliance with the Environmental Management Act. Secondly, the lack of data and monitoring of pollution and waste is a concern. This should be addressed by compliance with the Pollution and Waste Management Act. Thirdly, there is 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 during this study. Although urban governance is outside the scope of this State of the Environment report, it should be considered as it impinges on many of the issues addressed. Most infrastructure is provided more cheaply in towns than in rural areas so there needs to be a strategic examination of how to manage urbanisation. A separate State of the Environment report on urbanisation might be warranted.

IMPLEMENTATION ISSUES

Industrial processing sector

This sector does not have coherent legislation to manage environmental concerns. The only policy of major importance the EAP of the Ministry of Environment and Tourism. The promulgation of the new Environmental Management Act is urgently necessary.

A second and far more important issue than creating legislation is the establishment of an enforcement agency.

The industrial processing sector would benefit from an up-to-date data base covering all industries, and being broken down into individual companies and their waste products. While the industrial environment is still small, this will ensure that the envisaged pollution control and waste management agency will be able to place industry in categories of environmental importance and to monitor the potentially more serious polluters.

Mining sector

Energy sector

Only information on commercial energy carriers is readily available and provides an overview of the national energy situation. However, traditional energy consumption needs to be measured and recorded, 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.

A strategy must be put in place to ensure the gathering and compilation of meaningful energy information and data in appropriate format for trend monitoring. The data for the various energy carriers must be compatible so that aggregation into a national energy picture is possible.

Transport sector

On a policy level much is being done to address environmental sustainability in the Transport Sector. Although the current legislation does not reflect this, the new legislation will 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 remain minimal.

On the operational level, the road sub-sector dominates the transport sector and will continue to do so for the foreseeable future. However, 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 flow appears to be too small to cause significant environmental problems. On an operational level, however, the issues of safety and health are already prominent as concerns that need to be addressed in the medium term.