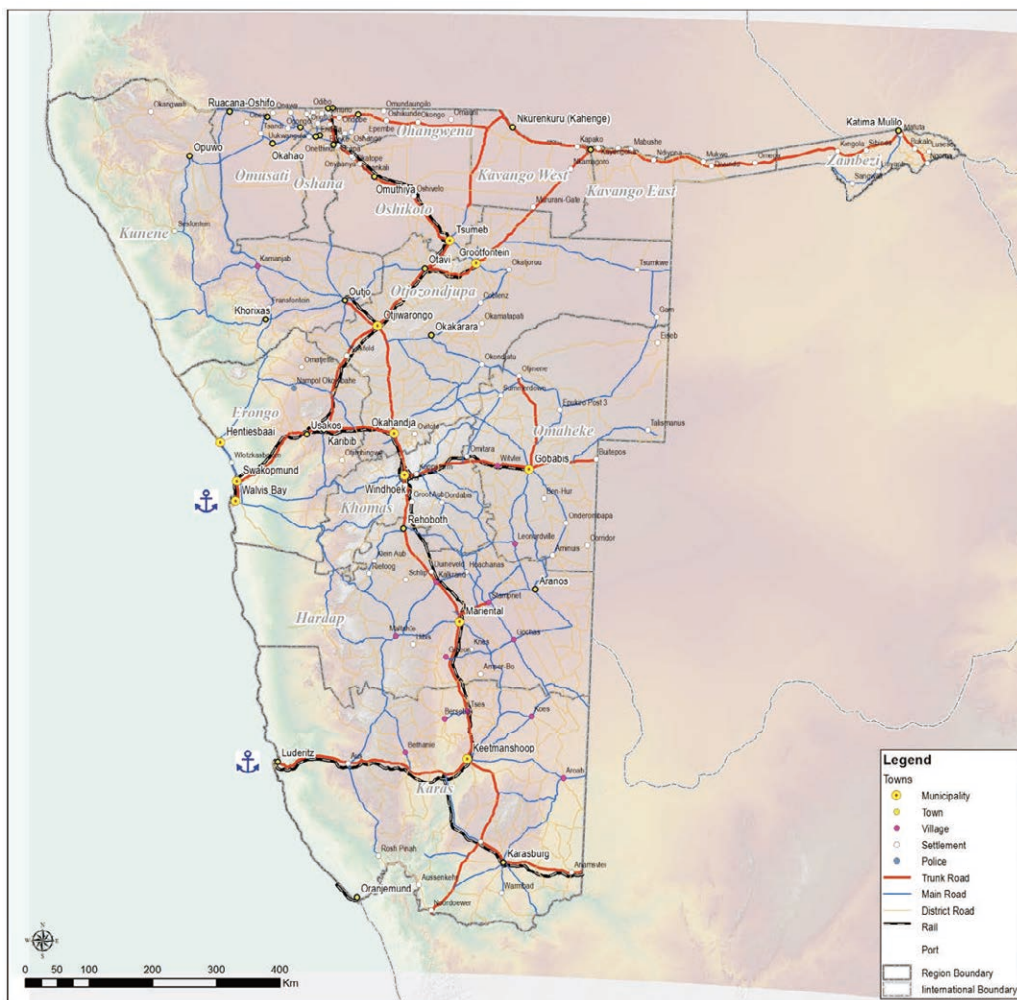


## 5. Urban and Town Development

### 5.1 Town distribution in Namibia

The population density of Namibia is 2.5 persons/km<sup>2</sup>, which was comparatively low in the world. Windhoek is the only urban area with a population exceeding hundred thousand. The population of only 16 towns exceed the 10 thousand mark. The following figure shows the urban population distribution in Namibia. Many of the towns are physically independent, except some towns located in the northern regions.



Source: JICA Study Team

Figure 5.1: Urban area distribution in Namibia

**Table 5.1: Increase of Urban and rural population**

Category		1991	2001	2011
Urban	Population	382,680	603,612	903,434
	Growth Rate	-	4.7%	4.1%
Rural	Population	1,027,240	1,226,718	1,209,643
	Growth Rate	-	1.8%	-0.1%
Total	Population	1,409,920	1,830,330	2,113,077
	Growth Rate	-	2.6%	1.4%
Urban Population Ratio		27%	33%	43%

Source: National Housing Census

Table 5.1 indicates that the urban area is an engine for population increase of Namibia. A four per cent urban population growth ratio is generally high. Local authorities are required to manage industry promotion for labour force and developing housing area, related infrastructure in accordance with the town plan.

**Table 5.2: Increase of town population from 1991 to 2011**

Name of Town	1991	2001		2011	
	Population	Population	Growth ratio	Population	Growth ratio
<b>Municipalities</b>					
Windhoek	141,562	233,529	5.1%	325,858	3.4%
Swakopmund	-	23,808	-	44,275	6.4%
Walvis Bay	21,249	43,611	7.5%	62,096	3.6%
Hentiesbaai	-	3,285	-	4,720	3.7%
Omaruru	-	4,761	-	6,300	2.8%
Mariental	-	9,836	-	12,478	2.4%
Keetmanshoop	13,643	15,778	1.5%	20,977	2.9%
Gobabis	-	13,856	-	19,101	3.3%
Tsumeb	-	14,929	-	19,275	2.6%
Groot fontein	-	14,249	-	19,632	3.3%
Okahandja	-	14,039	-	22,639	4.9%
Otjiwarongo	15,921	19,614	2.1%	28,249	3.7%
<b>Major Towns</b>					
Katima Mulilo	12,599	22,134	5.8%	28,362	2.5%
Rundu	26,145	36,964	3.5%	63,431	5.5%
Lüderitz	-	12,537	-	13,295	0.6%
Rehoboth	21,439	21,308	-0.1%	28,843	3.1%
Ondangwa	-	10,900	-	22,822	7.7%
Ongwediva	-	10,742	-	20,260	6.6%
Oshakati	21,603	28,255	2.7%	36,541	2.6%

Source: National Housing Census 2011

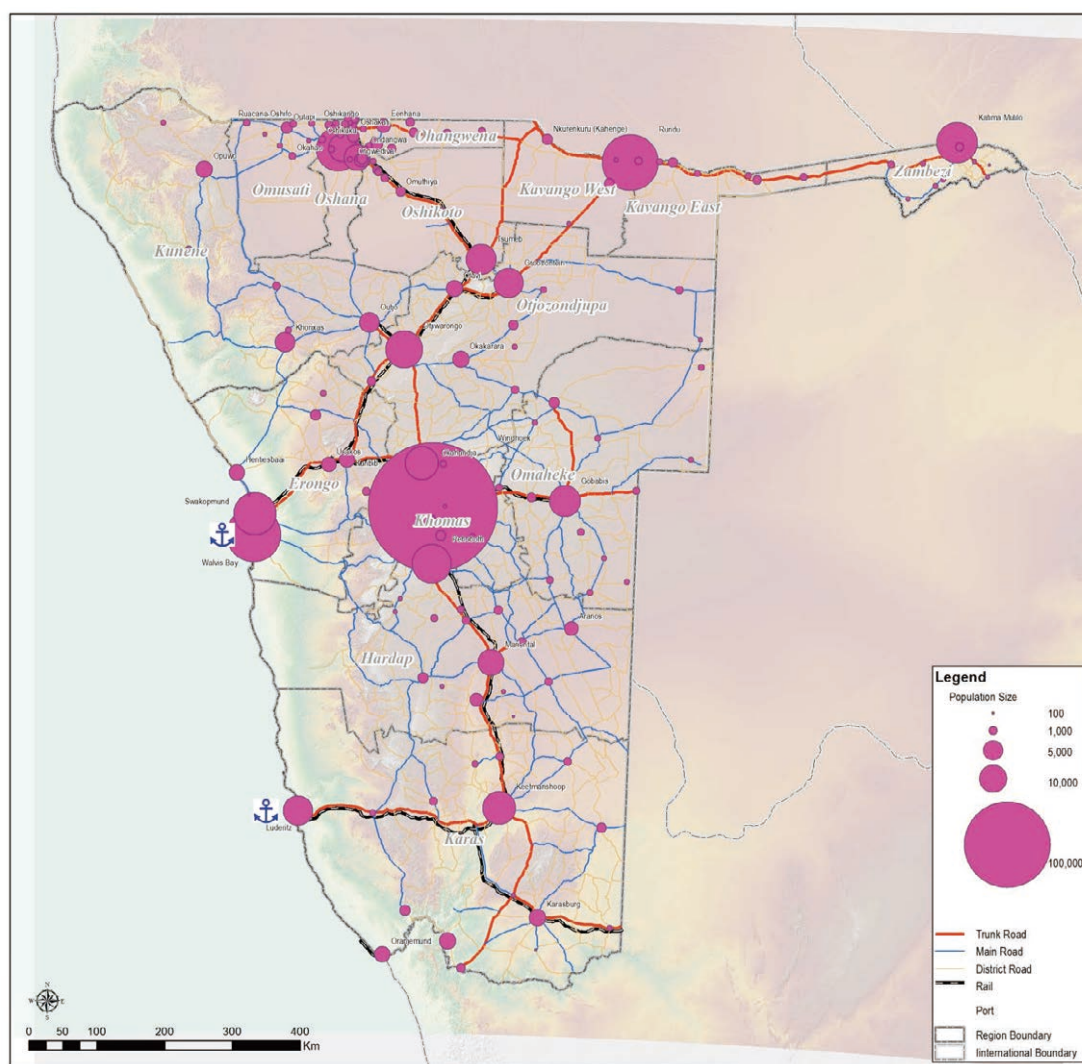
As shown in Table 5.2, population in some of towns increases drastically after 2001. The average growth ratios of Swakopmund, Rundu, Ondangwa and Ongwediva were higher than 5%. It also shows that the increase in northern towns along the border is significant.

The populated area is categorized into four groups. Those are municipality, town, village and settlement. Municipalities and towns each have autonomous local government. The number of the populated areas is summarized in Table 5.3.

**Table 5.3: Number of urban areas by regions**

Region	Number of municipalities	Number of towns	Number of Villages	Number of settlements	Total
Kavango (East & West)	0	2	0	2	4
Ohangwena	0	2	0	3	5
Omusati	0	4	0	4	8
Oshikoto	1	1	0	5	7
Oshana	0	3	0	2	5
Kunene	1	2	1	3	7
Otjozondjupa	3	2	0	8	13
Omaheke	1	0	2	7	10
Erongo	4	3	0	4	11
Khomas	1	0	0	4	5
Hardap	1	2	5	3	11
Karas	1	2	5	6	14
Zambezi	0	1	0	1	2
<b>Total</b>	<b>13</b>	<b>24</b>	<b>13</b>	<b>52</b>	<b>102</b>

Source: Ministry of Regional and Local Government and Housing and rural development



Source: Study Team Prepared from the Population & Housing Census 2011

**Figure 5.2: Urban population distribution in Namibia**

#### **5.1.1.1 Northern area**

In the northern area, both middle class towns and municipalities are located. The number of settlements is also observed because population density there is relatively high compared with other areas. Oshikango and Rundu are located to the northern border to Angola, while Katima Mulilo is located close to Zambia to the east.

In the maize triangle, it is also noted that there are two municipalities (Grootfontein and Tsumeb) and one town (Otavi) is located nearby. This location is the junction to the Zambia and Angola routes.

#### **5.1.1.2 Central area**

On the west coast, two 1st grade municipalities are within 30 km of each other. These are Walvis Bay and Swakopmund. Walvis Bay is located in a strategically important position in terms of logistics with its competitive port.

Some of the municipalities and towns are along the corridors to the borders of Angola, Botswana and Zambia. Those towns are Karibib, Usakos, Omaruru, Otjiwarongo, Okahandja and Gobabis .

#### **5.1.1.3 Southern area**

Due to the low population density, all the towns are isolated with small populations. Lüderitz could have a logistic role because of its port, while Keetmanshoop is located on the junction between the north, Luderitz Port and South Africa.

### **5.2 Spatial development framework**

Local government units in Namibia are classified into two categories. The upper ones are regions and the lower ones are municipalities and towns. Villages and settlements are not autonomous bodies and belong to the region. There is no legislation about national and regional land-use planning frameworks in Namibia. Karas Region and Kavango Region (East and West) are exceptional cases that prepared land use plans as an exercise. However, those have not any legal authorization. Currently, the Urban and Regional Planning Bill is being drafted which includes preparing coherent land-use plans at national, regional and local level.

Hence, town planning schemes are the only legislated form of land-use planning in Namibia.

#### **5.2.1 Town planning schemes**

Town planning schemes were legislated by the Town Planning Ordinance of 1954, Township & Division of Land Ordinance of 1963 and the Local Authority Act of 2007. These provide the basic framework for town planning schemes. Characters are summarized in following. Summary of town planning scheme is summarized in Table 5.4.



**Table 5.4: Summary of town planning schemes in Namibia**

Items	Contents
Target Town	Aroab, Aus, Bethanie, Gibeon, Gobabis, Grootfontein, Karibib, Keetmanshoop, Klein Windhoek, Luderitz, Maltahohe, Mariental, Okahandja, Omaruru, Otjiwarongo, Outjo, Rehoboth, Swakopmund, Tsumeb, Usakos, Walvis Bay, Warmbad, Windhoek
Planning Area	Should be defined in the scheme within the jurisdiction area
Planning Objects	<ul style="list-style-type: none"> <li>- Road (Width, Grades Intersections, right of way etc.)</li> <li>- Lighting</li> <li>- Water Supply</li> <li>- Sewerage, Drainage and Sewerage disposal</li> <li>- Reservation</li> <li>- Control of advertisement, public view</li> <li>- Disposal Land</li> <li>- Agriculture</li> <li>- Erf (Plot, Piece of land) shall be included in the scheme</li> </ul>
Zoning	Residential, business, industrial and others. Details might be set in a scheme
Possible regulation for building	<p>Following can be restricted:</p> <ul style="list-style-type: none"> <li>- Number of the buildings</li> <li>- Spaces</li> <li>- Size, height, design, external appearance</li> <li>- Operations</li> <li>- Building structures</li> </ul>
Subdivision	Sub-division shall not to be approved if detailed plan was not in the town scheme.
Reflection from the stakeholders' opinion.	<p>Following three organizations shall be formed.</p> <p>1) Town Planning Committee: This is formed to prepare a town planning scheme.</p> <p>2) Namibia Planning Advisory Board Roles are represented listed below</p> <ul style="list-style-type: none"> <li>- A board shall advise to the local authorities</li> <li>- A board shall submit recommendation and advise to the minister after the application submitted.</li> </ul> <p>The minister of local government shall appoint board members. Usually, it consist of Primary Secretary from relevant ministries</p> <p>3) Hearing Public hearing shall be also required before board prepare presentation.</p> <p>4) Approval Minister approves based on the advice prepared by the Namibia Planning Advisory board.</p>
Coordination with relevant sector and regional level	As written in the above "Planning objects", a scheme includes some basic infrastructure. In addition, the board function as a coordination body since members are from different ministries.
Target Period	Five years
Control and Enforcement Measures	<ul style="list-style-type: none"> <li>- When land owner transfer an erf, deed registration is required. A deed registry confirms and notice town planning scheme to applicants at the same time.</li> <li>- Once building application is submitted, this will be inspected not only building inspector but also relevant sector's expertise.</li> </ul>
Expropriation of land	With the prior approval of minister, owner of the town planning scheme follow the process under the provisions of the Expropriation of Lands Ordinance, 1927

Source: Study Team

## 5.2.2 Issues related to town planning schemes

### 5.2.2.1 Low update frequency

The town planning schemes are obliged to be updated every five years. The reality, however, is that most of the town planning schemes have not been not updated for many years although the population growth was rapid and towns developed drastically. Consequently most of the towns face urban problems. One example is that housing for low-income families spread into unplanned areas.

### **5.2.2.2 Technical skills**

In general, local authorities face a lack of technical personnel due to low salaries and limited numbers of experts. In order to solve the latter problem, the Ministry of Local and Regional Government and Housing and Rural Development (MLRGHRD) plans to establish an education course in collaboration with the Polytechnic.

## **5.3 Urban development plans for Walvis Bay**

### **5.3.1 Land use plan of Walvis Bay Municipality**

One of the most important factors in identification of a potential location of the Logistics Hub Centre is the land use plan of Walvis Bay Municipality. The town planning scheme of Walvis Bay was formulated in 1997. After 14 years, work on a new plan commenced in 2011. Currently the plan is in the final draft stage as of June 2014. The name of the plan is “Integrated Urban Spatial Development Framework (IUSDF) for Walvis Bay”. The following is a summary of the plan.

#### **5.3.1.1 Selection of development scenario**

At the initial stage of planning, three types of development scenarios were studied and compared. These are as listed below. The choice of scenario differs regarding the volume, characteristic, and structure of the town.

- Primary Industrial City: Maximum potential reached through port expansion
- Constrained Industrial City: Potential reached through limited port expansion
- Resort Town: Concentration on residential and tourism activities

Eventually the "Primary Industrial City" scenario was adopted as the concept for the town planning scheme.

#### **5.3.1.2 Population projection**

In 2011 the population was about 60,000 based on the National Housing and Population Census. The informal population, which was not included in the census, was estimated to be 18,000 according to the municipal survey. For this plan, the total population was estimated as 78,000 in 2011. The population projection was made based on this figure and the trend of population growth in the past. In the projection, the future population growth rate was set at 4% adopted from the past average growth rate. As a result, the population in 2030 is estimated to be over 180,000, which is twice the current population. This implies that the area of the town should be expanded to more than double the present as well.

### 5.3.1.3 Development axis

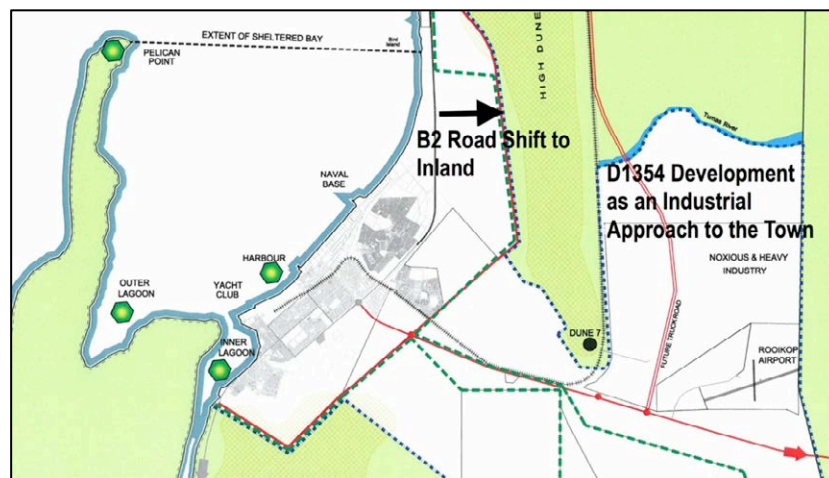
Although the population density of the area is generally said to be low, there are many constraints for development in Walvis Bay town as listed below.

- The town is surrounded by the Dorob National Park and the Dune Preservation Area that limits the room for expansion.
- There is no more room for expansion in the northern part of town due to the existing low-cost housing and planned “North Port Development” by Namport.
- Walvis Bay Lagoon, a registered wetland under the Ramsar Convention is located in the south.
- Due to weak soil bearing capacity of the sandy soil, foundation costs may rise should high-rise buildings be constructed. Consequently, it is difficult to establish high-density residential areas.

Consequently, the direction of development will be limited towards the east.

### 5.3.1.4 Road development network

Given the development plan for the North Port and projected population increase, the backbone road network must be restructured. The current coastal B2 road needs to shift inland. The new B2 road is planned to be used as a tourism road. Instead, D1354 behind the dunes will be upgraded to serve industrial use such as heavy trucks.

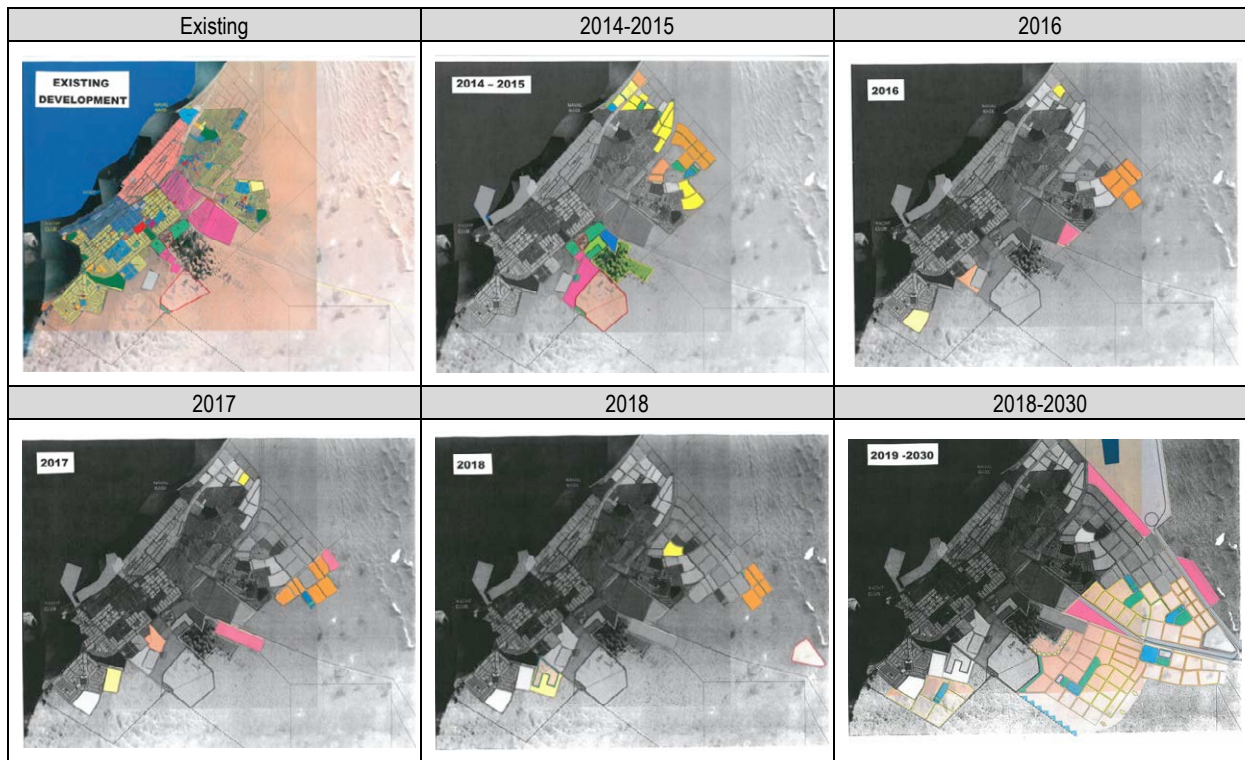


Source: Prepared by Study Team from IUSDF document

**Figure 5.3: Restructuring of road network**

### 5.3.1.5 Overall land use

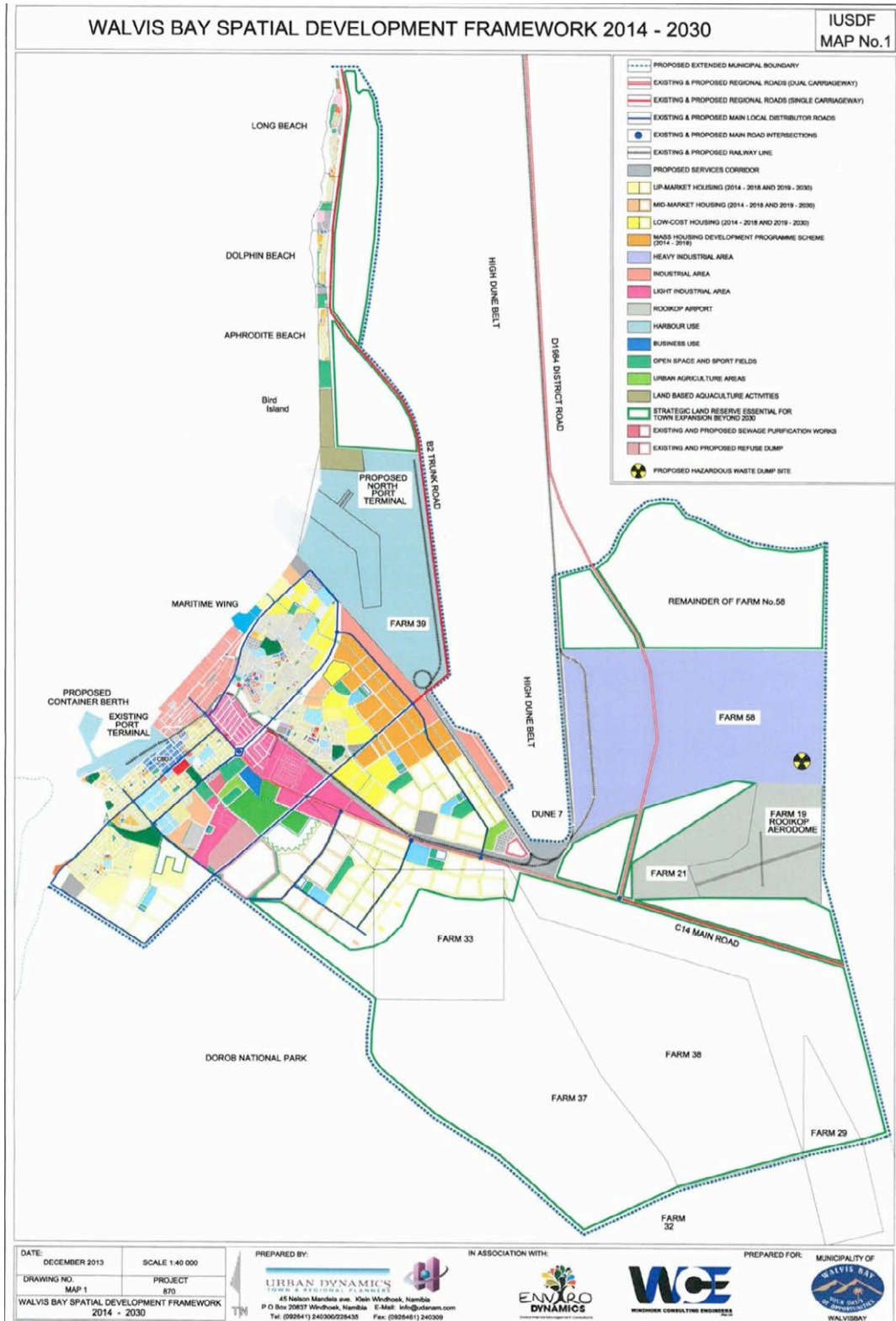
In accordance with the population increase, the development area will expand gradually in the town development plan as shown in Figure 5.4.



Source: Integrated Urban Spatial Development Framework (IUSDF) for Walvis Bay

**Figure 5.4: Concept of phased development**

Figure 5.5 shows overall land-use map prepared by IUSDF. The area of the town will expand more than double according to the plan.



Source: IUSDF

Figure 5.5: Land use map

### 5.3.2 Industrial zone development in Walvis Bay

The key project or industrial development related to logistics is summarized in this section. The existing area allocated for industrial land is about 300ha, while the planned industrial area is estimated to exceed 3,000ha. Priority will be given to the area adjoining to the port, since this is a prime location for logistics operators and with the highest potential to attract FDIs. However, the possibility to acquire additional land for industry is limited along the coast, therefore the municipality decided to extend the industrial zone inland. This area will be large enough to accommodate logistics operators and related industries. In addition, behind of the Dune belt land is allocated for new heavy industries. “Farm 58” is the biggest plot of land. Two corridors are planned to connect North Port and the industrial areas. These corridors can accommodate dedicated roads, railways and conveyors.

#### 5.3.2.1 Farm 58

Adjacent to Walvis Bay Airport, 2,800 hectares of land is available for industry as shown in Figure 5.6. Expressions of interest for this area were submitted by 17 private firms as summarized in Table 5.5.

**Table 5.5: Companies that are interested in development of Farm 58**

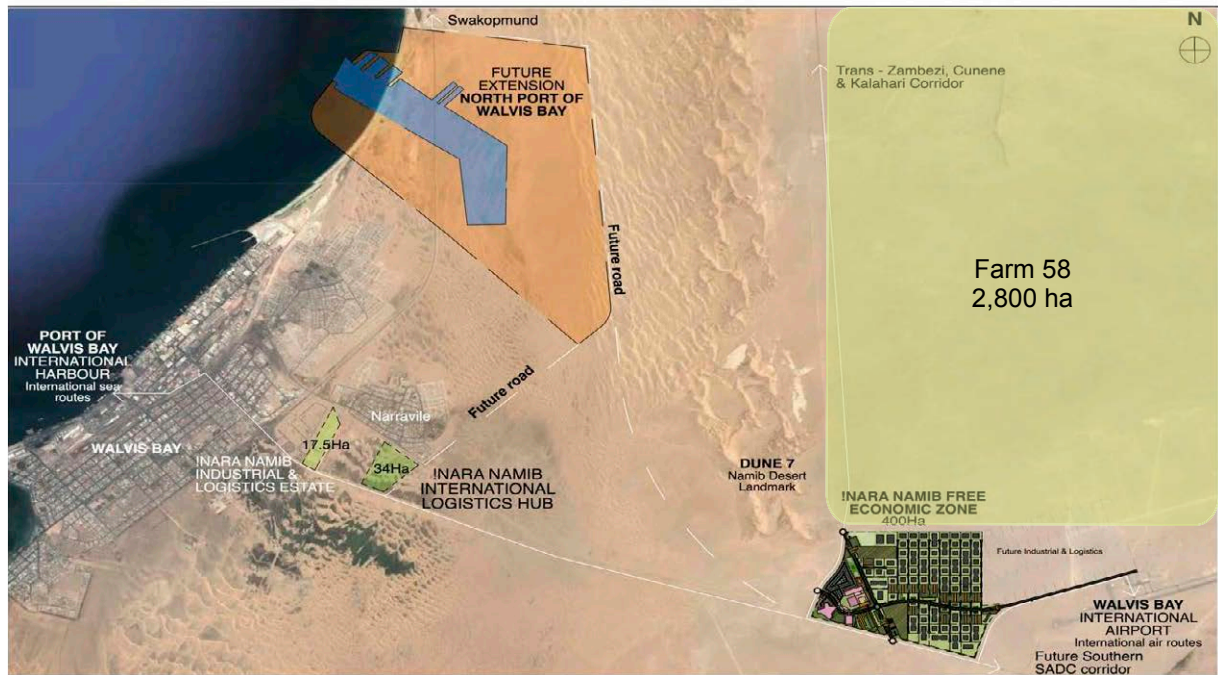
Category	Number of companies	Plot size (ha)
Crude oil refinery, oil terminal	4	1,200
Industrial estate	2	1,250
Logistics and warehouse	5	490
Cement factory	3	80
Others	2	80
Total	17	3,100

Source: Walvis Bay Municipality

A crude oil refinery and oil terminal on a large plot would not be economically viable to locate here in Walvis Bay. Although a new oil jetty is under construction, Walvis Bay is not located near either a large oilfield or consumption area. In addition, the cost of water supply is too high. A cement factory might not be viable either. There is a new and competitive cement factory that has recently started to operate in Namibia. That factory has sufficient capacity to supply the total Namibian demand competitively. The facilitator for the development should have a good professional sense to evaluate expressed interests and business plans from the feasibility perspective. It is important to avoid the situation where precious allocated land is not used productively.

A detailed layout planning was discussed with stakeholders in September, however, coordination was found to be difficult among stakeholders.





Source: NDC and JICA Study Team

**Figure 5.6: Location of Farm 58 and development sites of NDC**

### 5.3.2.2 Industrial estate development projects

The National Development Corporation (NDC) has three industrial estate development projects in Walvis Bay. Two estates (17.5 ha and 34 ha) are located in the planned light industry area adjacent to the existing industrial area, while the Free Economic Zone (400 ha) is located behind Dune 7. The Free Economic Zone is at the initial stage of conceptual design and it could be included in the development of Farm 58 mentioned above. NDC and Walvis Bay Municipality agreed to prepare 400 ha of the land inside Farm 58 but the exact location has not been agreed yet.

The first phase of NARA Namib Industrial & Logistics Estate (7.5 ha out of a 17.5 ha) has already been started. The first phase area is going to be provided to small and medium scale Namibian logistics companies, according to NDC. NDC is calling private companies to develop 10 ha of the 17.5 ha land. Regarding 34ha of land, NDC has already completed detailed design to develop logistics facility; however, schedule for construction of the facility has not been set yet.

### 5.3.3 Transportation master plan

This Transportation Master Plan for Walvis Bay was formulated after IUSDF. However, a transport network different from the one in IUSDF was proposed in the plan. The road hierarchy and alignment was different from the IUSDF as shown in Figure 5.7. Accordingly, the land-use plan might be required to change. For example, one access road from the new port to Near Dune 7 was proposed and additional class 2 roads are also proposed just south of the class 1 road. These were not planned in the IUSDF illustrated on the right.



Note: Circled lines indicate difference of road hierarchy and alignment between IUSDF and Transport Master Plan  
 Source: IUSDF and presentation material of Transport Master Plan

**Figure 5.7: Comparison of proposed Transportation Master Plan and IUSDF**

### 5.3.4 Port development and town development

Namport has a phased development plan for Walvis Bay Port including a new container terminal and North Port. The town planning is synchronized with the port development plans. More attention should however be paid to environmental issues, for instance, increase of truck and trailer traffic around the port might have an effect on the residential area of Walvis Bay which is located adjacent to the main access road of the port. It is necessary to take environmental issues such as safety, noise, and vibration into account and mitigating measures should be prepared.



Source: Open Street Map and JICA Study Team

**Figure 5.8: Port access road and land use**

## 5.4 Profiles of border towns

### 5.4.1 Katima Mulilo

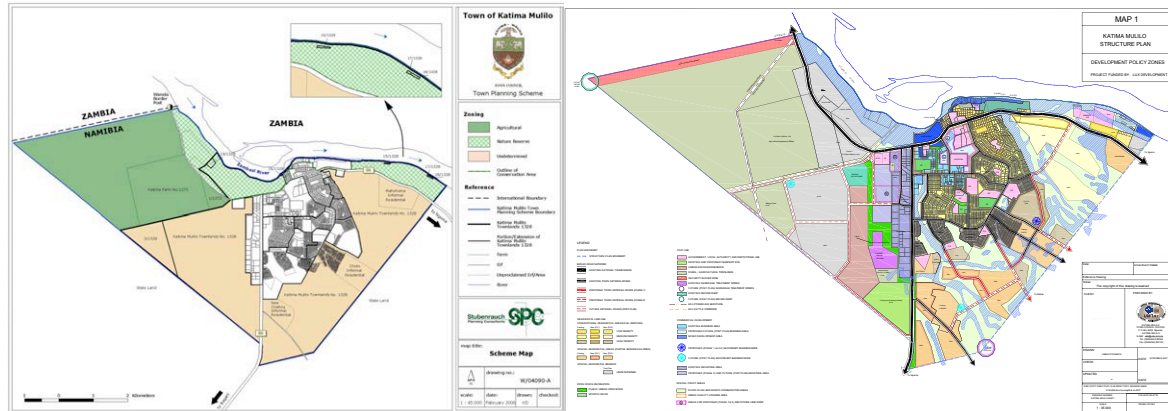
#### 5.4.1.1 Town planning scheme

Katima Mulilo is the capital of Zambezi Region and located at the end of the Caprivi Strip. The town faces both the Zambian border to the northwest and the Botswana Border 20 km to the southeast. The north of the town faces the Zambezi River, which flows into Indian Ocean through Zambia, Zimbabwe and Mozambique.

The town has two “T shape” trunk roads that make up the framework. These are the road from Rundu at the junction with the road connecting Wanela border and Ngoma border. Wanela Border is located at the north edge of the town facing Zambia, while Ngoma border to Botswana is about 20 km southeast of the town.

To the east of the junction, there is a business and commercial area. The residential area is located further away from the trunk roads. To the west of the trunk road is a light industrial area.

The town planning scheme was proclaimed in 2006 and structure plan<sup>1</sup> was also formulated in 2007. The scheme maps are shown in Figure 5.9. However, the plan has not been updated since then, which is the case with many other local authorities as well.



Source: Katima Mulilo Municipality

**Figure 5.9: Town planning scheme and structure plan of Katima Mulilo**

In the plan, it is clear that the housing development is expanding towards the southeast. The west side of the town is proposed as an agricultural area. Some industrial development is proposed just behind the light industrial area. However, the plan does not mention a bypass road, logistics area and border facility expansion area that will be needed to accommodate increased cargo flows through the

<sup>1</sup> Town Planning Scheme has a legal restriction for approved land use plan. Local authorities shall prepare the plan every 5-year. While, Structure Plan does not have legal restriction. Prepared for securing orderly, coordinated, efficient and environmentally sound urban development and proper use of land. Local authority shall prepare this type of plan after the Urban and Regional Planning Bill was enacted.

town and to the border.

### 5.4.1.2 Population projection

The Population Projection of Katima Mulilo is shown in the following table. This projection was based on the NSA population projection<sup>2</sup>. The Regional Population was projected, however town level projection was not available. The study team made a projection by extrapolating the urban population ratio of the region and assumed the distribution pattern of the respective towns in the region. This projection did not take into account either geographical condition or industrial status.

**Table 5.6: Projection of urban population (Katima Mulilo)**

	Items	2011	2015	2020	2025
Zambezi Region	Population	90,756	97,176	105,706	114,367
	Urban Ratio (%)	31	36	42	46
Katima Mulilo	Population	28,211	34,983	43,868	52,609

Source: Population projection by NSA (Population estimation of Zambezi Region); JICA Study Team (Population projection of Katima Mulilo)

## 5.4.2 Oshikango (Helao Nafidi)

### 5.4.2.1 Town layout and history

Helao Nafidi is relatively new town, which was proclaimed in 2004 and started operation from 2005. Oshikango, located on the Angolan border along B1 road is one of the major urban areas in Helao Nafidi town with a population of approximately 19,000 people in 2011. Oshikango developed rapidly after 2002 when the civil war in Angola ended. Due to the increase in the volume of cross border cargo, many warehouses were built along B1 road. In addition, a new railway line with a station was opened in 2012. In 2013, the Angolan Government refurbished and started operation of the Border facilities, which was considerably larger than the Namibian border facilities.

The town development had been conducted focusing mainly on the area along the road without proper control being exercised. As a result, there is no space has been reserved for the border facilities to expand. The reason for this is that no town planning was formulated and no spatial development control was done in the town. It is also because the town council was only established in 2004 and had no time to prepare itself for such fast paced growth in the Oshikango area. Consequently, there is no available land to expand the border facility area now to alleviate traffic congestion as well as expansion of the necessary facilities.

### 5.4.2.2 Town planning scheme

Both the town planning scheme and structure plan were not prepared for Helao Nafidi town. In 2010, a “Spatial development framework for Helao Nafidi” was drafted. However it was not finalized. In

---

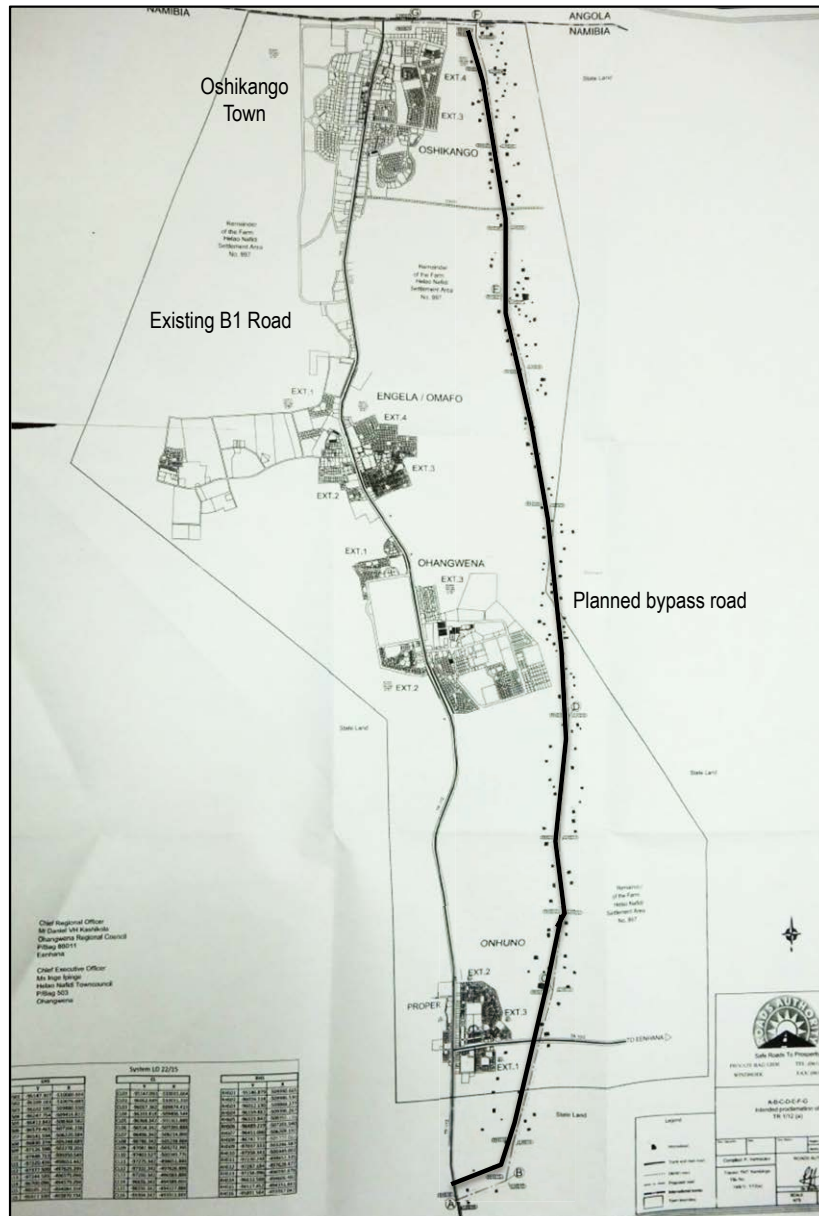
<sup>2</sup> [http://www.nsa.org.na/files/downloads/9e7\\_Population%20Projections%20Report\\_%2015%20Sept%202014\\_FINAL.pdf](http://www.nsa.org.na/files/downloads/9e7_Population%20Projections%20Report_%2015%20Sept%202014_FINAL.pdf) retrieved on October 2014.



this draft, two-bypass roads were proposed. The first one was to be to the east of town and the second one was planned to be between the built-up area and the railway station to the west of the town. A new urban structure was also proposed in association with the bypass road development.

### 5.4.2.3 Bypass road plan

The Roads Authority planned a bypass and started the design in 2014. When the budget is approved, they plan to start construction from 2015.



Source: Roads Authority

**Figure 5.10: Alignment of B1 bypass in Helao Nafidi**

This plan makes provision for about a 20 km long bypass with direct connection to the border facilities from the south end of Helao Nafidi Town. The alignment is as shown in Figure 5.10.

Once this bypass is completed, a new town planning concept will be introduced, since traffic flows of people and cargo will be changed completely. In order to reserve potential areas for the next step of development such as public space and common facilities, the town council should formulate and enforce the town planning scheme and structure plan.

The town currently does not have the capacity to conduct such town planning. For example, the town council is not able to hire a registered residential town planner, and thus consultants are hired from private companies. In addition, the town does not have sufficient financial capacity to conduct land development by themselves according to the CEO of the town.

#### 5.4.2.4 Population projection

The population projection of Helao Nafidi is shown in Table 5.7. This projection is based on the NSA population projection<sup>3</sup>. The Regional Population was projected, however town level projection was not available. Thus a projection was made by extrapolating the urban rate of the region and distribution to towns. This projection did not take into account either geographical condition or industrial status.

**Table 5.7: Projection of urban population (Helao Nafidi)**

	Items	2011	2015	2020	2025
Ohangwena Region	Population	246,451	253,348	265,234	278,281
	Urban ratio (%)	10	14	19	24
Helao Nafidi	Population	19,094	27,833	39,485	52,061

Source: Population projection by NSA (Population estimation of Ohangwena Region); JICA Study Team (Population projection of Helao Nafidi)

### 5.5 Urban infrastructure to support logistics sector

This section is to assess possible constraints of the key utilities for implementing the logistics hub master plan through reviewing of the current situation. Key utilities are water and electricity. In general, logistic facilities do not require a huge volume of water and power. Thus the project focuses on confirming whether the responsible organization is capable of stable supply for an average business with reasonable requirements rather than in cases of serving energy or water intensive industries such as uranium mining. In addition, if the operations of utilities have relation with stakeholders for the implementation of the Logistics Master Plan, the issues are examined.

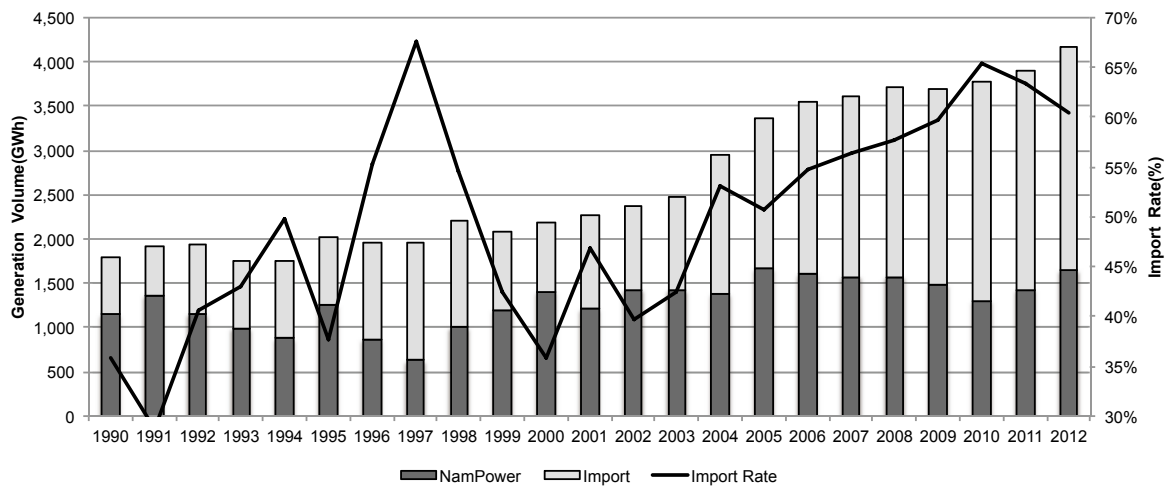
#### 5.5.1 Power supply

Figure 5.11 summarizes the trend in Namibia's power generation by source and import ratio. The average growth rate was 5.6% after 2011. The growth of power generation after 2001 has been attributed to the increase in import. Consequently, the share of imported power has reached around

<sup>3</sup> [http://www.nsa.org.na/files/downloads/9e7\\_Population%20Projections%20Report\\_%2015%20Sept%202014\\_FINAL.pdf](http://www.nsa.org.na/files/downloads/9e7_Population%20Projections%20Report_%2015%20Sept%202014_FINAL.pdf) retrieved on October 2014.



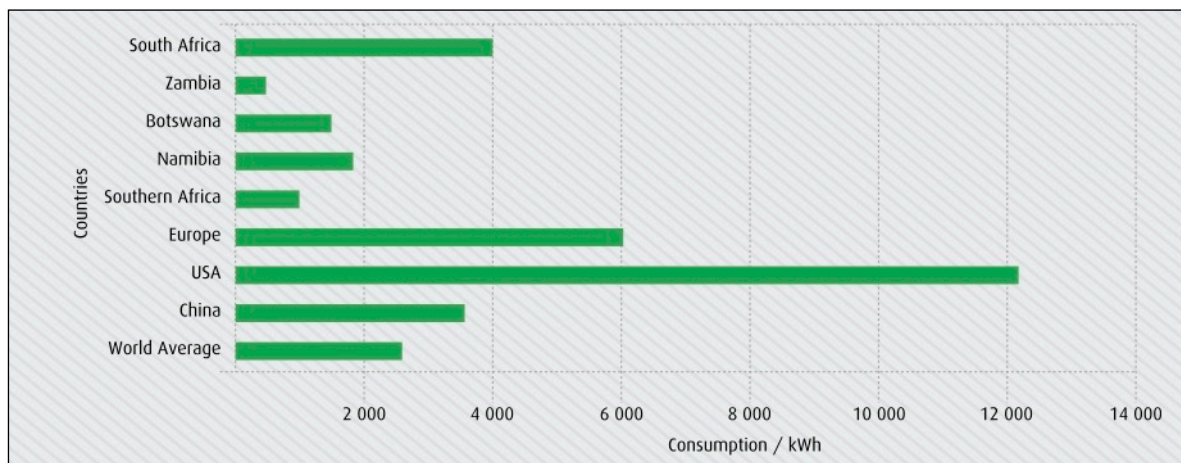
60 to 65% in recent years.



Source: ECB (Electricity Control Board)

**Figure 5.11: Power generation volume in Namibia (GWh) and its import rate**

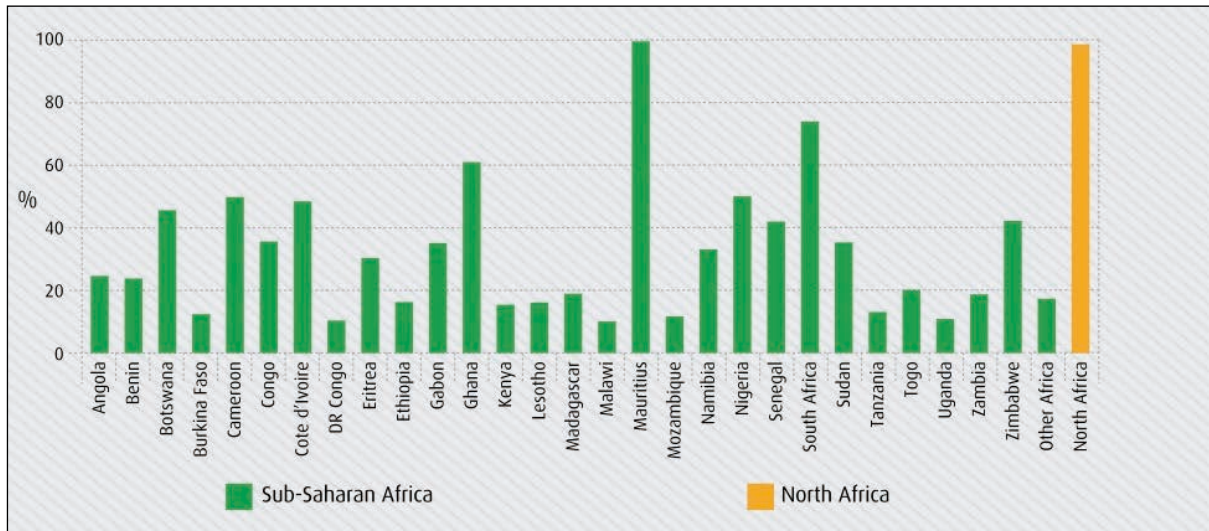
The per capita power consumption in Namibia is below 2,000kWh as shown in Figure 5.12. This is higher than the regional average of Southern Africa<sup>4</sup>, however almost half the level of South Africa. The consumption is expected to increase in line with the economic growth. The electrification rate is less than 40% (Figure 5.13). This rate needs to double to achieve the target in Vision 2030. Consequently, electricity consumption is projected to increase more.



Source: ECB (Electricity Control Board)

**Figure 5.12: Power consumption per person in Namibia**

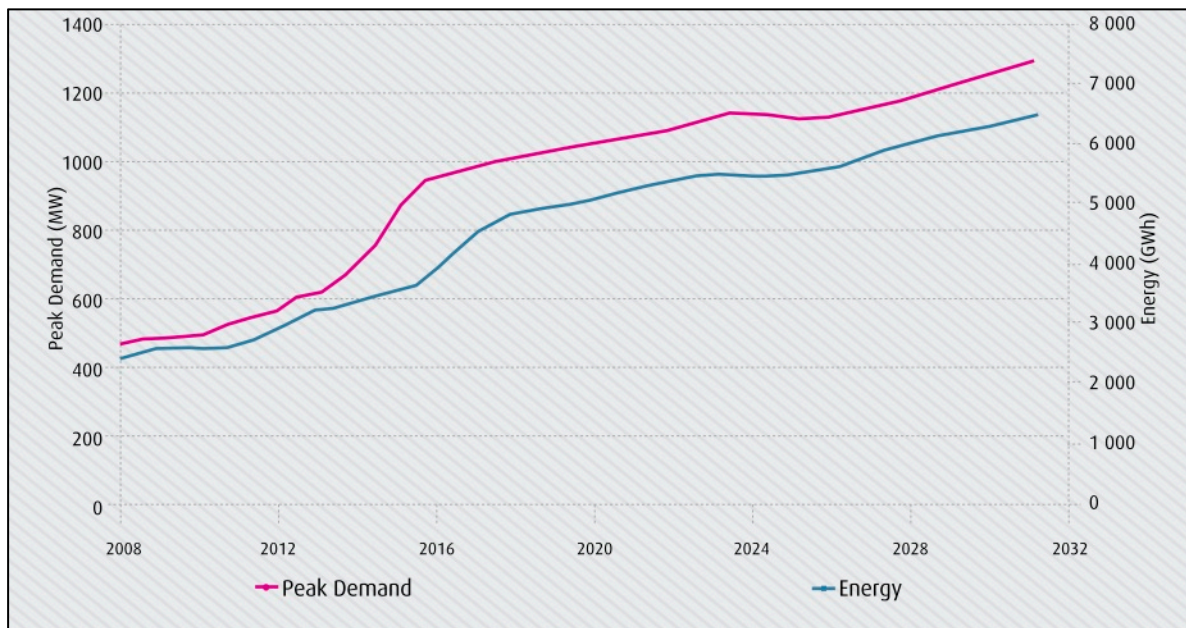
<sup>4</sup> According to Annual Report of NamPower



Source: ECB

**Figure 5.13: Electrification ratio in Africa**

The future demand for both consumption and peak power is summarized in Figure 5.14. Both consumption and peak power is projected to almost double from 2008 to 2025.

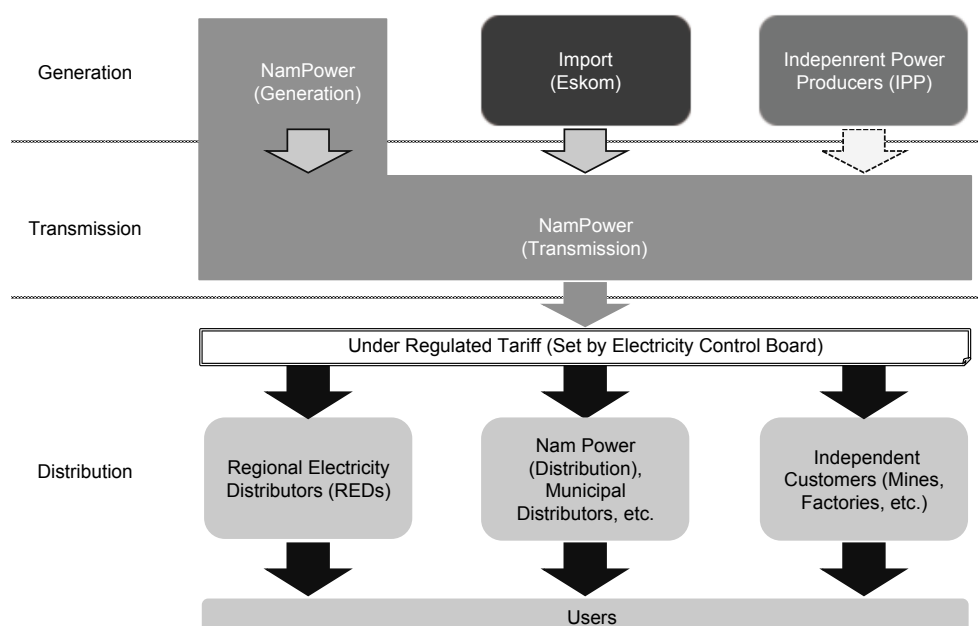


Source: ECB Annual Report

**Figure 5.14: Demand forecast**

### 5.5.1.1 Organizations responsible for power supply

As a result of power sector reform, three stages of power supply: generation, transmission and distribution, were separated in line with the current trend in the world. Previously, NamPower was the sole organization playing a role in all three stages. Recently, an IPP (Independent Power Producer) scheme was introduced for power generation while regional distribution companies were established for distribution. NamPower, however, remains as the largest generator of electricity.



Source: JICA Study Team

**Figure 5.15: Stakeholders in power supply**

### 5.5.1.2 Power generation and import

Currently four power plants of NamPower are operational, however both coal and diesel plants seem to be inactive as shown in Table 5.8. The local generation volume accounts for only 38% while 62 % was imported from SADC countries based on agreements. The import ratio has been gradually increasing in recent years.

**Table 5.8: Generation and import for local supply (2012/13)**

Source	Generation (MWh)	Capacity (MW)	Share in total supply	Remarks
<b>Local Power Stations</b>				
Ruacana	1,236,597	330.0	35%	Hydro
Van Eck	84,110	120.0	2%	Coal
Paratus	20	24.0	0%	Diesel
Anixas	8,270	22.5	0%	Diesel
<b>Total local generation</b>	<b>1,328,997</b>	<b>507.5</b>	<b>38%</b>	
<b>Imports</b>				
Eskom (South Africa)	649,037	-	19%	Supplementary power supply agreement (Year), Bilateral power supply agreement (15 Years from 2006)
Zesco (Zambia)	433,501	-	12%	Power supply agreement (10 Years from 2009)
ZESA (Zimbabwe)	1 049,669	-	30%	Power supply agreement (5 Years from 2008)
Aggreko (Mozambique)	45,600	-	1%	Power supply agreement from 2012
<b>Total imports</b>	<b>2,177,807</b>		<b>62%</b>	

Source: ECB

IPPs have not started operation, though licenses were given as shown in Table 5.9, although the license was given. This is the one of the critical factor that rate of import electricity power increase. .

**Table 5.9: Licenses given to IPPs**

Licensee	Type	Capacity (MW)	Issued date	Validity period (Year)	Remarks
CBEND (Bush Energy Namibia)	Biomass	0.250	1-May-10	5	Commercial operation to start
GreeNam Electricity (Pty) Ltd	Solar	30	1 June-11	25	
Diaz Wind Power (Pty) Ltd	Wind	44	1-Apr-07	22	
Vizion Energy Resources (Pty) Ltd	Coal (CFB)	300	4-Apr-08	25	Progress Report due
Atlantic Coast Energy Company (Pty)	Coal (pulverised)	700	1-Nov-07	25	
Ark Industries Namibia (Pty) Ltd	Biogas	16	1 Jan-13	25	
Namibia International Mining Company (NIMC)	Diesel CCGT	210 (68)	1-Jun-07	20	License expired and not renewed
Electrawinds (Pty) Ltd	Wind	50	1-Nov-09	20	
InnoWind (Pty) Ltd	Wind	60	1-Mar-10	20	

Source: ECB

The planned development in the generation sub-sector is summarized in Table 5.10. The maximum peak demand in 2025 is expected to be below 1,200MW as shown in Figure 5.14. If the development is on schedule, domestic plants will supply most of the electricity and the import volume might be minimized.

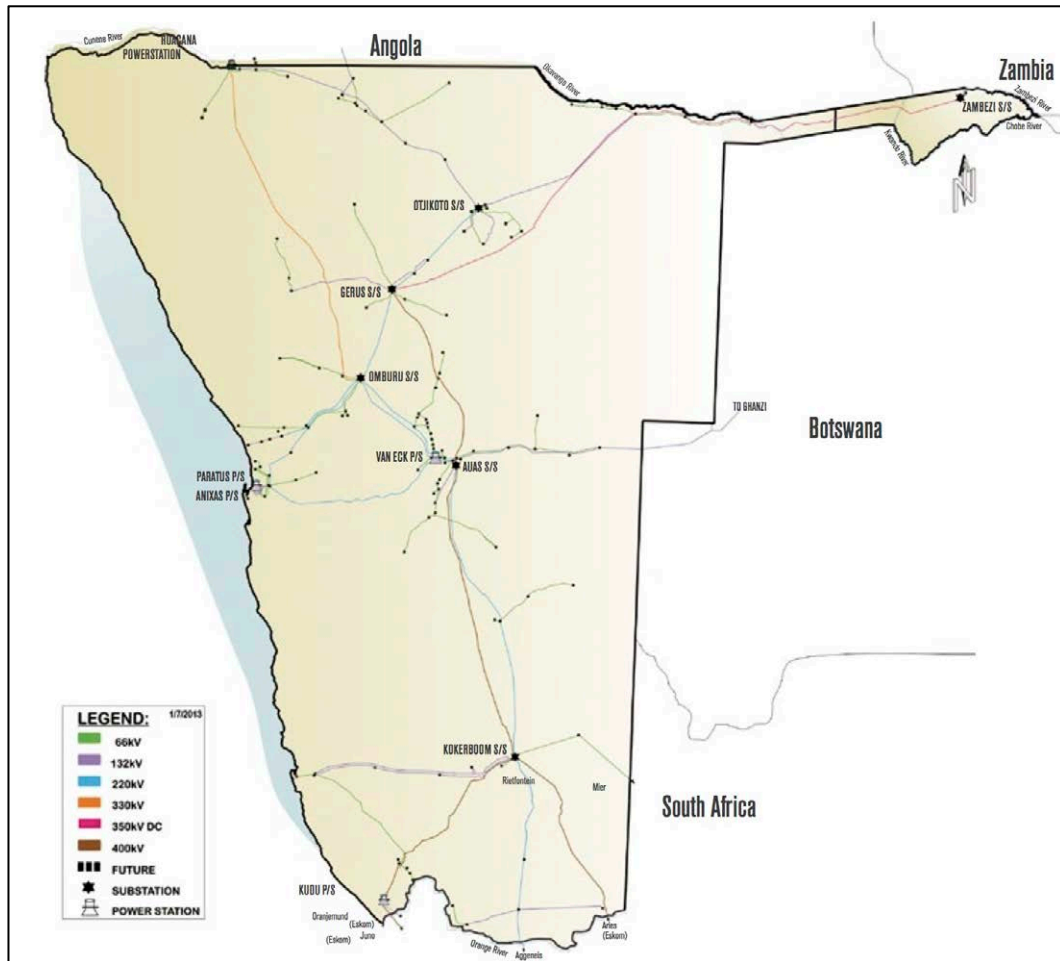
**Table 5.10: Construction and rehabilitation plan of power plants**

Name	Capacity	Type	Target Year	Remarks
Erongo Coal Power Station	300MW	Coal fired	–	This project has been shelved, following Government's decision to prioritize the Kudu Gas-to-Power project
Kudu Gas Power	800MW	Combine cycle thermal	2018	Base load
Baynes Hydro Power	600MW	Hydro power	2020/2021	Joint project with Angola. Estimated project cost is USD1.3 billion. 50% of the total power generation capacity is allocated to Namibia.

Source: Annual Report 2013, NamPower

### 5.5.1.3 Transmission

Nampower is the sole transmitter in Namibia. The domestic transmission network is shown in Figure 5.16. New transmission lines and increase in the capacity of the existing lines is also planned according to the generation volume and demand increase.



Source: NamPower Annual Report

Figure 5.16: Transmission network in Namibia

### 5.5.1.4 Distribution

NamPower supplies bulk electricity to mainly Regional Electricity Distributors (REDs), and to Local Authorities, farms and mines. Out of 5 planned REDs, three are currently in operation as distributors as shown in Table 5.11. The municipalities or NamPower supply electricity to the rest of the areas.

Table 5.11: Regional Electricity Distributors (REDs)

Name of the company	Representative municipality and town	Remarks
The Northern Regional Electricity Distributor (NORED)	Oshakati, Oshikango, Rundu, Katima Mulilo,	
The Central North Regional Electricity Distributor (CENORED)	Tsumeb, Grootfontein, Otavi, Otjiwarongo, Okahandja	
Erongo RED	Swakopmund, Walvis Bay, Henties Bay, Usakos, Karibib	
Central Regional Electricity Distributor	Windhoek, Gobabis	Planned, Not Operating
Southern Regional Electricity Distributor	Rehoboth, Keetmanshoop, Lüderitz	Planned, Not operating

Source: JICA Study Team



## 5.5.2 Urban water supply

### 5.5.2.1 Climate and conditions

The climate in Namibia is arid or semi-arid and this results in a very low humidity though it varies considerably between different regions. The precipitation increases from the southwest to the northeast from 0 mm to 600 mm annually. Major rivers, such as the Kunene, Orange, Zambezi and Okavango River, run along the borders. Since these perennial rivers are located far away from the urban consumption centres, groundwater is extensively used as water sources in addition to surface water conveyed over a long distance. In some towns, treated wastewater is recycled as well. The first reverse osmosis desalination plant in Sub-Saharan Africa started operation from 2010 for the mining industry. The cost for water is high in Namibia.

### 5.5.2.2 Access to water

As shown in Table 5.12, the government has done much to provide access to safe drinking water. In the urban areas, the ratio of access to safe water reaches 97%, while that of the rural areas is 62%.

**Table 5.12: Water sources and rate of access to safe drinking water**

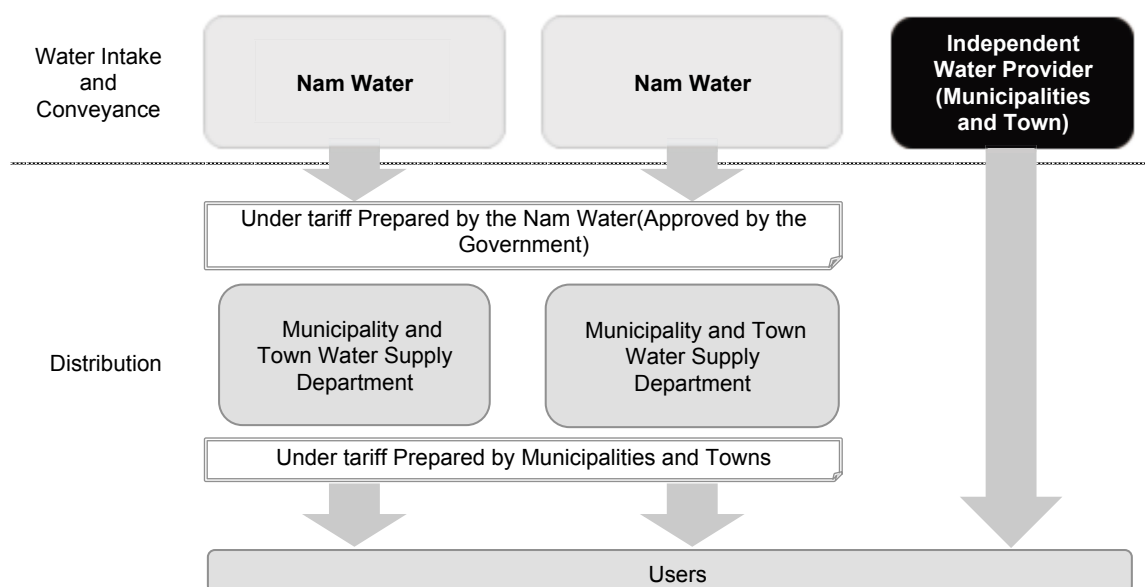
Area	Household	Piped Water Inside (%)	Piped Water Outside (%)	Public Pipe (%)	Borehole with Tank Covered (%)	Well-Protected Borehole (%)	Safe Water Total (%)	River dam Stream (%)	Others (%)
Urban	235,884	46.6	24.5	26.1	0.3	0.2	97.7	0.5	1.8
Rural	228,955	14.1	15.1	17	13.1	3.5	62.8	15.9	21.3
Total	464,839	30.1	19.7	21.5	6.8	1.9	80.0	8.3	11.6

Source: Population and Housing Census 2011

### 5.5.2.3 Organisations responsible for urban water supply

The Ministry of Agriculture, Water and Forestry (MAWF) is responsible for urban water supply. The Namibian government commercialized bulk water supply after independence. NamWater (Namibia Water Corporation), a parastatal owned by MAWF, was established 1998 and became the organization responsible to develop water supply schemes and sell bulk water to municipalities and towns. Some municipalities, however, have their own water supply schemes. The structure of urban water supply is summarized in Figure 5.17.





Source: JICA Study Team

**Figure 5.17: Organisations responsible for urban water supply**

#### 5.5.2.4 Coastal Area

This study paid particular attention to Walvis Bay in the coastal area, since the most important logistic hub centre proposed in the Logistics Master Plan will be situated here. Availability of water is one of the critical factors although the consumption volume is not large in the Logistics Hub.

Bulk water is provided to Walvis Bay Municipality by Nam Water who distributes it in the city. The distribution record for the past five years is shown in Table 5.13.

**Table 5.13: Water distribution in Walvis Bay in past 5 Years**

Category		2009	2010	2011	2012	2013
Fish industry	Consumption (m3)	772,761	952,347	754,216	905,124	959,133
	Ratio	15%	18%	14%	16%	16%
Port	Consumption (m3)	222,768	148,905	144,308	158,552	309,602
	Ratio	4%	3%	3%	3%	5%
Other town area	Consumption (m3)	4,127,753	4,293,897	4,375,725	4,610,982	4,745,990
	Ratio	81%	80%	83%	81%	79%
Total	Consumption (m3)	5,123,282	5,395,149	5,274,249	5,674,658	6,014,725
	Growth Rate	-	5%	-2%	8%	6%

Source: Walvis Bay Municipality

The ratio of technical loss during the water distribution is about 10%. This was achieved because water is distributed at low water hydraulic pressure by gravity, and lines are frequently maintained.

#### 5.5.2.5 Water resource development

Nam Water prepared a water resource development plan based on the population projection by Walvis Bay municipality. In a good rainy season, the current water source, the Kuiseb aquifer can supply 12

million m<sup>3</sup> per year, which is almost double the consumption of Walvis Bay. However, the sustainable yield is said to 7 million m<sup>3</sup>, although they have plans to expand the capacity to 13 million m<sup>3</sup> per year. There is another option to explore new water resource. It is reported that GRN is negotiating with Areva to purchase a desalination plant. This desalination plant with a capacity of 20 million m<sup>3</sup> per year started operation in 2010 to provide water to a uranium mines but the operation rate was not high due to limited demand. The plant can supply water to 130,000 inhabitants in Walvis Bay and Swakopmund if the capacity is fully used for domestic use and economic activity in the both municipalities<sup>5</sup>. However, the average production cost of the desalination plant is higher than the present water price, which remains a challenge.



Figure 5.18: Water scheme in coastal area

### 5.5.3 Issues on electricity and water

#### 5.5.3.1 Roles of local authorities

As discussed in the previous section, some local authorities play a role in power distribution and water distribution. Income from these services supplements the budget for the operation of local authorities. However, the collection ratio from the clients is limited due to the financial status of clients and

<sup>5</sup> Daily water consumption amount for domestic use and industrial use is assumed 450 litres in this calculation.

collection capabilities of Local Authorities. These have influenced the financial situation of the authorities as well. This may affect the performance of local authorities that need to play some role in the development of logistics related infrastructure. These issues will be studied further in the second stage of the study.

### **5.5.3.2 Access to remote areas**

As described in the chapter three, Namibia covers a vast land area with a limited population. On the other hand, access to electricity must be improved. Given this low population density, however, it is important to assess development cost and the most cost effective way to achieve this. It is more likely that introducing independent systems is more viable in the remote areas.

### **5.5.3.3 Monitoring implementation of plans**

As described, one of the objectives of the review of supporting infrastructure is to assure capacity for providing infrastructure services to the logistics sector. Currently, both water and electricity sectors have enough capacity to do so. However both sectors face some structural problems that cannot be solved in the short term. Generally, the scarcity of water might increase the cost of water and make it more difficult to develop water resources in case of the water sector, while high growth in consumption of electricity requires rapid facility development. In addition, it is observed that the low population density makes the supply of water and electricity more difficult and costly. These conditions result in delays and difficulties in implementation of current plans. These matters will be studied in more detail in the second phase of this project. In any case, monitoring will be required for both sectors at the implementation stage of the Logistic Hub Master Plan

## 6. Transport Infrastructure in Namibia and SADC

---

### 6.1 Review of the existing studies and plans on regional transport infrastructure

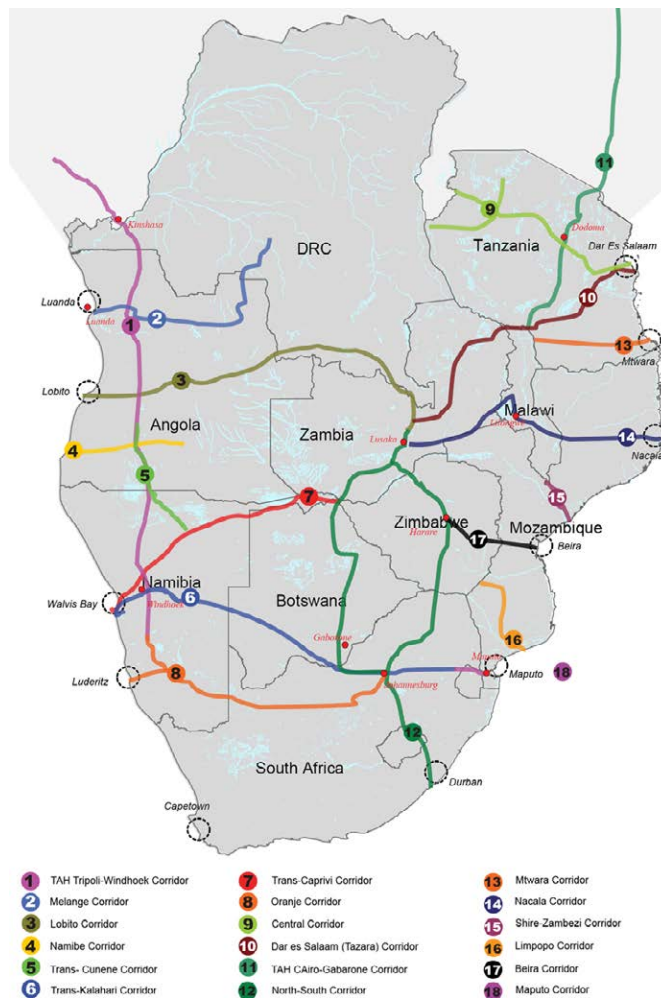
#### 6.1.1 Preparatory Survey for the Southern Africa Integrated Regional Transport Program

JICA conducted a study titled “Preparatory Survey for the Southern Africa Integrated Regional Transport Program” in 2010. A major focus of the study was to analyse the development potential of 18 economic corridors, select priority corridors and to prepare support programs by the Japanese Government to develop regional transport infrastructure in southern Africa.

Figure 6.1 shows the 18 economic corridors. These economic corridors were evaluated from the following points.

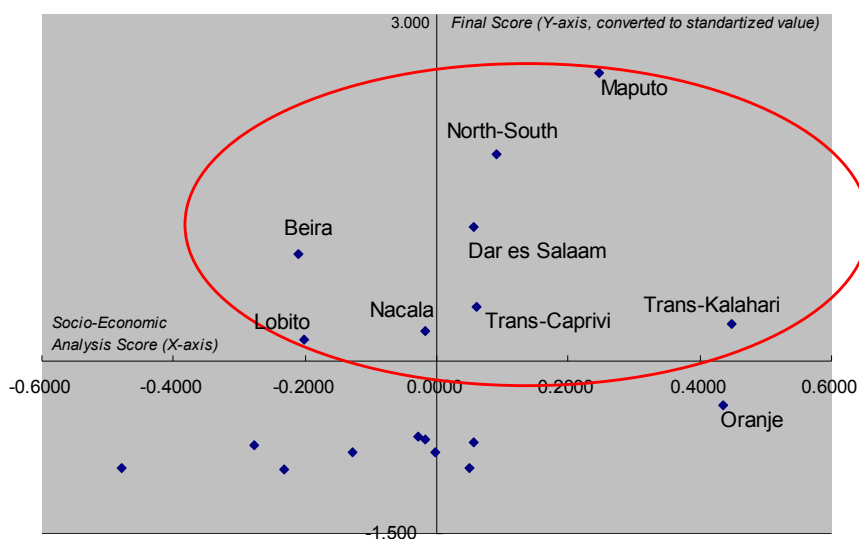
- Contribution to regional economic development scenarios,
- Cost effectiveness: expected benefit (increase in traffic volume and reduction of transport cost) from transport infrastructure projects against development cost of the transport infrastructure projects, and
- Socio-economic conditions of each corridor: population, economic development, governance and business environment.

Figure 6.2 shows the result of the evaluation. The X-axis of the diagram indicates socio-economic conditions and Y-axis indicates contribution to the regional economic development scenarios and cost effectiveness. Eight corridors in a red circle in Figure 6.2 were selected as the prioritized economic corridors and those corridors are listed in Table 6.1. The Walvis Bay–Ndola–Lubumbashi Development Corridor (WNLDC) and Trans–Kalahari Corridor ended in the 6<sup>th</sup> and 7<sup>th</sup> position in Table 6.1.



Source: Final Report of Preparatory Survey for Southern Africa Integrated Regional Transport Program, JICA, 2010

**Figure 6.1: 18 Economic corridors**



Source: Final Report of Preparatory Survey for Southern Africa Integrated Regional Transport Program, JICA, 2010

**Figure 6.2: Analysis of the selected corridors**

**Table 6.1: Results of corridor evaluation**

Rank	Corridors
1	Maputo Corridor
2	North-South Corridor
3	Dar es Salaam Corridor
4	Beira Corridor
5	Nacala Corridor
6	Walvis Bay–Ndola–Lubumbashi Development Corridor (WNLDC)
7	<b>Trans–Kalahari Corridor</b>
8	Lobito Corridor

Source: Final Report of Preparatory Survey for Southern Africa Integrated Regional Transport Program, JICA, 2010

After prioritizing 8 economic corridors, the study team proposed propriety sectors and directions of future development in both short-term (until 2012) and long-term (until 2020) as shown in Table 6.2.

**Table 6.2: Development directions for selected priority corridors**

Corridor name	Priority sectors	Short-term (until 2012)	Long-term (until 2020)
Maputo Corridor	Border post and port	Approaches to reducing the border crossing time	The physical development of the Port of Maputo and/or an alternative port in the vicinity of Maputo as well as an improvement in port operation systems
North-South Corridor	Bridge (roads), border posts, and railway	Bridge construction and OSBP development along the road corridor Implementation of measures to improve railway operations	Improvements of railway capacity through both hard and soft infrastructure measures
Dar es Salaam Corridor	Port, railway, and border post	Rolling stock to improve railway service, streamlined port procedures, and rehabilitation of deteriorated road sections	Increase railway capacity to facilitate a shift of heavy minerals from road to rail.
Beira Corridor	Railway and port	Dredging at the Port of Beira Rehabilitation of the Sena Railway Line with FS of unpaved road sections traversing major production areas, followed by basic and detailed design studies	Reduce railway and road transport time and costs including the implementation of OSBP
Nacala Corridor	Railway, port, and road	Rehabilitate roads and undertake feasibility studies for railway track rehabilitation	Rehabilitate of corridor railway and improve the port. Border post improvements should follow road improvements and the development of traffic.
<b>Walvis Bay Ndola Lubumbashi Development Corridor (WNLDC)</b>	<b>Port and railway</b>	<b>Container terminal development at the Port of Walvis Bay</b>	<b>Construction of a proposed railway</b>
<b>Trans-Kalahari Corridor</b>	<b>Port and railway</b>	<b>Undertake the first phase of construction of the container terminal at the port of Walvis Bay after the completion of the on-going feasibility study</b>	<b>Extend the railway along the corridor Develop a new coal terminal at the port for the export of coal from Botswana</b>
Lobito Corridor	Port and railway	Short-term projects are considered difficult for the Lobito Corridor due to a lack of institutional readiness.	Lobito Corridor is essential as an outlet for the Zambian mining sector, and there are substantial potential benefits from rehabilitating the North-East Zambian Route.

Source: Final Report of Preparatory Survey for Southern Africa Integrated Regional Transport Program, JICA, 2010

The study team also compiled situation of major development projects for the WNLDC and Trans–Kalahari Corridor as of May 2010 as described in the next sections. Sentences in parentheses are updates as of January 2015.



#### **6.1.1.1 WNLDC**

**Development of a new container terminal at the Port of Walvis Bay:** This project will contribute to enhance capacity of the WNLDC. (Construction work of this project has started on 9<sup>th</sup> May 2014.)

**The Trans-Caprivi Railway Project (Cape Fria/Angra Fria–Katima Mulilo, Grootfontein – Katima Mulilo):** This project will connect Walvis Bay and western Zambia via Tsumeb, Grootfontein, and Katima Mulilo. SADC region has no direct railway link to the west coast. In particular, the private sector of the Copperbelt is looking for a rail-based import/export route via Walvis Bay to optimize its supply chain and global competitiveness. The branch section to Cape Fria/Angra Fria is also included in the project scope. The project cost of a section from Tsumeb to Katima Mulilo is estimated at 0.53 billion US dollar.

**Rehabilitation of Walvis Bay–Tsumeb railway (400 km) (Namibia):** The terms of reference of the project has already been announced and TransNamib has received Expressions of Interest (EOIs) when the study was conducted. (According to TransNamib, the upgrading of the section between Kranzberg and Tsumeb is being conducted as of January 2015.)

**Development of Wenela/Katima Mulilo (Sesheke) OSBP Project (Namibia/Zambia, long-term project):** Wenela/Katima Mulilo (Sesheke) is one of the most lightly trafficked borders, with traffic of 20–25 trucks per day as of 2008–09. The time required for the customs procedure at the border was estimated about 1–3 days at that time. (The Customs and Excise Department of Namibia and the Zambia Revenue Service have started talks to develop an OSBP but the implementation of the project has not been decided as of January 2015.)

#### **6.1.1.2 Trans–Kalahari Corridor**

**Development of a New Container Terminal at Walvis Bay Port:** JICA completed a feasibility study for the development of a new container terminal in March 2010. This study calls for expansion of the terminal in three phases. The construction cost for Phase 1 was estimated at N\$ 1,594 million and that for yard expansion in Phase 2 at N\$ 50 million (excluding equipment procurement). (As mentioned above, this project started on 9<sup>th</sup> May 2014 with financial support of ADB.)

**Trans–Kalahari Railway Project:** This project aims to connect Walvis Bay Port and Lobatse in Botswana over a distance of about 1,380 kilometres to transport coal is to be mined at Mmamabula<sup>1</sup>. The total project cost is estimated to be about 1.4 billion US dollars.

**Development of a New Coal Terminal at Walvis Bay Port (Namibia, long-term project):** In line with development of the Trans-Kalahari Railway, development of bulk terminal to handle coal is essential.

---

<sup>1</sup> Refer to section 3.2.4 of Appendix in detail

**Assistance for Implementation of the Trans–Kalahari/Mamuno One Stop Border Post (OSBP) Project: (e.g., ICT, Legal, Procedures, Training, Border Community Integrated Development)**

**(Namibia/Botswana, short-term project):** A USAID–assisted feasibility study done in 2008 found that the border post at Buitepos/Mamuno can be converted to an OSBP operation with relatively minor adjustments compared to other border crossings although some infrastructure/facilities improvements will be required. After the feasibility study, JICA supported the project.

**Project for the Establishment of an (OSBP) between Botswana and Namibia at Mamuno/Buitepos Border Post:** JICA supported Namibia’s Customs and Excise Department of the Ministry of Finance, and Botswana Unified Revenue Service for enhancement of the capacity to operate an OSBP in the future. (The project was conducted from October 2010 to October 2013, and the following outputs were delivered through the project: operational model of an OSBP, practical knowledge to operate the OSBP and enhancement of capacity to conduct operational and technical customs procedures.)

### 6.1.2 SADC Regional Infrastructure Development Master Plan

The “Regional Infrastructure Development Master Plan Transport Sector Plan (TSP)” was published in August 2012 by SADC. The TSP analysed the current situation regarding transport infrastructure, needs for infrastructure in 2027, and the legal, regulatory and policy environment that regulates transport operations. The following sections describe the current situation regarding transport infrastructure in SADC member states.

#### 6.1.2.1 Roads

The road sector is the major surface transport activity in the SADC region, and includes both passenger and freight transport. Road transport costs are competitive with rail for most general cargo, and the quality of service is generally good.

#### **Road network**

The master plan classifies regional trunk road networks as (1) Reference Roads, (2) Intermediate Roads and (3) Branch, Link and Connecting Roads, and compiles a list of the network. It is summarized in Table 6.3.

**Table 6.3: SADC regional trunk road network**

Countries	Reference roads	Intermediate roads	Branch, link and connecting roads	Total	Share (%)
Angola	4,600	300	3,600	8,500	13.6
Botswana	1,700	1,200	100	3,000	4.8
DRC	3,900	300	8,900	13,100	21.0
Lesotho	200	-	900	1,100	1.8
Madagascar	1,300	-	-	1,300	2.1
Malawi	4,000	400	200	4,600	7.4
Mauritius	-	-	-	0	0.0
Mozambique	-	1,400	300	1,700	2.7

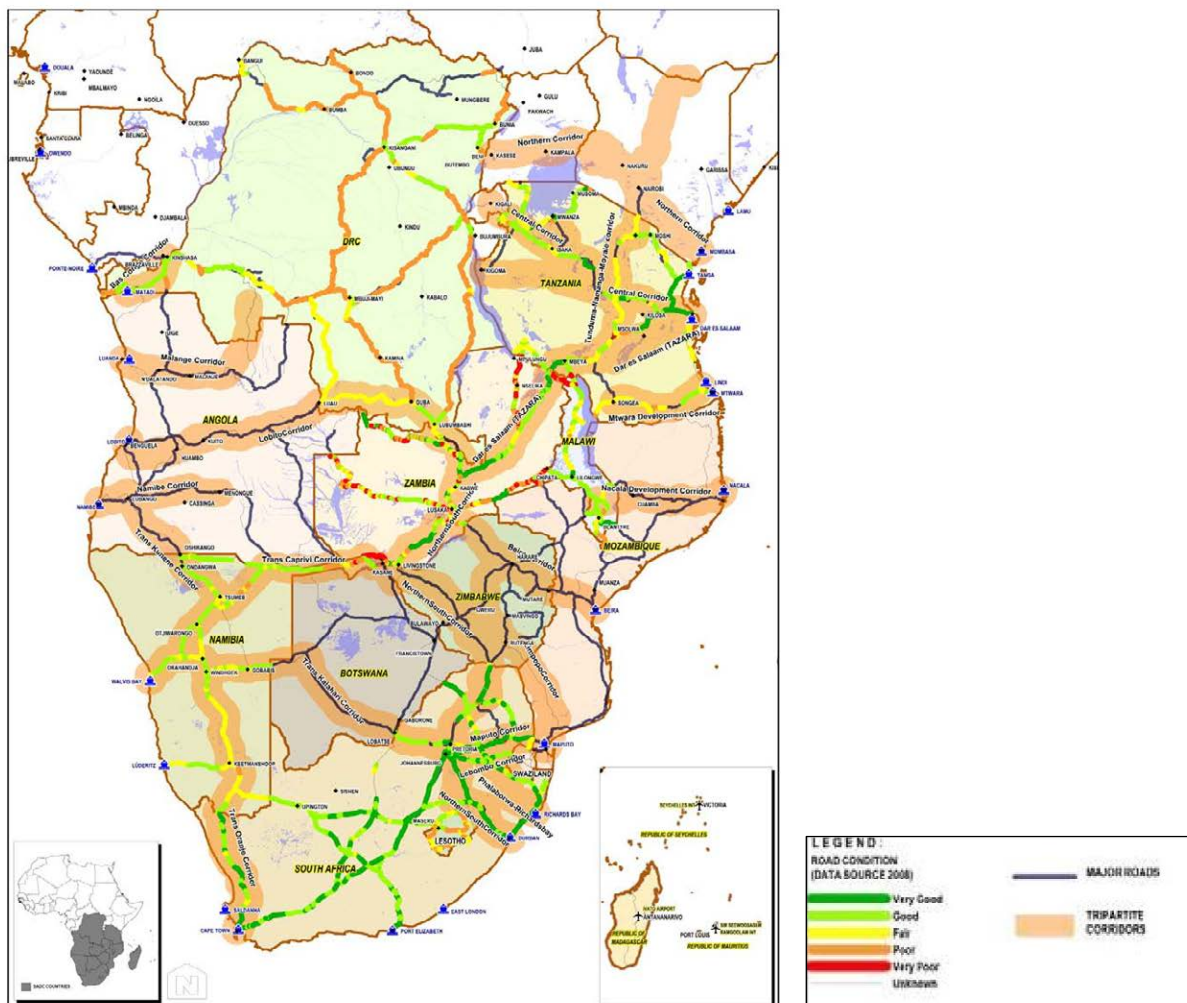
Unit: kilometres

Countries	Reference roads	Intermediate roads	Branch, link and connecting roads	Total	Share (%)
Namibia	2,700	1,200	800	4,700	7.5
Seychelles	-	-	-	0	0.0
South Africa	4,200	2,100	2,400	8,700	13.9
Swaziland	200	-	200	400	0.6
Tanzania	3,300	1,900	1,900	7,100	11.4
Zambia	1,400	1,700	1,400	4,500	7.2
Zimbabwe	1,600	1,000	1,100	3,700	5.9
Total	29,100	11,500	21,800	62,400	100.0

Source: TSP Annexure 5.6

### Road conditions and traffic volume

SADC road network is one of the region’s largest assets in the public sector. Productivity of every economic sector is affected by the quality and related performance of the road system in general.



Source: TSP

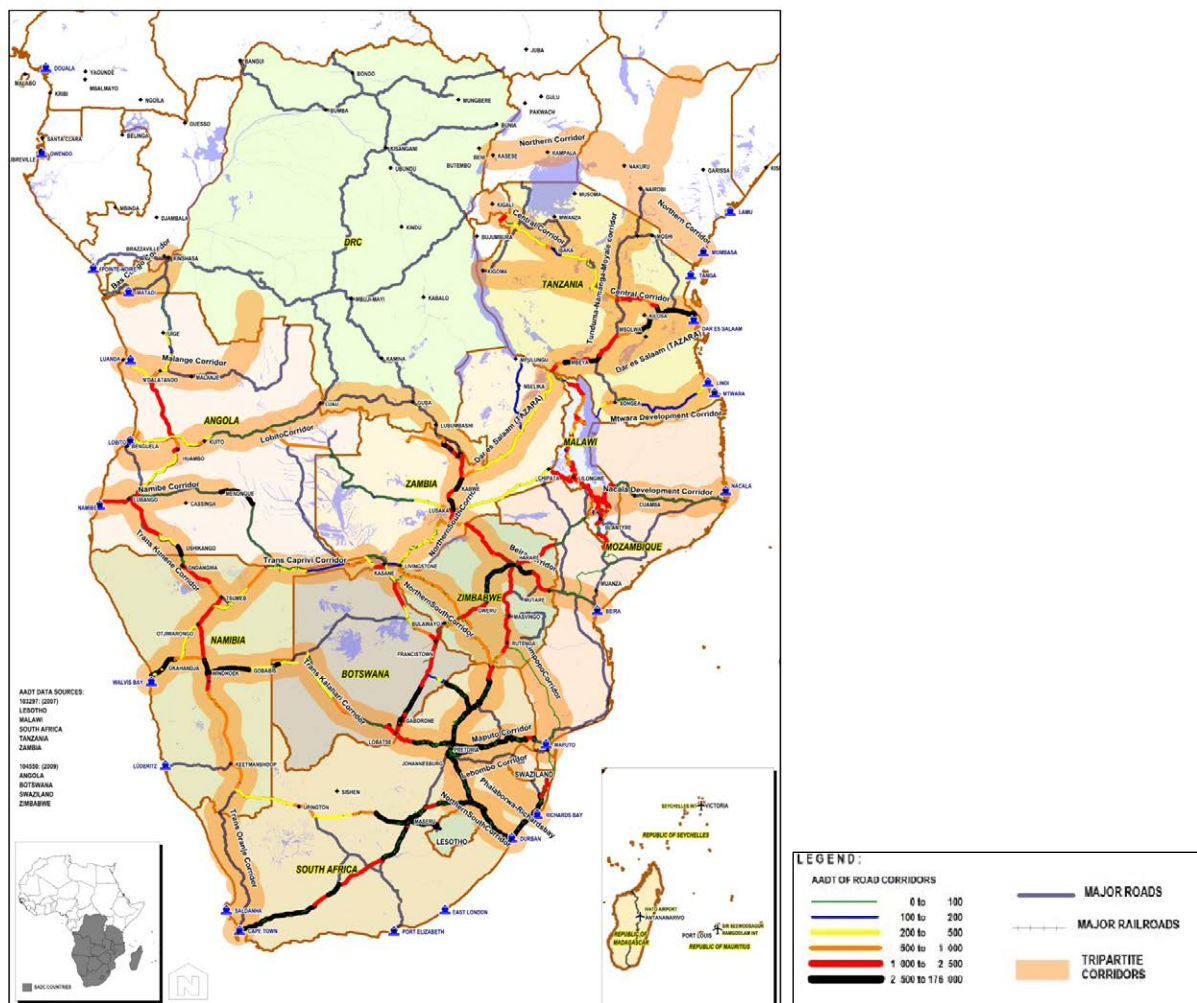
**Figure 6.3: Road conditions**

Road condition is affected by traffic loading. Traffic volume of most regional roads is less than 1,000 vehicles per day (VPD), while some roads exceed 2,000 VPD especially sections near urban areas. In South Africa, traffic volume at dual carriageways near the metropolitan areas accounts for

120,000 VPD, and that between major cities it is 80,000 VPD. In the eastern and southern parts of the region, the road network is fairly dense and in reasonably in good condition. In the west, particularly in Angola and DRC, there is a clear need for new roads, in addition to the urgent need to repair the damages of conflict and neglect, in order to promote economic growth and regional integration.

A major issue across the whole region is the cost of maintenance. Unfortunately, despite the substantial investments made in road transport infrastructure in the past, inefficient management, coupled with inadequate funding, has led to deteriorated road conditions and increased transport costs in many SADC countries.

The road condition in the SADC countries is shown in Figure 6.3 and regional traffic flows is shown in Figure 6.4.



Source: TSP

Figure 6.4: Regional traffic flows

**Capacity**

Road capacity throughout the region and all the main corridor routes does not limit heavy vehicle or

traffic density, except on some of the busy South African highways such as the Durban to Gauteng toll road section of the North - South Corridor. Road traffic constraints in terms of capacity are as follows,

- In major towns, such as Lusaka, Ndola and Harare, where bypasses have not yet been built;
- In road sections with significant grades and truck volumes, where climbing lanes have not been provided; and
- At border posts where truck parking spaces and coordination among agencies is required to expedite the clearance.

Table 6.4 shows the road infrastructure capacity in Namibia. The figures are as estimated in the study titled “Definition and Investment Strategy for a Core Strategic Transport Network for Eastern and Southern Africa”, which was conducted by the World Bank (PPIAF). These capacities were determined from projected trade on the roads, expressed in tons, which was translated into heavy freight vehicles (HFV) per day on the network.

**Table 6.4: Road infrastructure capacity in Namibia**

Road section	Design capacity (HFV per day)	Current throughput (HFV per day)	Capacity constraints
Walvis Bay – Katima Mulilo – Lusaka – Ndola –Lubumbashi	+150	10 to 20	Main constraint is congestion around Lusaka where a bypass is needed, as well as constraints at the Katima Mulilo, Livingstone and Kasumbalesa border posts
Walvis Bay – Angola	±100	45 plus traffic from Cape Town and Gauteng	No congestion on route, but constraint at Oshikango border post

Note: Heavy freight vehicles (HFV) per day – 48t to 56t Gross Vehicle Mass (GVM) in each direction

Source: TSP referred from “Definition and Investment Strategy for a Core Strategic Transport Network for Eastern and Southern Africa”, World Bank, 2011

### 6.1.2.2 Railways

#### Rail network

Many of the regional railway systems in Eastern and southern Africa are not functioning as they should in virtually all respects due to poor reliability, high accident and failure rates, high costs and low volumes, financial losses and unsustainable operations.

The railway networks of SADC member states are closely linked to the ports as shown in Figure 6.5.

#### Railway conditions

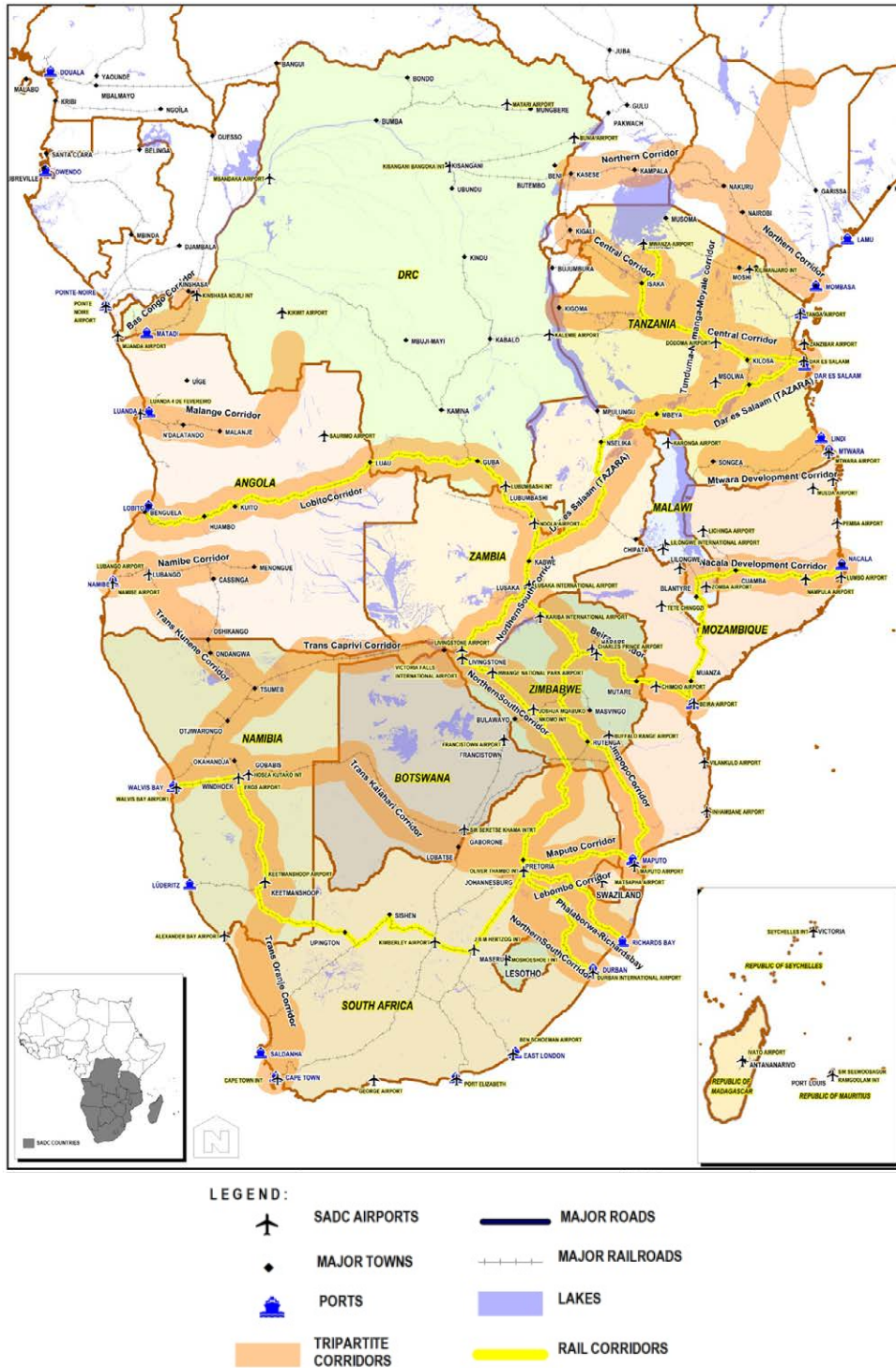
Several railway systems have generally deteriorated because of the following reasons:

- There has been a lack of maintenance and investment. As a result, most of the railways are very run-down and require substantial rehabilitation of both infrastructure and rolling stock;
- During wars and civil disturbances railways are often one of the first targets for destruction and this has affected railways either directly (e.g. Angola and Mozambique) or indirectly by separating inland railways from their ports (e.g. Malawi); and



- Theft of operating equipment has disabled services and tied up available finance in the replacement thereof.

Current railway condition of SADC member states is shown in Figure 6.6.



Source: TSP

Figure 6.5: Rail network of SADC member states



**Legend**

- █ Rail Track Assessment
- █ Good
- █ Fair
- █ Poor
- █ Not in use

**Note**

*The condition of the operational track on the South African TFR is good, relative to the other regional systems – safety, speed restrictions and permissible train lengths are the main criteria. On regional systems outside TFR and the new Sena coal line, the train lengths are limited to between 20 and 40 wagons.*



Note: Excluding South Africa and Namibia  
Source: TradeMark South Africa Website ([www.trademarksa.org](http://www.trademarksa.org))

**Figure 6.6: Regional rail and indicative condition**

**Capacity**

All the regional railway systems are operating well below their original design capacities, but are currently suffering severe capacity constraints because of poor track conditions and poor locomotive and wagon availability. Thus the railway systems are not able to handle more traffic without substantial investment in the repair and upgrading of track and equipment, and the provision of working capital. Table 6.5 shows rail infrastructure capacity in Namibia.

**Table 6.5: Rail infrastructure capacity in Namibia**

Unit: million tons per year

Railway	Design capacity	Current throughput	Capacity constraints
TransNamib	2 million	1.8 million	Number of locomotives and wagons, but they have been increasing each year. The upgrading of the track is contracted for the Kranzberg – Tsumeb section where needed. Very little traffic from South Africa in the southern part.

Source: TSP

### 6.1.2.3 Maritime

#### Network and port conditions

19 major ports in SADC member states were identified as the regional ports in TSP. Most of them are not in good condition, in particular, Beira and Matadi Ports. The location of SADC regional ports is listed in Table 6.6. Table 6.7 indicates challenges of the SADC regional ports.

**Table 6.6: SADC regional ports**

Regional port	Country	SADC economic corridors	Classification by World Port Source
Dar-es-Salaam	Tanzania	Dar es Salaam central	Large seaport
Mtwara	Tanzania	Mtwara	Small pier, jetty or wharf
Maputo	Mozambique	Maputo, Limpopo	Medium seaport
Beira	Mozambique	Beira	Medium seaport
Nacala	Mozambique	Nacala	Small seaport
Durban	South Africa	North-South, Maseru, Durban	Large seaport
Richards Bay	South Africa		Medium seaport
Cape Town	South Africa	Trans-Orange	Medium seaport
Walvis Bay	Namibia	Trans-Caprivi, Trans-Cunene, Trans-Kalahari, Trans-Orange	Small seaport
Luderitz	Namibia	Trans-Orange	Small harbour
Lobito	Angola	Lobito	Medium deep water seaport
Luanda	Angola	Malange	Medium deep water seaport
Namibe	Angola	Namibe	Small harbour
Matadi/Boma	DRC	Bas, Congo	Small river port
Port Elizabeth	South Africa	None	Medium seaport
Toamasina	Madagascar	None	Medium seaport
Port Louis	Mauritius	None	Medium seaport
Victoria	Seychelles	None	Small seaport
Saldanha	South Africa	None	Large jetty

Note: World Port Source (<http://www.worldportsource.com/index.php>) is an Internet website on publicly accessible seaport information. Classification of ports consists of Very large, Large, Medium, Small and Very small.

Source: Regional Infrastructure Development Master Plan Transport Sector

**Table 6.7: Challenges to SADC regional ports**

Challenges	Description
Poor modal interface management – port/road and port/rail	Large numbers of road trucks in the port terminal area often interfere with port operations and harm performance. Rail improvements could reduce the number of trucks entering the port.
Poor materials handling capabilities and infrastructure	Many ports are facing problems such as insufficient materials handling capabilities and infrastructure, irrespective of the apparent capacity and suitability to accommodate certain berths and draught.
Customs and trade challenges	Freight and other goods are often held up for periods as long as two months, rendering many logistic chains ineffective and running at a loss.
Poor location and layout	Most of the ports are surrounded by densely populated and highly industrialised zones, with little or no room for the necessary expansion to handle high port volumes
Poor access	Road access to the ports is often through highly developed business, industrial and residential areas subject to severe traffic congestion. Railway access to container terminals is in most cases inherited and modified from the old break bulk rail system. Ideally, Transport Sector Plan – 11 July 2012 (Version 2.0) 28 both road and rail should have dedicated and unimpeded access to the port terminals from main transport corridors and economic centres
Insufficient berths and drafts	The capacity of ports, especially under conditions where demand is close to (or exceeds) capacity, is a direct function of the number of available berths, the berth size and the allowable draft of such berths.

Source: TSP

## Capacity

Most of the SADC corridor ports are currently operating close to their capacity. The capacity of the port infrastructure in Walvis Bay is estimated in “Definition and Investment Strategy for a Core Strategic Transport Network for Eastern and Southern Africa” as shown in Table 6.8.

**Table 6.8: Estimated port infrastructure capacity in Namibia**

Kinds of cargo	Design capacity	Current throughput	Main capacity constraints
Total	More than 5 million ton per year	5 million ton per year	Port is engaged in a major expansion plan designed to raise capacity. Current volumes are as of 2007 – 2008.
Container	250,000 TEUs	250,000 TEUs	New terminal being built – up to 1,000,000 TEUs in total per year

Source: TSP based on the analysis of “Definition and Investment Strategy for a Core Strategic Transport Network for Eastern and Southern Africa”, World Bank, 2011

### 6.1.2.4 Aviation

There are numerous airports and airstrips in SADC member states. OR Tambo Airport in Ekurhuleni (next to Johannesburg) is the largest airport in southern Africa. Not only is it the major hub for intercontinental flights, but it also acts as regional hub, with most air travel between SADC capitals.

Traffic is very concentrated in the few airport hubs in the region. The number of airports is stable, and enough runways exist to handle traffic, with better scheduling and minor investment in parallel taxiways and some terminal facilities required.

### 6.1.2.5 Major issues by transport modes

Table 6.9 summarise major issues by transport modes that were identified in the TSP.

**Table 6.9: Summary of major issues by modes**

Modes	Major issues	
Road	Conditions	<ul style="list-style-type: none"> <li>- Roads not maintained due to high cost of maintenance</li> <li>- Poor condition due to damages resulting from conflict and neglect in the DRC and Angola</li> <li>- Missing links in Angola, Tanzania and the DRC</li> </ul>
	Bottlenecks	<ul style="list-style-type: none"> <li>- Occasional congestion between Gauteng and Durban</li> <li>- Delays at cities where bypasses have not yet been built (Lusaka, Ndola and Harare)</li> <li>- Capacity constraints on roads with significant grades where climbing lanes have not been provided</li> <li>- Delays at border</li> </ul>
Railway	Conditions	<ul style="list-style-type: none"> <li>- Lack of maintenance and investment</li> <li>- Damage as result of conflict</li> <li>- Theft of operating equipment</li> </ul>
	Capacity	<ul style="list-style-type: none"> <li>- Poor track condition (Kigoma, Nacala, Harare, National Railways of Zimbabwe, Beitbridge–Bulawayo Railway, Zambia, DRC)</li> <li>- Poor locomotive and wagon availability (Kigoma, Harare, Maputo, National Railways of Zimbabwe, Beitbridge–Bulawayo Railway, DRC, Trans–Namib, Botswana)</li> <li>- Collapsed marine services on Lake Victoria. Discontinuity as a result of railway condition</li> </ul>
Maritime	Conditions	<ul style="list-style-type: none"> <li>- Poor modal interface management – port/road and port/rail</li> <li>- Poor location and layout</li> <li>- Poor access</li> <li>- Mobile cranes and shops gear (Mtwara, Lobito)</li> <li>- Depth constraints (Beira)</li> <li>- Congested (Luanda)</li> <li>- Poor condition (Matadi and Beira)</li> </ul>
Aviation	Conditions	<ul style="list-style-type: none"> <li>- Inadequate runways (Angola, Blantyre, Zimbabwe, Lesotho)</li> <li>- Inadequate terminals (Angola, Dar es Salaam, Ndola, Zimbabwe)</li> </ul>

Source: TSP

### 6.1.2.6 Identification of priority regional corridors

The identification of priority regional corridors is directly related to the function that corridors are expected to perform. The primary policy of SADC is to link major production and consumption points with corridors having maritime gateways at the ends. The regional road transport corridors are shown in Table 6.10.

**Table 6.10: Identified regional road transport corridors**

Priority	Corridors
High	North-South, Maputo and Dar es Salaam
Medium	<b>Trans-Kalahari</b> , Beira, Nacala, <b>WNLDC</b> , Central, Trans-Orange, Lobito
Low	<b>Trans-Cunene</b> , Limpopo, Namibe, Malange, Bas Congo, Mtwara and Maseru - Durban

Note: Corridors in bold characters are related to Namibia

Source: TSP

### 6.1.2.7 Corridor ranking and priority projects

Table 6.11 shows trade flow volume by economic corridors in 2009 and 2030. These trade figures are estimated in TSP. The top four corridors with the highest assigned trade flows remain in the same position for 2009 and 2030.

**Table 6.11: Trade flow by corridors in 2009 and 2030**

Rank	2009		2030	
	Corridor	Trade flow (tons)	Corridor	Trade flow (tons)
1	North-South Corridor	586,863	North-South Corridor	2,347,623
2	Lebombo Corridor	434,528	Lebombo Corridor	1,879,142
3	Maputo Corridor	397,611	Maputo Corridor	1,661,006
4	<b>Trans-Kalahari Corridor</b>	<b>382,110</b>	<b>Trans-Kalahari Corridor</b>	<b>1,640,726</b>
5	Limpopo Corridor	210,469	Limpopo Corridor	708,029
6	Richards Bay-Phalaborwa Corridor	139,669	Lobito Corridor	663,671
7	Beira Corridor	139,032	Richards Bay-Phalaborwa Corridor	662,024
8	Central Corridor	97,145	<b>Trans-Orange Corridor</b>	<b>594,345</b>
9	Dar-es-Salaam (TAZARA)	93,451	Beira Corridor	518,745
10	<b>Trans-Orange Corridor</b>	<b>89,157</b>	Dar es Salaam (TAZARA)	511,999
11	<b>WNLDC</b>	<b>88,522</b>	Central Corridor	456,597
12	Tunduma-Namanga-Moyale corridor	51,975	<b>WNLDC</b>	<b>420,729</b>
13	Bas Congo Corridor	37,444	Tunduma-Namanga-Moyale Corridor	255,321
14	Malange Development Corridor	34,582	Trans-Cunene Corridor	112,521

Note: Corridors in bold figures are related to Namibia

Source: TSP

TSP set the priorities of the transport infrastructure based on the ranking above. Priority projects related to Namibia according to trade flow volume on corridors are shown in Table 6.12.

**Table 6.12: Priority projects relevant to Namibia**

Project title	Project description	Sector	Corridor
<b>High trade flow corridor projects</b>			
BGSP 13 Walvis Bay	Port expansion	Port	Trans–Kalahari Corridor
CSTN Vol. 4, No. 18 Walvis Bay bulk and break–bulk handling	The relocation of some operations is recommended	Port	Trans–Kalahari Corridor
CSTN Vol. 4, No. 19 Walvis Bay VTS/port control	The port will relocate the port control system to an area adjacent to the present radar tower	Port	Trans–Kalahari Corridor
CSTN Vol. 4, No. 20 Road improvements on the Namibian section of the Trans–Kalahari	716 km of the original highway is being rehabilitated and widened in several phases	Road	Trans–Kalahari Corridor
CSTN Vol. 4, No. 30 Botswana dry port at Walvis Bay		Port	Trans–Kalahari Corridor
MSP No. 18 Trans–Kalahari–Mamuno OSBP	Establishing Mamuno–Trans–Kalahari border post OSBP	OSBP	Trans–Kalahari Corridor
MSP No. 61 New Walvis Bay container terminal on reclaimed land	Namport: Construction of a modern 30 hectare container terminal to expand the Walvis Bay port’s container and bulk handling capacity	Port	Trans–Kalahari Corridor
MSP No. 62 New tanker berth	Namport: Construction of a new tanker berth (a modern marine petroleum offloading facility) in Walvis Bay	Port	Trans–Kalahari Corridor
MSP No. 63 Ship and rig repair quay	Namport: The new ship and rig repair quay will see the construction of a new jetty suitable for two large, semisubmersible oil rigs as well as drill ships	Port	Trans–Kalahari Corridor
MSP No. 64 Walvis Bay marina development	Namport: Allow a private investor to build, operate and own a modern facility through a long–term concession	Port	Trans–Kalahari Corridor
<b>Low trade flow corridor projects</b>			
CSTN Vol. 4, No. 18 Walvis Bay bulk and break bulk handling	The relocation of some operations is recommended	Port	Trans–Orange Corridor
CSTN Vol. 4, No. 19 Walvis Bay VTS/port control	The port will relocate the port control system to an area adjacent to the present radar tower	Port	Trans–Orange Corridor
CSTN Vol. 4, No. 20 Road improvements on the Namibian section of the Trans–Kalahari	716 km of the original highway is being rehabilitated and widened in several phases	Road	Trans–Orange Corridor
CSTN Vol. 4, No. 22 Rehabilitation of the railway between Kranzberg and Tsumeb	This 322 km section of the track was seriously degraded and needed rehabilitation. The northern extension to Angola depends on the strengthening of this section of the route	Rail	Trans–Cunene Corridor
CSTN Vol. 4, No. 23 ICD at Tsumeb	To handle the increased volumes estimated for the route	Road	Trans–Cunene Corridor
CSTN Vol. 4, No. 24 Upgrade Rundu–Oshikango Road	Involves paving the 501 km gravel route across Namibia with bitumen	Road	Trans–Cunene Corridor
CSTN Vol. 4, No. 25 Road link from Tsumeb to Katwitwi	This 258 km segment of gravel road is being paved as it is part of an increasingly active trade route between Namibia and southern Angola. Bonded warehouses are also being constructed on the Namibian side	Road	Trans–Cunene Corridor
CSTN Vol. 4, No. 26 Extension of Trans–Namib from Ondangwa to Oshikango	Extension of Trans–Namib from Ondangwa to Oshikango	Road	Trans–Cunene Corridor
MSP No. 10 Oshikango/Santa Clara OSBP	If an OSBP is contemplated, the new facility could be dedicated to road and rail freight and the current border crossing used for pedestrian and non–commercial vehicle traffic	OSBP	Trans–Cunene Corridor
MSP No. 61 New Walvis Bay container terminal on reclaimed land	Namport: Construction of a modern 30 hectare container terminal to expand the Walvis Bay port’s container and bulk handling capacity	Port	Trans–Orange Corridor
MSP No. 62 New tanker berth	Namport: Construction of a new tanker berth (a modern marine petroleum offloading facility) in Walvis Bay	Port	Trans–Orange Corridor

Project title	Project description	Sector	Corridor
MSP No. 63 Ship and rig repair quay	Namport: The new ship and rig repair quay will see the construction of a new jetty suitable for two large, semisubmersible oil rigs as well as drill ships	Port	Trans-Orange Corridor
MSP No. 64 Walvis Bay marina development	Namport: Allow a private investor to build, operate and own a modern facility through a long-term concession	Port	Trans-Orange Corridor
MSP No. 9 Katima Mulilo Wenela OSBP	Establishing Katima Mulilo-Wenela OSBP	OSBP	WNLDC

Source: TSP

## 6.2 Review of transport master plans in Namibia

### 6.2.1 Namibia Integrated Transport Master Plan

This master plan was funded by the European Investment Bank with the aim to assist the Government of Namibia in developing reliable transport infrastructure over the next 20 years. The plan's development strategies were designed to improve the planning of an integrated multimodal transport system.

The plan aims to foster infrastructure that develops Namibia's status to a regional hub while meeting the socio-economic needs of Namibians. As a regional hub, the Namibian transport sector has the potential to benefit the economy and play a vital role in raising the Sub-Saharan Africa regional economic development level.

#### 6.2.1.1 Overview of the transport sector and direction of development strategies

The Transport Master Plan in its "transport sector diagnosis" examined the four main modes of transport: road, rail, water and air in Namibia. The results of their assessment are as the followings.

##### Road

Roads currently support around ninety per cent (90%) of all freight and passenger transport in Namibia, which include regional and transit traffic. There are 44,000 kilometres of roads, of which 6,660 kilometres are paved and almost 60% (3,900 kilometres) of paved roads are international transit corridors. Their condition has been steadily deteriorating since the country became independent in 1990, so that (9%) is in "Poor" or "Very poor" condition (representing approximately 600 kilometres) now.

The strategies include prioritising rehabilitation over creation of new routes, increasing the resources available for maintenance and improvement of the technical capabilities of the regulating authorities.

##### Railway

The total length of the rail network in operation is 2,483 kilometres. The poor condition of the infrastructure and aged locomotives means that freight traffic is being severely handicapped by the poor service levels and low safe operation speeds. The economic evaluation showed that the



construction of new lines is not economically viable for non-mineral traffic within the scope of the 20-year plan.

The strategies included fully rehabilitating the existing network before considering expansion and supporting railway operators in order to make services comparable to road services.

### **Port**

Port operations are handicapped by relatively low productivity at the container terminal that receives about fifty per cent of the total traffic. Low productivity is caused by poor layout and a lack of skilled labour. The maximum draught is 10.6 metres, which limits the maximum size of vessels to carriers with a capacity of less than 30,000 tons, which results in high operating costs<sup>2</sup>. There is currently no official long-term master plan for the development of the port. The strategies include that Phase 2 of the new container terminal in Walvis Bay project is to be implemented before 2030 and the progressive development of dry bulk facilities designed to cater for large bulk carriers on the new site<sup>3</sup>.

### **Aviation**

There are as many as 400 airstrips in Namibia, due to the extent of the country, with only 45 being officially registered and considered as vital for the economic development of the country. The 8 most important airports are owned and managed by the Namibia Airports Company. Most of the airstrips are in poor or very poor condition and become more dangerous every year due to the absence of maintenance.

The strategies include airstrip rehabilitation, development of airport facilities to accommodate an increase in traffic, support of key aviation companies and revision of aviation legislation to bring them up to modern standards.

#### **6.2.1.2 Multimodal scenarios**

To propose the optimum phased programme of investments the Integrated Transport Master Plan Study adopted a scenario approach that analysed the impact in terms of improved transport efficiency across the transport networks. These scenarios were based upon different combinations of rail/road projects of strategic interest at national and international level (SADC level).

These scenarios were to identify, present and analyse the followings points,

- Road/rail development scenarios consistent with the strategies
- Difference in economic impacts by variation of the implementation schedule for the road and rail strategic projects which have been identified during the diagnostic phase and tested with the transport model

---

<sup>2</sup> It had been deepened already to 14.4 metres as of June 2011. Refer to section 5.3 “Port Development in Namibia.”

<sup>3</sup>A long-term plan has been drafted as of 2014. Refer to section 5.3 “Port Development in Namibia.”

- Scenarios were analysed and compared from a purely economic point of view
- Scenarios were compared using a more comprehensive approach based on the screening criteria and methodology developed

### Strategic projects

The findings of the diagnostic and the output of the traffic modelling analyses have identified a long list of infrastructure and supporting capacity development projects aimed at developing Namibia as:

- An international transport hub for Sub-Saharan Africa given the location of its strategic Atlantic Ocean deep sea port on the coast of South West Africa, and
- An upper middle level income economy.

A brief summary of the scenarios is indicated in Table 6.13.

**Table 6.13: Brief summary of scenarios**

Scenarios		Contents	List of physical projects
0	Without road	Re-engineering of TransNamib	None
1	Without rail rehabilitation /upgrading (rail interrupted in 2020)	Road rehabilitation only - rail interrupted in 2020	RO1
2		Road rehabilitation, construction of new paved corridors & capacity improvement (R10) - rail interrupted in 2020	RO1, RO2, RO3, RO5, RO6, RO7, RO8, RO9, RO10
3		Road rehabilitation, construction of new paved corridors & capacity improvement (R04) - rail interrupted in 2020	RO1, RO2, RO3, RO4, RO5, RO6, RO7, RO8, RO9
4	With rail rehabilitation / upgrading but w/o new Trans-Kalahari	Rail rehabilitation / upgrading + road rehabilitation only	RA1, RA2, RA3, RA4, RO1
5		Rail rehabilitation / upgrading + road rehabilitation & capacity improvement (RO10)	RA1, RA2, RA3, RA4, RO1, RO7, RO8, RO9, RO10
6		Rail rehabilitation / upgrading + road rehabilitation & capacity improvement (RO4)	RA1, RA2, RA3, RA4, RO1, RO4, RO7, RO8, RO9
7		Rail rehabilitation / upgrading + road rehabilitation, capacity improvement (RO10) & construction of new paved corridors	RA1, RA2, RA3, RA4, RO1, RO2, RO3, RO5, RO6, RO7, RO8, RO9, RO10
8		Rail rehabilitation / upgrading + road rehabilitation, capacity improvement (RO4) & construction of new paved corridors	RA1, RA2, RA3, RA4, RO1, RO2, RO3, RO4, RO5, RO6, RO7, RO8, RO9
9	With rail rehabilitation / upgrading & trans-Kalahari	Idem 4 + new trans-Kalahari railway line	RA1, RA2, RA3, RA4 +TRKLHR railway, RO1
10		Idem 5 + new trans-Kalahari railway line	RA1, RA2, RA3, RA4 +TRKLHR railway, RO1, RO7, RO8, RO9, RO10
11		Idem 6 + new trans-Kalahari railway line	RA1, RA2, RA3, RA4 +TRKLHR railway, RO1, RO4, RO7, RO8, RO9
12		Idem 7 + new trans-Kalahari railway line	RA1, RA2, RA3, RA4 +TRKLHR railway, RO1, RO2, RO3, RO5, RO6, RO7, RO8, RO9, RO10
13		Idem 8 + new trans-Kalahari railway line	RA1, RA2, RA3, RA4 +TRKLHR railway, RO1, RO2, RO3, RO4, RO5, RO6, RO7, RO8, RO9

Resource: Namibia Integrated Transport Master Plan

The identified strategic rail and road projects are shown in Table 6.14 and Table 6.15.

**Table 6.14: Road projects**

	Type of works	Classification of road/section	Distance (km)	Scenario 7
RO1-a	Rehabilitation	B1 :Grunau to Windhoek	630	*
RO1-b	Rehabilitation	B1: Windhoek to Otjiwarango	210	*
RO1-c	Rehabilitation	Trans-Kalahari corridor: Windhoek and the border with Botswana	260	*
RO1-d	Rehabilitation	WNLDC		*
RO1-e	Rehabilitation	Trans-Cunene corridor: Tsumeb, Ondangwa and Oshakati		*
RO1-f	Rehabilitation	Trans-Cunene corridor WNLDCs		*
RO2	New paved road	Otjinene to Okatjoruu		*
RO3	New direct paved road	Alternative to trans-Cunene corridor: Walvis Bay to northern Namibia		*
RO4	New paved road	Walvis Bay – Windhoek via Us Pass		
RO5	Upgrading to bitumen standard	Alternative route to trans-orange corridor: Walvis Bay – Solitaire – Goabeb		
RO6	New road	Walvis Bay and TR2 at Swakopmund (behind the dune but parallel to it)		
RO7	Capacity improvement	Windhoek – Okahandja road		*
RO8	Capacity improvement	Windhoek – Rehoboth road		*
RO9	Capacity improvement	Windhoek – Hosea Kutato International Airport (HKIA)		*
RO10	Capacity improvement	Okahandja – Walvis Bay		*

Resource: Namibia Integrated Transport Master Plan

**Table 6.15: Rail projects**

	Type of works	Section	Distance (km)	Scenario 7
RA1	Rehabilitation/Upgrading	Kranzberg – Tsumeb	396	*
RA2	Rehabilitation/Upgrading	Walvis – Bay - Kranzberg	210	*
RA3	Rehabilitation/Upgrading	Kranzberg – Windhoek	210	*
RA4	Rehabilitation/Upgrading	Windhoek and the border with South Africa at Ariamsvlei/ Nakop	866	*
RA5	Construction	New trans-Kalahari railway line		

Resource: Namibia Integrated Transport Master Plan

### **Evaluation of the scenarios**

Finally, considering the results of the economic evaluation and of the scenario screening, the optimum rail-road scenario would be “Scenario 7” (or possibly Scenario 12, depending upon the future of the trans-Kalahari railway) which is also the best performing scenario in terms of developing and promoting Namibia as a main international transport hub in Southern Africa. “Scenario 7” considers the following projects:

- Re-engineering of TransNamib (possibly via PPP) and rehabilitation / upgrading of the existing rail network (RA1, RA2, RA3 & RA4);
- Rehabilitation of the core paved road network (RO1) (1,200 km);
- Road capacity improvement along the Walvis Bay – Windhoek corridor (RO7, RO8, RO9 & RO10);
- Creation of new paved corridors (by upgrading unpaved corridors to bitumen standards)

(RO2, RO3, RO5, RO6)

- And possibly, for scenario 13 only, construction of the new trans-Kalahari railway line (subject to private financing).

### 6.2.2 National Development Plan 4 (NDP4)

NDP4 is the fourth 5-year development plan to lead Namibia towards realizing Vision 2030. NDP 4 is a higher-level plan, characterized by fewer and more carefully selected and sequenced goals and associated target values in comparison with NDP3.

Preparation of the detailed programmes on how to achieve the various NDP4 goals and targets are delegated to the various offices, ministries and agencies responsible for the relevant sectors. The Ministry of Works and Transport has prepared the execution plan for the Namibian transport sector for the current five years (2013 – 2017). Details of the execution plan are described in 6.2.3.

According to NDP4, Namibia expects a significant increase in transport, boosted, among others, by the expansion of Walvis Bay Port and the comparative advantage of a well-maintained road network. To realise Namibia's expectation, it is imperative to extend the capacity at Walvis Bay Port, and to upgrade the complementary rail and road infrastructure. NDP4 has two pertinent desired outcomes for the five-year planning horizon in terms of transport infrastructure.

**DESIRED OUTCOME 5.1 (DO5.1):** By 2017, Namibia shall have a well functioning, high quality transport infrastructure connected to major local and regional markets as well as linked to the Port of Walvis Bay: 70 per cent of railway network to comply with SADC axle load recommendation of 18.5 tonnes.

**DESIRED OUTCOME 6 (DO6):** By 2017, the volume in cargo handling and rail-transported cargo is double that of 2012, and the Port of Walvis Bay has become the preferred African West coast port and logistics corridor for southern and central African logistics operations.

NDP4 also sets high-level strategies to achieve the decided outcomes. The high-level strategies for outcomes 5.1 and 6 and main responsible player/agent are tabulated as indicated in Table 6.16

**Table 6.16: Desired Outcome (DO5.1 and DO6) and related high-level strategy**

Desired outcome	High-level strategy (due date)	Main role player/agent responsible
By 2017, Namibia shall have a well functioning, high quality transport infrastructure connected to major local and regional markets as well as linked to the Port of Walvis Bay: 70% of railway network to comply with SADC axle load recommendation of 18.5 tons.  Ministry of Works and Transport	Ensure the timely expansion of the Port of Walvis Bay (2015)	Ministry of Works and Transport
	Renovate and maintain critical sections of the core rail network (2012)	Ministry of Works and Transport
	Renovate and maintain of critical sections of the road network (2015)	Ministry of Works and Transport
	Strike a balance between maintaining and expanding the road network (2012)	Ministry of Works and Transport
	Ensure aviation security, development and maintenance as well as the availability of an integrated Transport Master Plan for 2030	Ministry of Works and Transport

Desired outcome	High-level strategy (due date)	Main role player/agent responsible
	(2012)	
	Upgrade the Hosea Kutako International Airport (2017)	Ministry of Works and Transport
By 2017, the volume in cargo handling and rail-transported cargo is double that of 2012, and the Port of Walvis Bay has become the preferred African West coast port and logistics corridor for southern and central African logistics operations.  Ministry of Works and Transport	Maintain and expand critical infrastructure (see also all DO5s; 2017)	Ministry of Works and Transport
	Make land available in Walvis Bay and in other municipalities along Corridor routes to support logistics activities (2017)	Ministry of Regional and Local Government, Housing and Rural Development
	Put in place a public-private partnership funding framework to create synergies and funding for the logistics hub (2012)	Ministry of Finance
	Transform the Walvis Bay Corridor Group, moving away from its focus on transport to a focus on logistics and distribution (2012)	Ministry of Works and Transport
	Pursue international and bilateral agreements to ease the cross-border flow of goods (On-going)	Ministry of Trade and Industry
	Identify and develop the skills necessary to make the logistics hub a reality, i.e. focus on long-term development as well as short-term measures, including attraction of expatriates (2012)	National Planning Commission
	Develop a National Logistics Master Plan, detailing Namibia as an international logistics hub, including images of networks, population distribution, and the spatial distribution of economic growth and job creation (2013)	National Planning Commission
	Develop a Master Plan on Regional Urban Centres, with a focus on the greater coastal area, an inland hub, the northern core Regions, and various border towns (2014)	Ministry of Regional and Local Government, Housing and Rural Development

Source: Namibia's Fourth National Development Plan: NDP4, NPC, 2012

MWT is responsible for implementation of all high-level strategies (6 strategies) to achieve DO5.1. In order to achieve DO6, MWT, NPC, MRLGHRD and MOF are responsible for the implementation of high-level strategies, and coordination of the ministries is needed.

### 6.2.3 Namibia Transport Sector Plan 2013–2017

MWT prepared a sectoral execution plan titled “Namibia Transport Sector Plan 2013–2017” based on the desired outcomes, strategic initiatives and contribution of the NDP4 goals that are indicated in section 6.2.2. The Namibia Transport Sector Plan covers five years from 2013 to 2017 in line with the desired outcomes of NDP4.

The Namibia Transport Sector Plan defines sub-sectors’ contribution to NDP4 goals: high and sustained economic growth, increased income equity and employment creation as indicated in Table 6.17 (road sub-sector), Table 6.18 (rail sub-sector), Table 6.19 (aviation sub-sector), and Table 5.20 (maritime sub-sector).

**Table 6.17: Road sub-sector's contribution to NDP4 goals**

Strategic Initiative	Contribution to the NDP4 goals		
	High and sustained economic growth	Increased income equality	Employment creation
Strike a balance between preservation and expanding the road network	Increased movement of goods Increased safety of goods People, increased tourism	Reduction of transport costs and improved market access will benefit rural and urban poor	Several permanent and temporal jobs will be created: blading, re-surfacing will employ many unskilled: grass cutting, road sign manufactures, bitumen manufactures, security guards, engineers. Improved market access will generate job opportunities
Renovate, upgrade and maintain critical sections of the road network	Increased movement of goods Increased safety of goods People, increased tourism		Several permanent and temporal jobs will be created: blading, re-surfacing will employ many unskilled: grass cutting, road sign manufactures, bitumen manufactures, security guards, engineers. Improvement of public transport will have significant spill-over effects
Revision and implementation of funding structure	Adequate funding and budgeting improves efficiency and reduces budgeting needs	–	–
Skill development programme	Skilled labour force will ensure the sustainability of the investments infrastructure	Will earn more as skilled people. Each job in Namibia supports at least 4 dependents or family members.	Skilled people will be able to replace outsourced jobs. Innovation and multiplier effects creating more jobs

Source: Namibia Transport Sector Plan (2013-2017)

**Table 6.18: Rail sub-sector's contribution to NDP4 goals**

Strategic Initiative	Contribution to the NDP4 goals		
	High and sustained economic growth	Increased income equality	Employment creation
Rehabilitate and Maintain critical sections of the core rail network	Increased speed movement and safety of goods and people. Stimulate economic growth and spinoff effect in other economic sub-sectors. Ensure rail transportation service reliability, continuity and sustainability. More freight and passengers will be transported by means of rail	More people will have an improved and stable income. The low-income threshold will be improved thus reducing income disparity. Structured poverty will be reduced.	Create new direct and indirect, permanent and temporal jobs in the fields of operations, maintenance and repairs. Encourage self-employment opportunities.
Upgrade of core rail lines		Functioning and well-maintained rolling stock will foster job security	
Acquire/replace rolling stock		Same with Rehabilitation and Upgrade	
Development of new rail lines (major local and regional linkages/markets)			

Source: Namibia Transport Sector Plan (2013-2017)

**Table 6.19: Aviation sub-sector's contribution to NDP4 goals**

Strategic Initiative	Contribution to the NDP4 goals		
	High and sustained economic growth	Increased income equality	Employment creation
Upgrade strategic airports	Upgraded airports will attract tourists will be used by mining and private sector for business as well as personal travel. This will contribute to sustained economic growth.	More people will move from zero income to something at least. We should see drop from 51% unemployment.	Contractors, SMEs, casual and permanent employees will be required for the upgrades.



Strategic Initiative	Contribution to the NDP4 goals		
	High and sustained economic growth	Increased income equality	Employment creation
Regulate Aviation	Compliance to international and local aviation legislation/ requirements will ensure continued operation.	-	-
Optimise cargo and passenger handling system	Effectiveness, efficiency and optimization will lead to increased market share and hence growing and sustainable economic growth.	-	-

Source: Namibia Transport Sector Plan (2013-2017)

**Table 6.20: Maritime sub-sector's contribution to NDP4 goals**

Strategic Initiative	Contribution to the NDP4 goals		
	High and sustained economic growth	Increased income equality	Employment creation
Maintain and Expand Critical Infrastructure	This will lead to increased movement of goods and people, increased safety of goods and people, increase ships making Walvis Bay their port of call	More people will get better income opportunities. We should see a drop from 51% unemployment.	This will create several permanent and temporal jobs
Make land available in Walvis Bay and in other Municipalities along corridor routes to support logistics activities	This will lead to improved logistical efficiencies	More people will get better income opportunities. We should see a drop from 51% unemployment.	This will create several permanent and temporal jobs
Transform the WBCG moving away from its focus on transport to a focus on logistics and distribution	This will lead to improved logistical efficiencies	-	-
Identify and Develop skills necessary to make logistics hub a reality i.e. long term development short term measures	Skilled people will ensure sustainability via maintenance of quality and innovation	More people will get better income opportunities. We should see a drop from 51% unemployment	Skilled staff lead to staff retention and multiplier effect
Develop a National logistics Master Plan detailing Namibia as an international logistics hub	This will lead to improved logistical efficiencies	-	-
Develop a Master Plan on Regional Urban Centre, with focus on the greater coastal area, an inland hub, the Northern core Regions, and various border town	This will lead to improved logistical efficiencies	-	-
Pursue international and bilateral agreements to ease the cross-border flow of goods	This will lead to improved logistical efficiencies	-	-
Put in place a public private partnership funding framework to create synergies and funding for the logistics and distribution	This will promote sustainability and profitability	More people will get better income opportunities. We should see a drop from 51% unemployment.	Extra funding will create several permanent and temporal jobs
NEW NDP SI: Propose Review of Maritime Legal Framework	This will lead to improved logistical efficiencies	-	-

Source: Namibia Transport Sector Plan (2013-2017)

The Namibia Transport Sector Plan also compiles lists of projects classified by strategic initiatives of NDP4. Table 6.21 indicates the estimated expenditure by sub-sectors. The total expenditure amounts to N\$54.5 billion<sup>4</sup> from 2013 to 2017. The report estimates an expected budget of N\$51.8 billion from the Medium-term Expenditure Framework (MTEF) during the period, and points out a N\$2.7 billion gap in funding.

**Table 6.21: Estimated expenditure of Transport Sector Plan from 2013 to 2017**

Unit: N\$000

Transport sector	Expenditure amount
Rail	11,520,600
Road	33,207,500
Aviation	3,800,000
Maritime	4,335,400
Works	1,657,600
Total	54,521,100

Source: Namibia Transport Sector Plan (2013-2017)

### 6.3 Port development in Namibia

Namibia has two harbours, namely Walvis Bay Port in the Erongo Region and Lüderitz Port in the Karas Region, handling merchandise imports and exports and servicing the fishing industry. These two ports are not only the gateway to Namibia but also origin/destination points for transportation of cargo or economic corridors to neighbouring and landlocked countries.

**Table 6.22: Relationship between ports and corridors**

Port	Corridors	Routes and countries
Walvis Bay	Trans – Kalahari Corridor (TKC)	Johannesburg and Pretoria in South Africa via Gaborone in Botswana to the Port of Walvis Bay
	Walvis Bay – Ndola – Lubumbashi Development Corridor (WBNLDC) (WNLDC)	Port of Walvis Bay with Zambia, the Katanga Region in the Democratic Republic of Congo (DRC) and Zimbabwe
	Trans – Cunene Corridor (TcuC)	Port of Walvis Bay to Oshikango – southern Angola up to Lubango
	Trans – Orange Corridor	Johannesburg and Pretoria in South Africa via Keetmanshoop and Windhoek to Walvis Bay Port
Lüderitz	Trans – Orange Corridor	Johannesburg and Pretoria in South Africa via Keetmanshoop to Lüderitz Port

Source: Walvis Bay Corridor Group

#### 6.3.1 Organization and human resource of Namport

Namibian Port Authority (Namport) was established as a state owned enterprise in 1999. Namport's activities are supervised and controlled by the Ministry of Works and Transport (MWT) and the Ministry of Finance (MOF). Namport manages two ports: Walvis Bay Port and Lüderitz Port.

Namport is managed by a board of directors consisting of five members appointed by the Ministers in charge of works and transport, finance and fisheries and marine resources.

Namport's headquarters is located in Walvis Bay, and it has one branch in Lüderitz. Table 6.23

<sup>4</sup> The estimated expenditure includes Works sub-sector (N\$1.7 billion). Most of the projects are government building projects.

shows Namport's organization.

**Table 6.23: Namport's organization**

Management	Board of Directors	
	Chief Executive Officer assisted by a chief internal auditor, a legal advisor and manager for organizational performance	
Administration (Department)	Operation	Container Terminal, Bulk and Break Bulk Division, Marine Division (Port Captain, Pilots, Tugs, Mooring), Technical Division (Mechanic, Electricity, Lighthouse), Syncrolift Division, the Port of Lüderitz
	Port Engineering (contract implementation for new works and port maintenance)	
	Finance	
	Human Resources	
	Marketing	
	Projects	
	SHREQ (safety, risk management, quality)	

Source: Namibia Integrated Transport Master Plan

The Port Captain appointed by the board of directors manages each port within the jurisdiction of Namport.

In April 2014, Namport employed a staff complement of 853 including 64 temporary staff. The port operation department represents 84.9% of the positions, of which 31.4% is for the container terminal and 14.9% for the bulk and break bulk division.

Namport has a training policy on capacity building. Based on the policy, Namport has dispatched 10 staff members every two years to Rotterdam or called a trainee from Pakistan for training of staff. Finland is also conducting two projects (NARINAM project and MARIBIA project) to support maritime sector of Namibia during 2012 and 2015.

**Table 6.24: Number of staffs/employees as of April 2014**

Departments/Divisions		No of staffs/employees			Share in staffs/employees
		Permanent	Temporary	Total	
Office of CEO		9	0	9	
Operation	Container Terminal	267	1	268	31%
	Bulk and Break Bulk Division	88	39	127	15%
	Marine	96	0	96	
	Technical Division	103	0	103	12%
	Syncrolift Division	30	0	30	
	Port of Lüderitz	76	24	100	12%
Sub-total		660	64	724	85%
Port Engineering		29	0	29	
Finance		32	0	32	
Human Resource		13	0	13	
Marketing		11	0	11	
Project		5	0	5	
SHREQ		30	0	30	
Total		789	64	853	

Source: Interview with Namport officials

### 6.3.2 Duties and functions of Namport

According to the Namibian Ports Authority Act, general duties of Namport are to:

- Manage and exercise control over the operation of ports and lighthouses and other navigational aids in Namibia and its territorial waters, and

- Provide facilities and services normally related to the functioning of a port.

The following functions of Namport are described in Namibian Port Authority Act as well. These are to:

- Undertake the berthing and dry-docking of ships,
- Undertake the storing, warehousing, sorting, weighing, loading, off-loading, lighterage and handling of goods and the embarking or disembarking of passengers on to or from ships within the Authority's area of jurisdiction,
- Operate, or construct and operate, lighthouses, and to provide and maintain other aids to navigation, whether within a port or within the territorial waters of Namibia or along the coast of Namibia,
- Provide and maintain surveillance aids and other equipment to monitor the movement of ships,
- Provide and maintain lifeboats and other lifesaving equipment,
- Provide and maintain search and rescue services,
- Undertake dredging services in ports and channels and approaches thereto,
- Provide tug and pilotage services, and
- Protect the environment within its area of jurisdiction.

### 6.3.3 Financial situation of Namport

Table 6.25 indicates financial indicators of Namport from 2006/07 to 2011/12. Financial condition of Namport is good during the period. Turnover and operating profit has been increasing steadily during the period. Return on assets and return on equity recorded 9% and 15% in recent years.

**Table 6.25: Final indicators of Namport**

Unit: N\$ 000

Financial indicators	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Turnover	324,237	434,213	615,819	566,025	646,792	755,163
Operating profit	92,803	140,165	264,303	165,851	202,623	194,203
Profit before taxation	113,873	164,658	290,032	192,679	231,817	254,996
Return on assets	9%	11%	14%	8.4%	8.9%	8.9%
Return on equity	13%	17%	24%	14%	15%	15%
Operating profit margin	29%	32%	43%	29%	31%	26%
Total assets	1,296,726	1,502,981	2,031,006	2,287,723	2,605,919	2,878,856
Shareholder's interest	865,403	963,528	1,221,285	1,350,700	1,499,722	1,696,642
Long-term borrowings	231,478	220,549	367,534	466,958	514,097	364,089
Debt equity ratio	0.27	0.23	0.31	0.35	0.34	0.21
Current ratio	3.29	2.07	3.69	3.43	3.14	1.98
Debt-service coverage ratio	1.97	2.05	3.1	4.9	2.8	3.5
Training as % of payroll	5%	4%	3%	2%	5%	4%
Number of employee	606	576	601	611	692	825
Turnover per employee	535	754	1,025	926	935	915
Assets per employee	2,140	2,609	3,241	3,744	3,766	3,490

Source: Namport Annual Report 2012

### 6.3.4 Walvis Bay Port

Walvis Bay Port is located in the city of Walvis Bay of which the population is about 79,500 in 2012. It is 360 kilometres by road from Windhoek, the capital city of Namibia. A good asphalt road (B1 and B2) links Walvis Bay to the Namibian corridors; the Trans–Kalahari Corridor to Johannesburg and Pretoria in South Africa via Gaborone in Botswana, the WNLDC to southern Zambia and DRC, the Trans–Cunene Corridor to southern Angola up to Lubango, and Trans–Orange Corridor to Johannesburg and Pretoria in South Africa via Windhoek and Keetmanshoop.



Source: Namport

**Photo 6.1: Syncrolift, oil jetty, floating docks and container terminal (berths nos. 1 to 3)**

Walvis Bay Port is developed in a bay that is naturally protected by a peninsula, the northern extremity being Pelican point where a lighthouse has been built.

There are two separate access channels from the open sea to the port facilities; one for the fishing port and the other for the commercial port. The access channel to the commercial port is 9 kilometres long and 134 metres wide. It used to be 6.2 kilometres long and 10.6 metres deep and was lengthened when deepened to 12.8 metres in 2000 and to 14.4 metres in 2010/11 (deepening works completed in June 2011). Following this deepening works, the typical size of the largest vessels that are presently able to enter the port without restriction is as follows:

- Panamax container vessels: capacity of less than 4,500 TEUs, tonnage of less than 60,000 GT (gross ton), draught less than 13.5 metres, length less than 300 metres, width 40 metres.
- Panamax bulk carriers: tonnage less than 60,000 GT, draft less than 13.5 metres, length less than 220metres.

The port provides piloting, tug and berthing services. At present, loading/unloading to/from a vessel

is being carried out 24 hours a day by a two-shift system. However, Namport plans to change from the present two-shift to a three-shift system to improve working conditions (especially reduction of overtime) of employees.

Namport has plans for expansion of two ports. Namport will need more staff when these plans come to reality. Namport is going to employ skilled staff from abroad to deal with the increased work volume.



Source: JICA Study Team

**Photo 6.2: Walvis Bay Port: main gate (left) and railway yard (right)**

#### 6.3.4.1 Cargo handling volume

As indicated in Table 6.26, cargo throughputs are increasing steadily. The recorded annual throughputs for 2011/12 and 2012/13 were 6.2 million tons and 6.1 million tons respectively. This exceeds the combined current capacity of the existing bulk terminals that is 5.9 million tons per annum.

**Table 6.26: Cargo handling volume at Walvis Bay Port**

Year	2006/07	07/08	08/09	09/10	10/11	11/12	12/13*
Landed	2,298,927	2,702,419	2,994,258	2,638,184	2,946,311	3,218,846	3,273,046
Shipped	1,156,899	1,251,316	1,219,750	1,239,511	1,372,240	1,455,898	1,563,282
Transhipped	507,304	439,001	824,044	1,023,476	871,886	1,535,541	1,297,532
Total	3,963,130	4,392,736	5,038,052	4,901,170	5,190,437	6,210,285	6,133,860

Note: \* Interview with Namport officials

Source: Namport Annual Report 2012

The design capacity of the existing container terminal has increased from of 250,000 TEUs per annum to a current capacity of 350,000 TEUs per annum.

It can be seen from data that the container terminal is operating near full capacity at 96% and 86% utilization (334,410 TEUs handled in 2011/2012 and 301,817 TEUs in 2012/2013) for the last two financial years respectively.

Of the total containers handled, 65% are transhipped whilst the remaining 35% of the containers is transported through the land corridors.

Forecasted trends by Namport suggest that it will be necessary to accommodate a total of 1,000,000



TEUs by 2025.

**Table 6.27: Container handling volume at Walvis Bay Port**

Year	2006/07	07/08	08/09	09/10	10/11	11/12	12/13*
Landed	26,295	35,669	47,550	46,746	51,721	66,190	70,987
Shipped	26,728	29,892	48,547	44,879	41,734	50,634	60,492
Transhipped	91,970	105,025	154,165	156,118	126,723	217,586	170,338
Total	144,993	170,586	250,262	247,743	220,178	334,410	301,817

Unit: TEUs

Note: \* Interview with Namport officials  
Source: Namport Annual Report 2012

Over the last few years, on average around 1,600 vessels visited Walvis Bay Port annually as indicated in Table 6.28. In 2011/12 1,625 vessels called and in 2012/2013 1,541.

**Table 6.28: Number of vessels calling at Walvis Bay Port**

Year	2006/07	07/08	08/09	09/10	10/11	11/12	12/13*1
No of vessels	1,216	1,251	1,601	1,641	1,585	1,625	1,541

Note: \* Interview with Namport officials  
Source: Namport Annual Report 2012

### 6.3.4.2 Facilities managed by Namport

Table 6.29 shows facilities managed by Namport. There is no Container Freight Station (CFS) where containers are to be stuffed/unstuffed. There are two scanners in the port for scanning containers. Scanned containers are chosen randomly, except for suspicious ones that are all scanned.

During the last eight years, significant areas of land (around 8 hectares) have been given to neighbouring countries (Zimbabwe, Zambia and Botswana) by the Namibian Government to develop dry port facilities behind the dry bulk terminal for transit traffic travelling along the Namibian transport corridors (Trans-Kalahari, Trans-Cunene, WLND). The Zimbabwean and Zambian dry ports are entirely in the port public domain, whilst the dry port of Botswana is mainly in the railway domain. Whilst Zambia and Botswana has started operation of the dry ports, Zimbabwe has not as of January 2015.

**Table 6.29: Facilities in Walvis Bay Port**

Facility	Area (ha)	Quay (m)	Berths
Container terminal	14.14	500	1, 2, 3 (max. water depth of 14.0m chart datum)
Bulk terminal	17.85	350	4, 5, 6, 7, 8 (max. water depth of 14.0m chart datum)
Break bulk terminal			
Salt terminal	1.62		Share 3
Rail hub (TransNamib)	3.65		
Cold storage facility	1.50	350	
Ro-Ro car park	5.50		Share 6
Liquid bulk storage	7.40	220	
Dry port*1	8.02		
Other incl. scanners, ship repair jetty	18.32	1,020	
Total	78.00		

Note: \*1 Zambia 2.7ha, Botswana 3.42ha and Zimbabwe 1.9ha (Interview with Namport officials)  
Source: Walvis Bay North Port Pre-Feasibility Study, by ARUP, 21 May 2013



Container Terminal



Salt Terminal



Zambian Dry Port in the port

Source: JICA Study Team



Bonded Warehouse

**Photo 6.3: Facilities of Walvis Bay Port**

### 6.3.4.3 Equipment

Namport operates 197 machines and vehicles for cargo handling at Walvis Bay Port. Table 6.30 shows type, specification and number of equipment in Walvis Bay Port.

According to Namport, however, not all of the 140-ton mobile harbour cranes (3 cranes) could work because of aging deterioration in 2012/13. Therefore, throughput of cargo and containers decreased to 6,133,860 tons and 301,817 TEUs in 2012/13 from 6,210,285 tons and 334,410 TEUs in 2011/12. Namport has already purchased 3 new cranes.

**Table 6.30: Type and number of equipment in Walvis Bay Port**

Type	Specification	No.	Type	Specification	No.
Mobile harbour crane	104 ton	4	MHC spreader	51 ton	7
	140 ton	3		41 ton	4
	84 ton	1	RTG spreader	51 ton	8
Reach stacker	45 ton	15	MMHC grab	18 ton	1
Empty handler	9 ton	2		16 ton	1
Forklift	4 ton	23	Wharf crane	4 ton	7
	16 ton	2	Front end loader		2
	45 ton	1	Tractor		2
Hauler	75 ton	54	RTG's	51 ton	6
Container trailer	60 ton	49			
	40 ton	5	Total		197

Source: Namport Annual Report 2012

### 6.3.4.4 Maritime services in Walvis Bay

The main shipping companies having container services calling at Walvis Bay are presently Maersk

and CMA CGM. Maersk is the largest shipping line in the world and CMA CGM is the third largest shipping line. MOL, a Japanese shipping line and MSC, the second largest line, have container services as well. In addition to these lines, there are a few regional operators such as MACS. These shipping lines are only involved in maritime transport business and are not involved in the land transport services.

**Table 6.31: Business activities of shipping companies at Walvis Bay Port**

Shipping company	Service at Walvis Bay Port
MAERSK	Service between the Far East and Southern and Western Africa. <ul style="list-style-type: none"> <li>- The ports of call in Western Africa are Walvis Bay, Apapa (Nigeria) and Tema (Ghana).</li> <li>- One of main activity in Walvis Bay is transshipment of containers to / from Angola (Luanda).</li> <li>- Weekly container service by capacity up to 4,500 TEUs ship</li> </ul>
	Service between Europe and western and southern Africa <ul style="list-style-type: none"> <li>- The port of call in Luanda</li> <li>- Weekly container service</li> <li>- Capacity of 1,000 to 1,500 TEUs ship</li> </ul>
CMA CGM	Far East service <ul style="list-style-type: none"> <li>- Direct from Asia to Walvis Bay with no port of call in South Africa, 23 days travel time between Asia and Walvis Bay</li> <li>- Weekly container service by 4,000 TEUs capacity ship</li> </ul>
	Middle East service <ul style="list-style-type: none"> <li>- Sailing directly to Walvis Bay and calls in Luanda from Jebel Hali in Dubai, 17 days travel time between Jebel Hali and Walvis Bay</li> <li>- Weekly container service by capacity of 3,000 TEUs ship</li> </ul>
	Western Africa feeder service <ul style="list-style-type: none"> <li>- From Walvis Bay to a number of western Africa ports</li> <li>- Weekly container service by 500 TEUs capacity ship</li> </ul>
MSC	<ul style="list-style-type: none"> <li>- Service is Angolan Feeder and IO.</li> <li>- Every 8 or 9 days by 1,100 TEU capacity ship</li> </ul>
MOL	<ul style="list-style-type: none"> <li>- Container activities in Africa are much smaller than the 3 above.</li> <li>- A bi-weekly feeder service between South Africa and Angola</li> <li>- Bi-weekly by capacity of 850 TEU ship</li> </ul>
MACS	<ul style="list-style-type: none"> <li>- Between Europe and Western Africa</li> <li>- Between North America – Gulf of Mexico – Walvis Bay and South Africa</li> <li>- 1,900 TEUs capacity mixed ship</li> </ul>

Source: Namibia Integrated Transport Master Plan

### 6.3.5 Lüderitz Port

Lüderitz Port is located 340 kilometres from Keetmanshoop, the capital city of Karas Region. There is a good asphalt road (B4) linking Lüderitz to the Namibian corridors; Trans–Orange Corridor to Johannesburg and Pretoria in South Africa via Keetmanshoop.

#### 6.3.5.1 Cargo handling volume

Table 6.32 indicates the cargo handling volume at Lüderitz Port from 2006/07 to 2012/13. The annual throughputs in 2011/12 and 2012/13 were 311,920 tons and 372,968 tons, respectively. The major businesses operating out of Lüderitz Port revolve the mining and fishing industries. The mining sector exports large volumes of zinc annually and imports sulphur, while the export volume of the fishing sector is increasing steadily.

**Table 6.32: Cargo handling volume at Lüderitz Port**

Year	Unit: tons						
	2006/07	07/08	08/09	09/10	10/11	11/12	12/13*
Landed	107,285	128,059	126,629	140,082	129,526	129,635	167,942
Shipped	166,035	169,516	219,200	207,729	210,805	182,285	204,126
Transhipped	30	29	0	0	0	0	0
Total	273,350	297,604	345,829	347,811	340,331	311,920	372,068

Note: \* Interview with Namport officials

Source: Namport Annual Report 2012

Table 6.33 indicates the container handling volume at Lüderitz Port. The container terminal was handling 2,724 TEUs in 2011/12 and 2,992 TEUs in 2012/13, respectively.

**Table 6.33: Container handling volume at Lüderitz Port**

Year	Unit: TEUs						
	2006/07	07/08	08/09	09/10	10/11	11/12	12/13*
Landed	1,868	6,393	7,908	4,663	4,436	1,324	1,460
Shipped	1,373	6,626	7,493	3,913	4,140	1,400	1,532
Transhipped	-	-	-	-	-	-	-
Total	3,241	13,019	15,401	8,576	8,576	2,724	2,992

Note: \*1Interview with Namport officials

Source: Namport Annual Report 2012

The number of vessels calling at Lüderitz Port decreased gradually. In 2007/08, 1,258 vessels called at Lüderitz Port, however, the number decreased to 823 in 2012/13.

**Table 6.34: Number of vessels calling Lüderitz Port**

Year	2006/07	07/08	08/09	09/10	10/11	11/12	12/13*
No of Vessels	1,168	1,258	1,115	918	1,021	940	823

Note: \*1Interview with Namport officials

Source: Namport Annual Report 2012

### 6.3.5.2 Port facilities

The new quay for cargo was built in 2000. It is a 300 metres long concrete block gravity quay wall. The depth at berth is 8.75 metres. The depth in the access channel is only 8.15 metres. Vessels with draught up to 7.25 metres can enter the port whatever the tide is. The maximum draught of vessels entering the port is 8.5 metres at high tide (minimum tidal variation: 0.2 metres, maximum 1.65 metres). The maximum length of vessel entering the port is 165 metres, although vessels with a 200 metres-length sometimes call at Lüderitz. The maximum size bulk carriers which can call at Lüderitz fully loaded are small Handy-size with a capacity of 16,000 tons. Handy-max bulk carriers (capacity up to 50,000 tons) can enter the port only partially loaded. The maximum capacity of cellular container vessels entering the port is limited to under-panamax feeder vessels with a capacity of 800 to 1,000 TEUs.

The platform behind the new quay is concrete paved and fenced. There are 70 plugs for reefer containers near the entrance of the port.

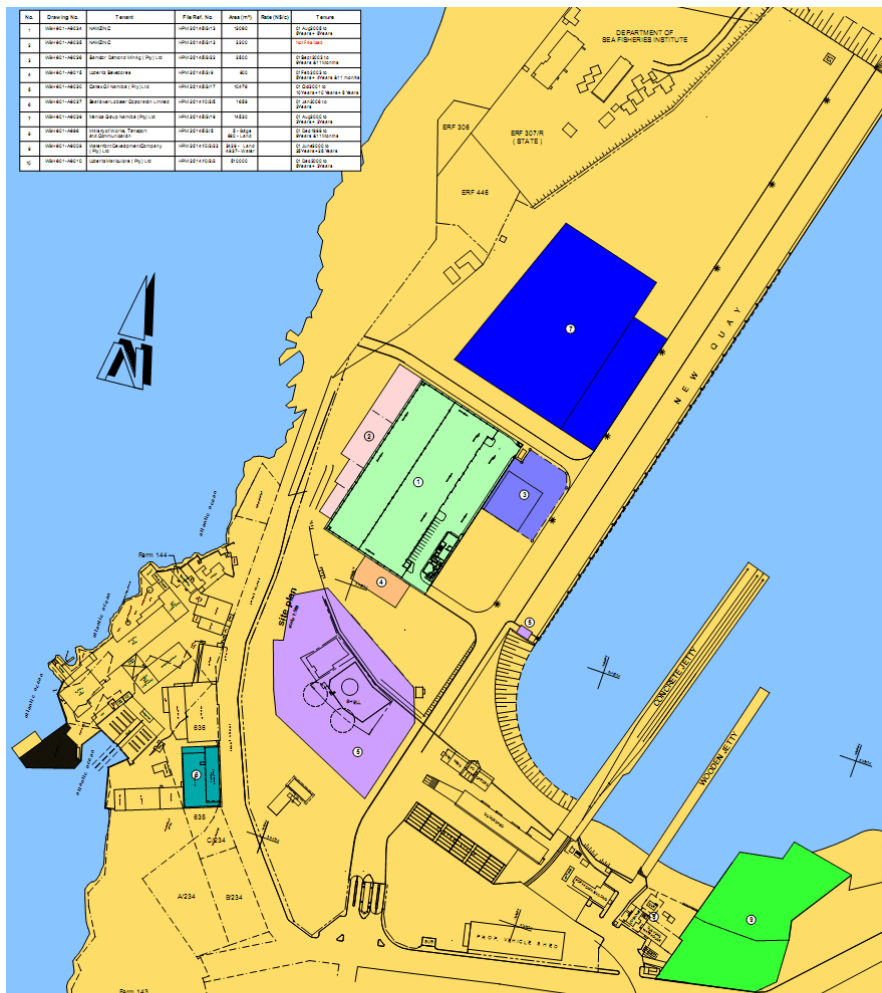
There used to be rail spurs within the port but they have been dismantled. Reconstruction of the railway between Aus and Lüderitz town has already been completed in November 2014, and the

railway will be reconnected to the port within 2015.



Source: JICA Study Team

**Photo 6.4: Facilities in Lüderitz Port: quay for cargo (left) and container yard (right)**



Source: Namibia Integrated Transport Master Plan

**Figure 6.7: Existing port facilities at Lüderitz Port**

The current quayside facilities at Port of Lüderitz are summarized Table 6.35. Access to the port from the open ocean is via a 708 metres long and 60.9 metres wide entrance channel.

**Table 6.35: List of port facilities at Lüderitz Port**

Port Facilities	Description
Cargo and Container Quay	<ul style="list-style-type: none"> <li>- Caters for vessels up to 150m in length with a draught not exceeding 8.15m</li> <li>- Mainly used for the handling of cargo vessels of all types.</li> <li>- Also used by fish trawlers when cargo vessels do not occupy the space.</li> <li>- Due to insufficient working space at the concrete jetty, offshore-supply vessels are also berthed.</li> </ul>
Container Jetty	<ul style="list-style-type: none"> <li>- Mainly used to service fishing vessels, particularly those landing fish for processing in the factories.</li> <li>- Maximum ship length allowed is 150m or a maximum ship displacement of 5 000 tons.</li> <li>- Typical vessels are fishing vessels, small reefer ships and offshore diamond vessels.</li> </ul>
Wooden Jetty	<ul style="list-style-type: none"> <li>- Used by smaller craft and is not suitable for cargo handling and heavy loads.</li> <li>- Mainly used for lay-up and maintenance purposes</li> </ul>

Source: Diagnostic and Scoping Survey for the Namibia Spatial Development Initiatives Program Draft Corridor Master Plan, aurecon, March 2014

### 6.3.5.3 Equipment

Table 6.36 shows type, specification and number of equipment in Lüderitz Port. Namport owns 21 machines and vehicles for handling cargo in Lüderitz Port as of 2012.

**Table 6.36: Type and number of equipment in Lüderitz Port**

Type	Specification	No.	Type	Specification	No.
Mobile Harbour Crane	64 ton	1	Container Trailer	60 ton	2
	25 ton	2		40 ton	2
Reach Stacker	45 ton	2	Tractor		4
Forklift	4 ton	2	Iveco Horses		2
	45 ton	1			
	7 ton	1			
Hauler	75 ton	2	Total		21

Source: Namport Annual Report 2012

## 6.3.6 Existing plans and on-going projects

### 6.3.6.1 Walvis Bay Port

Although the Walvis Bay Container Terminal has increased the annual container handling capacity from 250,000 to more than 300,000 TEUs (berths 1, 2 and 3) in recent years, the forecast demand in container throughputs shows that this increase is insufficient to accommodate the immediate demand. Therefore, Namport has two on-going plans for expansion of cargo handling volume at Walvis Bay in the future as follows:

- New Container Terminal as an expansion of the existing Port of Walvis Bay, and
- North Port Development, a new port development.

The New Container Terminal project is to increase the port's container terminal capacity from 350,000 to 750,000 TEUs by 2018 and the port's bulk handling facility from 5.9 million tons per annum to 7.2 million tons per annum by 2018.

The aim of the North Port Development project is to build a completely new port to accommodate the

additional demand that is forecast to exceed 1 million TEUs by 2050.

### **New container terminal**

Namport has already undertaken the construction of a new container terminal. The outline of the new container terminal is as follows.

- 40 hectares of new land to be used for construction of a modern container terminal
- 600 metres of additional quay length at 16.0m below chart datum at the new terminal
- Two large berths for accommodating two container ships at once
- Installation of 4 x super-post panamax ship to shore quay cranes
- 750,000 TEUs per annum capacity at the new terminal
- Connection to the existing port's road network, rail network, utilities networks
- Provision of a new administration building, access gate, substations and mechanical workshop
- Construction of a jetty for small craft on the one side and up to 8,000dwt passenger liners on the other side
- The construction cost is estimated to be N\$3.44 billion

The tender documents for the construction of this new container terminal have been evaluated and China Harbour Construction Company was selected. The ground breaking ceremony was held on 9 May 2014. The construction work is expected to be completed in 36 months.

According to "Port of Walvis Bay Infrastructure Development Master Plan (Draft)" prepared by Namport, the expected container handling capacity (750,000 TEUs) of the new container terminal will be insufficient after 2023. Therefore, Namport strongly considers producing additional container handling capacity by 2023. Some of the options for creating more container throughput capacity are as follows:

- Extending the new container terminal with phase 2,
- Modification and utilisation of the existing berths 1 to 3 for containers again,
- Modification and utilisation of berths 4 to 8 for containers, and
- A new container terminal at the Port of Walvis Bay SADC Gateway (the North Port).





Source: NamPort

**Figure 6.8: Layout Plan of the new facility at Walvis Bay Port**

### **Development of North Port**

According to Namport, the development of North Port is necessary for the following reasons.

- Namibia needs a deep-water seaport at Walvis Bay with sufficient bulk handling capacity to cater for demand of export of mining related cargo such as coal and iron ore.
- The present port's liquid bulk handling facility is too old and small to cater for the huge demand for fuel from SADC countries.
- A bulk cargo handling terminal needs a vast area of land. The present Walvis Bay Port cannot accommodate large-scale bulk and break bulk cargo volumes.
- The present Walvis Bay Port cannot accommodate the oil exploration and drilling industry's requirement.
- The present port capacity to accommodate large-scale ship and rig repair operations is limited due to space constraints.
- The present Walvis Bay Port is surrounded by the lagoon. Therefore, the port has no space to expand.

For these reasons Namport implemented the feasibility study for the construction of the North Port just north of the current built-up area in Walvis Bay.

Table 6.37 and Table 6.38 show projections of additional throughput for Walvis Bay Port to the year

2050 and a summary of general features of the North Port. The largest single factor in favour of the North Port Development is the fact that the potential for Walvis Bay to become a gateway to export coal from Botswana is assumed to be higher than in the past. The expected quantity of coal to go through Walvis Bay could be tremendous (average 24 million tons per year, at its peak 100 million tons per year). The construction of a new container terminal has already commenced to enable increased container and cargo volumes. Namport however assumes that additional capacity to handle cargo and containers is necessary when it is required to accommodate coal from Botswana and increased demand for container handling in the longer-term. Therefore, planning for “Development of North Port” has started.

**Table 6.37: Summary of additional throughput of Walvis Bay Port up to 2050**

Development	Terminal	Description	Throughput per year	Year
Sustained growth aligned with GDP	Container	Regional container transshipment hub for trade to central and southern Africa.	Additional throughput: Import 87,000TEUs, Export 44,000 TEUs, and Tranship 843,000 TEUs (Total 974,000 TEUs)	2050
	Bulk	Cargo mix including Ro-Ro, general, dry, liquid and other	5.87 million tons	2050
Namport’s aspiration	Ship & rig repair	N/A	N/A	TBD
	Fishing wharves	N/A	N/A	TBD
	Dry port logistics base	N/A	N/A	TBD
External Infrastructure ‘Mega – Development’	Bulk	WBILH Private Dry Port linking logistics zone east of Dune 7	1 million tons	TBD
		Botswana Mmamabula Coalfields	24 million tons in average for export (100 million ton peak export)	Until 2020
		Iron Ore from Opuwo	5 million tons for export	2016
		Uranium from Namibia	23,500 tons for export	2015
		Gecko Vision Industrial Park	2,800,000 tons for import 2,670,000 tons for export Totals 5.5 million tons	TBD
		Nampower Arandis Power Plant	1.1 million tons in average for 300MW 2.7 million tons in peak for 800MW	2016 TBD
	Oil & Gas	Namcor Petroleum Jetty	0.38 million tons in lower scenario 0.80 million tons in upper scenario	Asap
		Gecko Vision Industrial Park	1.48 million tons	TBD

Source: Walvis Bay North Port Pre-Feasibility Study, by ARUP, 21 May 2013

**Table 6.38: General features of North Port**

General Features of North Port
<ul style="list-style-type: none"> <li>- Total of 1,330ha of North Port development area</li> <li>- 10,000m of quay wall and jetties to yield approximately 30 large berths</li> <li>- World class ship and rig repair yard and oil and gas supply base</li> <li>- Huge dry bulk terminal (&gt; 100 million tons per annum)</li> <li>- Car import terminal / Ro-Ro terminal</li> <li>- Passenger terminals</li> <li>- Container terminals (if needed in future)</li> <li>- Liquid bulk terminal with VLCC berths</li> <li>- Multipurpose and break bulk terminals</li> <li>- Backup storage areas / dry ports</li> <li>- Small craft harbour with port control tower</li> <li>- Small boat marinas, and</li> <li>- New high capacity rail, road, pipeline and conveyor link to the municipal heavy industrial area behind dune 7</li> </ul>

Source: Port of Walvis Bay SADC Gateway – Development Project Overview, 21 May 2014

It is recommended that the early phases of the port development should focus on ‘early wins’ by developing facilities that will create revenue streams and to understand these aspirations in regard to both the ultimate layout of the port and also the construction methodology and phasing.

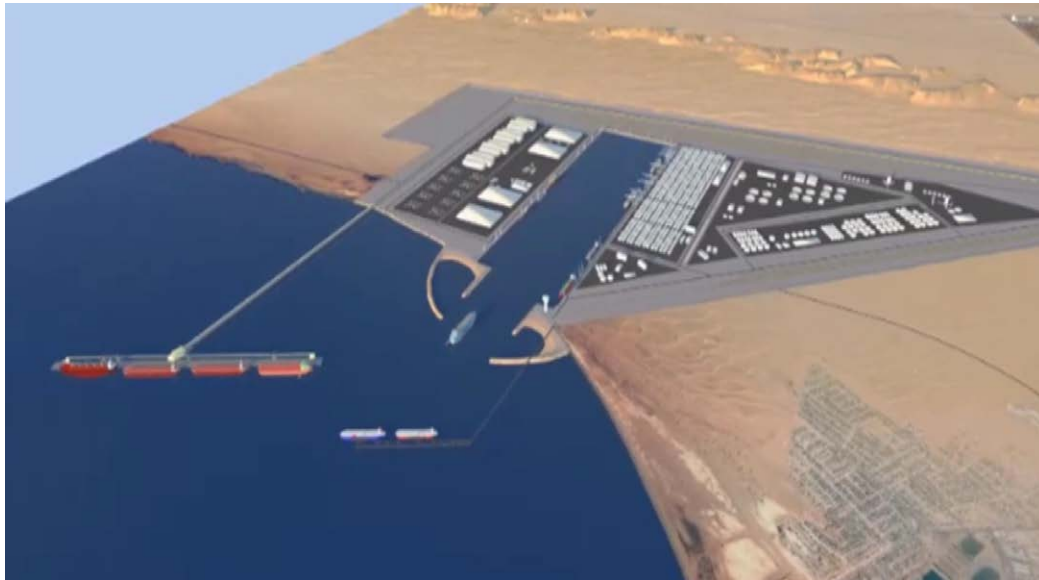
Namport anticipates making all major investments in nautical infrastructure (dredging of an entrance channel and a turning basin to the new port) as well as all major quay walls and jetties. However, all superstructures such as cargo handling equipment, terminal pavements, buildings and other terminal infrastructure will be built and operated by the individual private terminal operators / concessionaires. Therefore, Namport will be the landlord and all terminal operations will be outsourced to private operators. The only exception to this could be the container terminal in which Namport is currently also the operator in the existing port of Walvis Bay. The project has been split into several phases as indicated in Table 6.39.

**Table 6.39: Proposed terminal phasing**

Phase	Construction of terminal	Contents
1	Liquid Bulk Terminal	<ul style="list-style-type: none"> <li>- Entrance channel and turning basin to new port</li> <li>- 2 x 60,000dwt tanker berths</li> <li>- Access trestle</li> <li>- Product pipelines</li> </ul>
	Contractor for Phase 1 has already been awarded and is expected to start by January 2015. The terminal will be operated early 2017.	
2	Multipurpose Bulk Terminal (<10 million tons p/a)	<ul style="list-style-type: none"> <li>- Construction of an offshore berth similar to the liquid bulk berths for export of dry bulk cargo such as iron ore, manganese, coal, etc, most of which are Namibian mining products for export</li> <li>- Feasibility study will be commenced early 2015.</li> <li>- Construction will be started in 2016.</li> <li>- The terminal is expected to start operation by 2018/2019.</li> </ul>
3	Botswana Coal Terminal (100 million tons p/a)	<ul style="list-style-type: none"> <li>- Construction of at least 5 x offshore berths which will be dedicated for export of coal from the Botswana coal fields.</li> <li>- It is dependent on Trans Kalahari Railway development. (The governments of Namibia and Botswana agreed on BOT of TKR by private sector on 19 March 2014.)</li> <li>- It will be completed by 2022.</li> </ul>
After 4	The Dig Out Basin	<ul style="list-style-type: none"> <li>- Digging out of the port basin into the land</li> <li>- Still in the conceptual phase and no time schedule for implementation</li> </ul>

Source: Namport Mega Projects Overview, 15 October 2014

According to Namport, phase 1 of the project is being implemented by the Ministry of Mines and Energy. The contractor for Phase 1 has already been appointed and is expected to start by January 2015. The terminal will be operational by early 2017.



Source: Namport Mega Projects Overview, 15 October 2014

**Figure 6.9: Overview of North Port**

### 6.3.6.2 Lüderitz Port

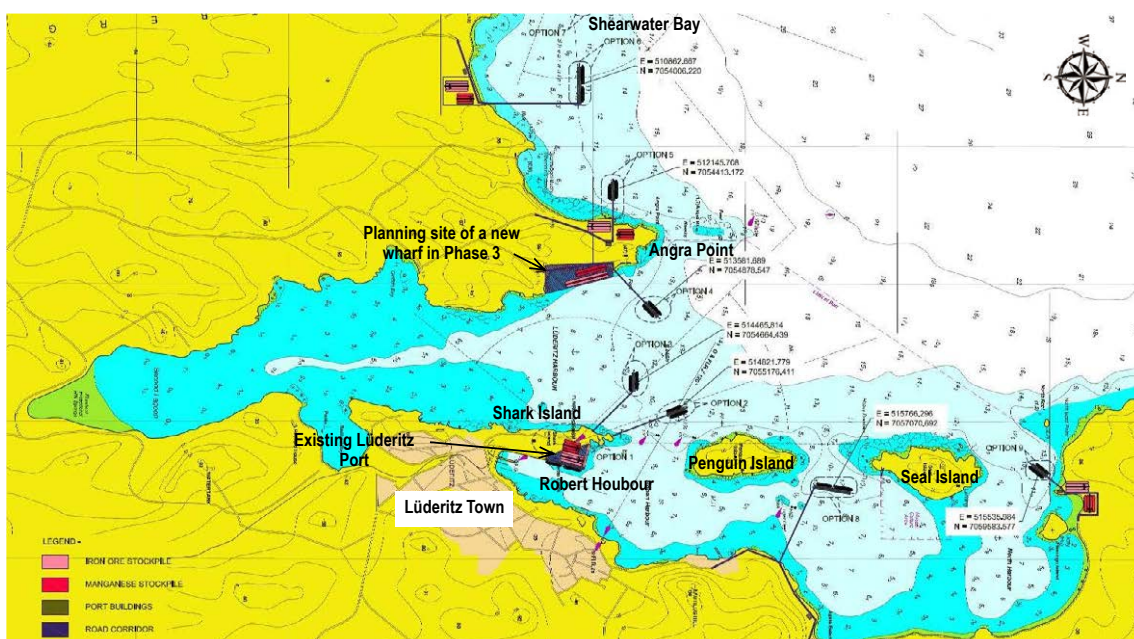
The previous feasibility study for Lüderitz Port involved 3 phased approaches that aimed to optimize the existing port infrastructure with minimal investment.

According to Namport, phase 1 has already been completed. Construction of railway access to the port (inside the port) from Aus railway station was already completed up to Lüderitz Town in November 2014. The remaining part of the railway line (the railway station to the inside of the port) will be finished by 2015. Namport also conducted a pre-feasibility study (comparative analysis of new wharf and jetty) for Phase 3 as shown in Figure 6.10.

**Table 6.40: Improvement plan of Lüderitz Port**

Phase	Outline of a Plan
Phase 1	Improvement of cold storage, container/reefer, and stuffing and de-stuffing facilities.
Phase 2	<ul style="list-style-type: none"> <li>- Completion of the railway access to the existing port allowing for a ramp-up in the throughputs.</li> <li>- Part of the ramp-up involves the transshipment of 1 million tons of manganese a year, via barges to a larger vessels anchored in deeper waters.</li> <li>- The remaining commodities would still operate out of the main harbour.</li> </ul>
Phase 3	<ul style="list-style-type: none"> <li>- Greenfield bulk terminal at Shearwater Bay or Angra Point.</li> <li>- The bulk terminal would cater for the possible export of iron ore and manganese from Lüderitz.</li> <li>- The existing port would cater primarily for containers/reefers, general cargo and passenger vessels.</li> </ul>

Source: Diagnostic and Scoping Survey for the Namibia Spatial Development Initiatives Program Draft Corridor Master Plan, aurecon, March 2014



Source: NAMPORT MEGAPROJECTS OVERVIEW, 15 October 2014 (presentation material); edited by JICA Study Team

**Figure 6.10: Comparative analysis of future port facility of Lüderitz Port**

### 6.3.6.3 Other new port development projects

A pre-feasibility study was carried out for the construction of a new port between Cape Fria and Angra Fria in 2008. In August 2012 MWT launched an invitation to tender for consultants' services for the preparation of a full feasibility study of a "Northern port" including field surveys (bathymetric, topography, geotechnical surveys). The scope of work is no more limited to the Cape Fria – Angra Fria area but covers the entire area from Angra Fria in the north, to Möwe Bay in the south, about 150 km south from Angra Fria (and about 450 km north of Walvis Bay).

The intention of GRN that conducted the prefeasibility-study was that the new port should be essentially a mineral port for the traffic generated by mines likely to be opened in the future in north-western Namibia (Kunene Region) where important deposits have been discovered (iron ore, etc.).

The result of the feasibility study was that this new port should not compete with Walvis Bay. Namibia and neighbouring countries do not generate enough traffic to justify two major multi-purpose ports in Namibia and if the new port is developed in order to attract traffic presently passing via Walvis Bay, it will "kill" Walvis Bay, which would not be a sound policy.

### 6.3.7 Issues on port development

A port is one of the most vital facilities that can transform Namibia to an international logistics hub. It should be understood that it is very important to increase the handling capacity not only of

transshipment cargo that does not go out from the port area but also of the cargo that does go out from the port including transit cargo to/from neighbouring countries.

In this context, it is necessary to pay more attention to existing conditions of the hinterland of an existing port as well as cargo transportation mode to/from an existing port for the smooth and safe transport of cargo.

From these points of view, bottlenecks of both ports are summarized below.

#### **Walvis Bay Port**

- The depth of the existing entrance channel is 14.4 metres. It is suitable for a container vessel of 4,500 TEUs. However, it is not suitable for post Panamax (5,000 TEUs) and larger vessels. 16.0 Metres depth or more is necessary.
- Creation of additional container handling capacity before 2023 will be necessary because the expected container handling capacity (750,000 TEUs) of the new container terminal will not be sufficient by 2023.
- The close proximity of residential areas along the landward perimeter of the port restricts the expansion of the storage areas for the container and bulk terminals.
- The route for heavy vehicles in the road network in the existing urban area and peripheral area is unclear.
- Improvement and/or upgrading schedule of transport infrastructure, especially the port, roads and railway within corridors is not well coordinated.

#### **Lüderitz Port**

- The shallow depth of the existing navigation channel (8.15 metres) and inner harbour basin.
- The lack of an efficient hinterland connection negatively impacts on the potential for increasing the throughput capacity of Lüderitz port. The Port requires completion of the railway reconstruction work from the port to Lüderitz Town.

### **6.4 Road network development in Namibia**

A series of meetings were held with the Road Authority (RA) for discussion on RA's activities, projects that are being implemented and planned in NDP4 period, and for collecting statistical data and information.

The following 5 institutional arrangements existed in the road sector in Namibia at independence in 1990.

- Roads were fully financed by way of taxes, and priorities were therefore ultimately decided on by political considerations.

- A department of the government administration managed the roads (i.e. the Department of Transport (DOT) in the Ministry of Works, Transport and Communication (MWTC)).
- Force account units managed by the DOT carried out a substantial part of the works, in particular routine maintenance.
- Private contractors by way of competitive tendering performed most construction and periodic maintenance works.
- Private consultants performed a substantial portion of the preparation of documentation for and supervision of the construction and periodic maintenance works (recruited by direct contracting when funded by the State Revenue Fund and competitive bidding when co-funded by donors). Such consultants were also used for the preparation of long-term plans for the development of the road network.

GRN decided on a road sector reform in 1995 based on following two basic principles.

- Costs associated to economically justifiable road projects (maintenance, rehabilitation and development) are funded through a “Road User Charge” (RUC) system channelled into a dedicated Road Fund (RF).
- Road works (maintenance and development) are contracted out through competitive bidding.

On 1<sup>st</sup> April 2000, this reform resulted in the creation of three state owned enterprises – the Roads Authority (RA), Road Fund Administration (RFA), and Road Contractor Company (RCC).

#### **6.4.1 Organization**

There are three state owned enterprises related to road development, namely:

- **Roads Authority (RA)**, which was established by the Road Authority Act, 1999 (Act 17, 1999) to manage the national road network.
- **Road Fund Administration (RFA)**, which was established by the Road Fund Act, 1999 (Act 18, 1999) to manage the RUCs which are channelled into a dedicated Road Fund (RF).
- **Road Contractor Company (RCC)**, which competes with other private sector companies for road construction, maintenance and rehabilitation contracts.

Activities of RA and RCC are controlled by MWT, which has overall responsibility for transport policy and regulation. After the reform, MWT is no longer directly involved in road construction but establishes, approves and finances road development programs, as far as non-economically justifiable projects are concerned.



RFA's financial and management performance are overseen by the Ministry of Finance (MOF) which is also responsible for controlling parliamentary appropriations which are budgeted on the budget of MWT and deposited in the RFA as a transfer payment.

RA's functions are:

- Planning and design (which is eventually contracted out to consulting firms),
- Quality control of materials and supervision of construction and maintenance works (which are contracted out),
- Operation of a Road Management System (RMS) aimed at monitoring the condition of the road network and providing tools for planning and programming road maintenance,
- Prevention of excessive damage to roads through overload control, and
- Other functions assigned by the Minister of MWT.

RFA has the following objectives to manage the RUC system.

- Determining funding requirements for projects and programs approved by the RFA for funding,
- Determining rates of RUC, and
- Collecting RUC into the RF.

RUC consists of fuel levies, license and registration fees, abnormal load fees, cross border charges, mass distance charges, overload charges and other charges.

RCC absorbed most of the previous force account units of MWT and operated in the construction market since 2000 similar to a private company.

**Table 6.41: Mission of each division in Roads Authority**

Divisions	Missions
Network Planning & Consultation	To carry out overall planning of the road network, consult with and advise relevant stakeholders thereby contributing towards the achievement of the Roads Authority's primary mandate of managing the national road network
Construction & Rehabilitation	To manage the Design, Construction and Rehabilitation of Roads for the best interest of the road user in an economically efficient manner with due consideration to safety and progressive technical standard
Maintenance	To cost-effectively maintain and preserve the national road network, comprising the bituminous (sealed) roads, gravel and earth roads, salt roads, a large number of bridges and other drainage structures, and thousands of hectares of road reserves
Road Management System	To develop and operate coordinated and integrated support tools or systems to facilitate the efficient management of the road network and to provide information on the network
Transport Information & Regulatory Services	To ensure compliance with relevant legislation through effective enforcement to improve appropriate use of the road infrastructure and thereby contributing towards the achievement of the Roads Authority objectives
Road Traffic & Transport Inspectorate	To control overloading thereby reducing road damage and to contribute to road safety by enforcing quality systems; enforce road transport permit regulations and road user charges

Source: Website of Road Authority

## 6.4.2 Human resources

Table 6.42 indicates the numbers of approved posts and filled posts of the Roads Authority from 2007/08 to 2009/2010. The approved number of posts has increased from 458 persons to 629

persons during the period. However, the number of filled posts has increased from 317 to 393, and the percentage of vacancies has also increased from 31% to 38% in the same period. It is significant that the change in the number of filled posts by kind of jobs, administrative posts has increased from 134 persons to 162 persons from 2007/08 to 2009/10 but the number of engineers has not changed (21 persons) during the same period.

The vacancy rate indicates that the rate of general posts such as administrators, general workers is at a low level, on the other hand, the vacancy rate of technical and skilled posts such as engineers and legal officers is high level.

**Table 6.42: No of approved staffs and filled staffs of Roads Authority**

Unit: persons

Kind of jobs	2007/2008			2008/2009			2009/2010		
	Approved no of posts	Filled no of posts	No of Vacancies (vacancy rate)	Approved no of posts	Filled no of posts	No of Vacancies (vacancy rate)	Approved no of posts	Filled no of posts	No of Vacancies (vacancy rate)
Administrators	164	134	30 (18%)	225	143	82 (36%)	247	162	85 (34%)
Economists	2	1	1 (50%)	2	1	1 (50%)	2	1	1 (50%)
Engineers	27	21	6 (22%)	43	28	15 (35%)	42	21	21 (50%)
Finance	9	8	1 (11%)	20	10	10 (50%)	17	14	3 (18%)
General Workers	54	30	24 (44%)	51	41	10 (20%)	64	40	24 (38%)
Human Resources Officers	6	5	1 (17%)	14	8	6 (43%)	14	10	4 (29%)
Internal Auditors	4	3	1 (25%)	6	4	2 (33%)	14	13	1 (7%)
Legal Officers	2	2	0 (0%)	2	2	0 (0%)	3	1	2 (67%)
Roads Inspectors	61	33	28 (46%)	58	45	13 (22%)	59	46	13 (22%)
Transport Inspectors	84	54	30 (36%)	159	64	95 (60%)	128	49	79 (62%)
Technicians	45	26	19 (42%)	35	19	16 (46%)	39	36	3 (8%)
Total	458	317	141 (31%)	615	365	250 (41%)	629	393	236 (38%)

Source: Medium to Long Term Roads Master Plan Revision, July 2012

### 6.4.3 Financial situation of Roads Authority

Table 6.43 indicates the statement of comprehensive income and Table 6.44 indicates the statement of the financial position in 2011/12 and 2012/13, respectively. Almost of all revenue comes from Namibia Road Fund Administration.

**Table 6.43: Statement of comprehensive income**

Unit: N\$ 000

Items	Remarks	2012	2013
Revenue		1,008,364	1,248,803
Grant received from Namibia Road Fund Administration		1,006,550	1,247,440
Interest received		1,814	1,363
Other income	Insurance claims, Sunday income, tender documents	2,010	1,337
Operating expenditure		(820,997)	(1,029,853)
Construction and rehabilitation		(70,051)	(137,065)
Routine and periodic maintenance		(644,188)	(790,450)
Others	Fencing and compensation; Namibia traffic information systems; Road management system; R&D and feasibility studies; project administration expense; Weigh bridge maintenance	(106,758)	(102,338)
Administrative expenditure	Employee costs; other administrative expense; Road management qualification	(200,327)	(208,397)

Items	Remarks	2012	2013
Operational profit (loss)	-	(10,950)	11,890
Financial costs	-	(952)	(1,022)
Profit (loss) for the year	-	(11,902)	10,868
Transfer to Namibia Road Fund Administration	-	1,1902	(10,868)

Source: Annual Report of Roads Authority 2012/13

In 2011/12, RA overspent by N\$12 million, and the loss was compensated from Namibia Road Fund Administration. On the other hand, in 2012/13 RA made a profit of N\$11 million. The amount was transferred to Namibia Road Fund Administration.

**Table 6.44: Statement of financial position in the end of financial year**

Unit: N\$ 000

2012		2013	
Non-current assets	45,658	Non-current assets	77,744
Current assets	251,511	Current assets	279,970
Total assets	297,169	Total assets	357,714
Equity	11,678	Equity	11,679
Non-current liabilities	149,234	Non-current liabilities	177,031
Current liabilities	136,257	Current liabilities	169,004
Total liabilities	285,491	Total liabilities	346,035
Total equity and liabilities	297,169	Total equity and liabilities	357,714

Source: Annual Report of Roads Authority 2012/13

#### 6.4.4 Financial resources for road projects

Financial resources for road projects come from (1) RUC for “economically justifiable” projects, (2) government budget and loans and (3) grants from international development partners.

RFA manages RUC and is mandated to fix the level of RUC. However, the increase in the fuel levy is severely controlled by the government (MOF and Ministry of Mines and Energy). Revenues from the fuel levy represent the biggest share of RFA revenues. Therefore, this control severely restrains the capacity of RFA from adequately funding the road sector.

RUCs comprise (1) Road User Fuel Levy, (2) Registration and Annual License Fees, (3) Cross Border Charges, and (4) Mass Distance Charges which are only paid by trucks (international and domestic) according to their load and the distance travelled in Namibia.

Table 6.45 indicates the Roads Authority’s total 5-year budget for maintenance, rehabilitation and development of roads for the period of 2014/15 to 2018/19. The annual budget amount will increase from N\$2.4 billion in 2014/15 to N\$2.7 billion in 2018/19, and the total budget amounts to N\$16.1 billion over 5 years. Out of the total amount, 31% of this is used for maintenance of unpaved roads, and 27% of it is used for development of paved roads.

**Table 6.45: RA's budget for maintenance, rehabilitation and development from 2014/15 to 2018/19: total budget**

Budget Category	2014/15	2015/16	2016/17	2017/18	2018/19	Total 5 years.
Unit: N\$						
<b>Maintenance</b>						
Paved Roads	342,957,500	430,650,000	473,715,000	521,086,500	573,195,150	2,341,604,150
Unpaved Roads	497,000,000	972,455,000	1,069,700,500	1,176,670,550	1,294,337,605	5,010,163,655
<b>Rehabilitation</b>						
Paved Roads	186,000,000	901,500,000	852,500,000	450,500,000	370,400,000	2,760,900,000
<b>Development</b>						
Paved Roads	1,039,231,000	1,811,949,000	834,400,000	457,500,000	195,500,000	4,338,580,000
Unpaved Roads	106,572,000	289,326,000	253,083,700	167,843,000	20,035,000	836,859,700
Labour based development: Unpaved Roads	84,961,000	446,030,000	237,735,000	39,155,000	460,000	808,341,000
<b>Total</b>	<b>2,419,164,000</b>	<b>5,032,396,750</b>	<b>3,915,269,625</b>	<b>3,026,304,018</b>	<b>2,688,831,619</b>	<b>16,096,448,505</b>

Source: Five Year Budget for the Period 2014/15–2018/19, Roads Authority

The total 5-year budget is divided by financial sources: RFA, GRN's budget and loan & grant from the international development partners as indicated in Table 6.46, Table 6.47 and Table 6.48, respectively. The budget from RFA represents 53% of the total 5-year budget amount, and is used for maintenance of paved roads and unpaved roads. The budget from GRN's budget comprises 41% of the total 5-year budget amount, and is used for development of paved roads and unpaved roads. The percentage of loans & grants is only 6% of the total 5-year budget.

Table 6.46 also indicates that the RFA budget after 2015/16 remains at the same level. It means that that an increase in revenue from the RFA is not expected after 2015/16.

**Table 6.46: RA's budget for maintenance, rehabilitation and development during 2014/15 and 2018/19: RFA**

Budget category	2014/15	2015/16	2016/17	2017/18	2018/19	Total 5 years.
<b>Maintenance</b>						
Paved Roads	317,957,500	430,650,000	473,715,000	521,086,500	573,195,150	2,316,604,150
Unpaved Roads	472,000,000	972,455,000	1,069,700,500	1,176,670,550	1,294,337,605	4,985,163,655
<b>Rehabilitation</b>						
Paved Roads	114,500,000	354,000,000	348,500,000	243,500,000	81,900,000	1,142,400,000
<b>Development</b>						
Paved Roads	63,000,000	7,000,000	1,500,000			71,500,000
Labour based development: Unpaved Roads						0
<b>Total RFA</b>	<b>967,457,500</b>	<b>1,764,105,000</b>	<b>1,893,415,500</b>	<b>1,941,257,050</b>	<b>1,949,432,755</b>	<b>8,515,667,805</b>

Source: Five Year Budget for the Period 2014/15–2018/19, Roads Authority

**Table 6.47: RA's budget for maintenance, rehabilitation and development during 2014/15 and 2018/19: GRN's Budget**

Budget category	2014/15	2015/16	2016/17	2017/18	2018/19	Total 5 years
<b>Maintenance:</b>						
Paved Roads	25,000,000					25,000,000
Unpaved Roads	25,000,000					25,000,000
<b>Rehabilitation:</b>						
Paved Roads	71,500,000	547,500,000	504,000,000	207,000,000	288,500,000	1,618,500,000
<b>Development:</b>						
Paved Roads	681,231,000	1,484,949,000	742,900,000	445,500,000	195,500,000	3,550,080,000
Unpaved Roads	106,572,000	289,326,000	253,083,700	167,843,000	20,035,000	836,859,700
Labour based development: Unpaved Roads	70,961,000	335,530,000	152,635,000	31,980,000	345,000	591,451,000
<b>Total</b>	<b>980,264,000</b>	<b>2,657,305,000</b>	<b>1,652,618,700</b>	<b>852,323,000</b>	<b>504,380,000</b>	<b>6,646,890,700</b>

Source: Five Year Budget for the Period 2014/15–2018/19, Roads Authority

**Table 6.48: RA's budget for maintenance, rehabilitation and development during 2014/15 and 2018/19: loans and grants**

Budget category	2014/15	2015/16	2016/17	2017/18	2018/19	Total 5 years
Development:						
Paved Roads	295,000,000	320,000,000	90,000,000	12,000,000	0	717,000,000
Labour based development: Unpaved Roads	14,000,000	110,500,000	85,100,000	7,175,000	115,000	216,890,000
Total	309,000,000	430,500,000	175,100,000	19,175,000	115,000	933,890,000

Source: Five Year Budget for the Period 2014/14-2018/19, Roads Authority

### 6.4.5 Road network

The total length of the classified road network amounts to 44,931 km, of which 7,057 km (15% of the total length) is paved, and 26,027 km (56% of the total length) are gravel roads. The rest are salt roads (304 km, equivalent 1% of the total length) and earth roads (11,542 km or 25% of the total length). In addition, there are 1,446 km of roads that are going to be constructed in the future.

Namibian roads are classified and proclaimed as Trunk Roads, Main Roads, District Roads and Farm Roads. Farm Roads, of which the length is estimated to be about 23,000 km, are not considered in this master plan study. The length of the Trunk Road network is 4,592 km, representing 10 % of the total length of the road network. The length of the Main Road network is 11,347 km or 25% of the total network. The length of the District Road network is 28,803 km, equivalent to almost two thirds of the network.

Almost all Trunk Roads (98%) are paved, while most Main Roads (79%) are gravel roads and only 18% of the Main Roads are paved. A small percentage of the Main Roads are earth roads. Almost all District Roads are gravel (59%) or earth roads (39%).

Trunk Roads are generally numbered as "B" roads, Main Roads are generally numbered as "C" roads, and District Roads are numbered as "D" roads.

**Table 6.49: Road network by classification**

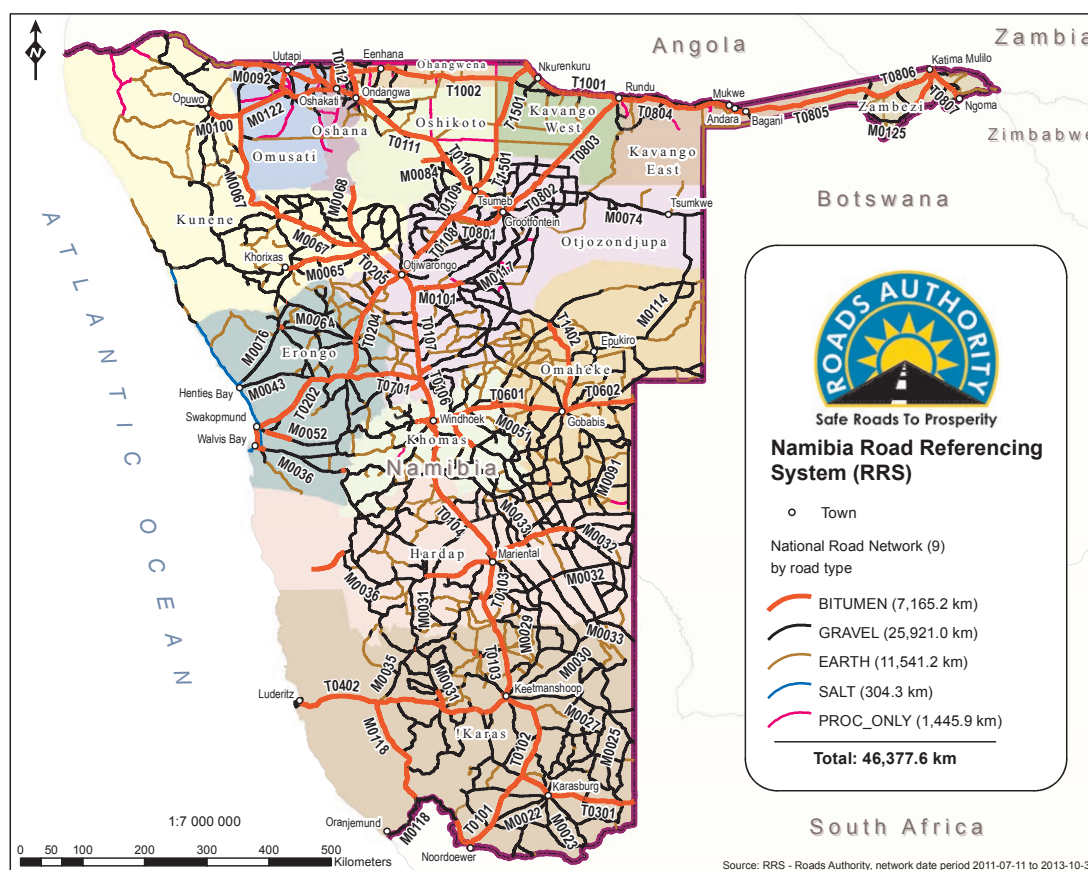
Classification	Surface type (km)				Total (km)
	Paved	Gravel	Salt	Earth	
Trunk road	4,676 (98%)	104 (2%)	0 (0%)	0 (0%)	4,780 (10%)
Main road	2,090 (18%)	8,895 (79%)	126 (1%)	236(2%)	11,347 (25%)
District road	291 (1%)	17,028 (59%)	178 (1%)	11,306 (39%)	28,803 (62%)
Total	7,057 (15%)	26,027 (56%)	304 (1%)	11,542 (25%)	46,376 (100%)

Source: Road Summary Report Network ID9, Roads Authority

**Table 6.50: Road classification and definition**

Classification	Definition
Trunk Roads	A public road that forms part of the road system connecting Namibia as a whole with neighbouring countries or major ports
Main Roads	A public road connecting important centres in Namibia
District Roads	A public road carrying a reasonable amount of traffic

Source: Geometrical Manual 1<sup>st</sup> Edition (Draft) prepared by RA



Source: Website of Road Authority

**Figure 6.11: Road network in Namibia**

One of the main characteristics of the Namibian paved road network is that about 60% of the paved roads, representing 3,900 kilometres, correspond to sections of transport corridors: Trans-Kalahari towards Botswana and Gauteng Province in South Africa, WNLDC towards Zambia and DRC, Trans-Cunene towards southern Angola, and Trans-Orange towards Northern Cape Province in South Africa.

**Table 6.51: Road corridor length in Namibia**

Corridor	Section	Length (km)
<b>Trans-Kalahari:</b> Botswana and Gauteng Province in South Africa	Walvis Bay – Karibib – Buitepos (Botswana border)	710
<b>WNLDC:</b> Zambia and DRC	Otavi – Katima Mulio (Zambia border)	1,389
<b>Trans-Cunene:</b> Southern Angola	Karibib – Otavi – Oshikango (Angola border)	897
<b>Trans-Orange:</b> Northern Cape Province in South Africa	Windhoek – Keetmanshoop	505*
	Lüderitz – Keetmanshoop – Noordoewer	671
<b>Total</b>		<b>3,905</b>

Source: \* Namibia Integrated Transport Master Plan, Road Reference system, Corridor Detail Report – Networks 9, Roads Authority

#### 6.4.6 Road conditions

A Road Management System (RMS) has been developed within the Road Authority to regularly monitor the condition of the road network. The condition of the paved road network in 2010 is

presented in the Medium to Long Term Road Master Plan (MLTRMP). This is summarized as follows.

#### 6.4.6.1 Paved road

One of the main findings presented in the MLTRMP is that the condition of the paved road network has regularly deteriorated over the last few years. Significant rehabilitation or resurfacing works needs to be carried out within the next three years otherwise the situation will become critical:

- In 1990, about 80% of the roads were in “Very good” or “Good” condition, the remaining 20% being in “Fair” condition. However, in 2010, the percentage of roads in “Very good” or “Good” condition reduced to only 50% with 9% in “Poor” or “Very poor” condition (representing approximately 600 kilometres).
- Based on the current trend of deterioration, approximately 38% of the paved roads (representing approximately 2,400 kilometres) will reach the end of their remaining life within the next five years.
- Totally, about 66% of the paved roads (representing 4,400 kilometres) require surfacing works within the next three years (reconstruction, rehabilitation, periodic maintenance or resealing).

Within this context, the MLTRMP puts the emphasis on the rehabilitation and maintenance of the paved road network.



Source: JICA Study Team

**Photo 6.5: Road improvement (re-surfacing) works:  
Otjiwarongo – Otavi (left) and Gobabis – Buitepos (right)**

Table 6.52 indicates result of pavement assessment for rehabilitation and reseal of Trunk Roads by Pavement Management System, the Roads Authority, and Figure 6.12 and Figure 6.13 show needs for rehabilitation and reseal of Trunk Roads.

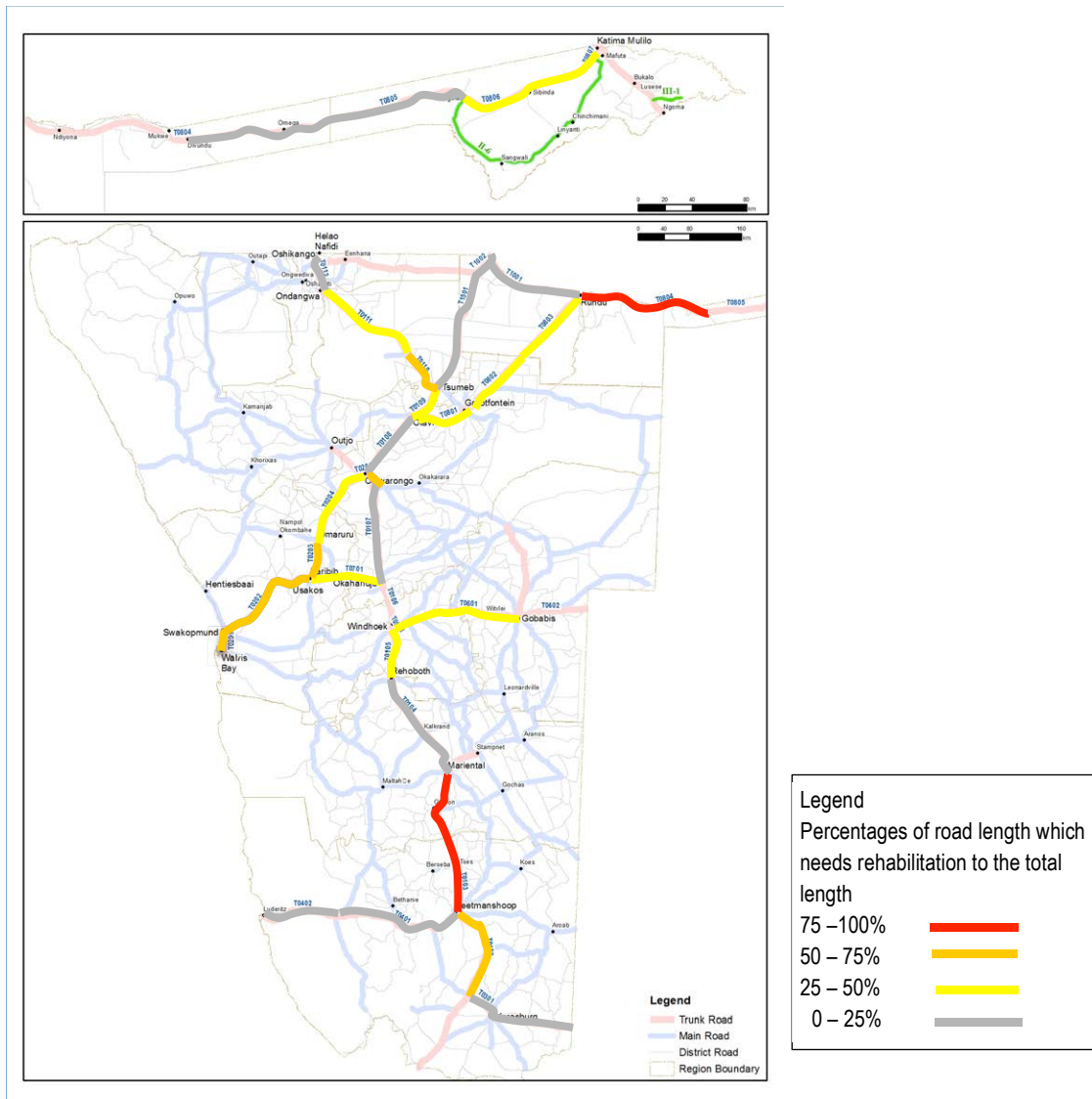


**Table 6.52: Result of pavement assessment**

Road number	Total length of road (km)	Road average width* (m)	Length (km)		Remaining length (km)
			Needs for rehabilitation	Needs for reseal	
Maintenance region: Oshakati					
T0111	159.66	7.1	65.08 (41%)	38.58 (24%)	56.00 (35%)
T0112	60.03	6.8	7.53 (13%)	46.50 (77%)	6.00 (10%)
T0803	131.05	7.3	58.00 (44%)	35.00 (27%)	38.05 (29%)
T0804	146.89	7.2	119.89 (82%)	14.50 (10%)	12.50 (9%)
T0805	195.80	7.0	29.80 (15%)	155.50 (79%)	10.50 (5%)
T0806	116.88	6.0	55.38 (47%)	21.50 (18%)	40.00 (34%)
T0807	73.50	7.0	40.50 (55%)	22.50 (31%)	10.50 (14%)
T1001	169.48	7.0	26.50 (16%)	24.00 (14%)	118.98 (70%)
T1002	283.40	7.0	67.00 (24%)	10.50 (4%)	205.90 (73%)
T1501	101.00	7.0	0.00 (0%)	0.00 (0%)	101.00 (100%)
Maintenance region: Otjiwarongo					
T0107	95.95	7.2	16.45 (17%)	70.00 (73%)	9.50 (10%)
T0108	117.76	7.0	26.76 (23%)	51.00 (43%)	40.00 (34%)
T0109	61.95	6.2	30.45 (49%)	18.50 (30%)	13.00 (21%)
T0110	94.95	7.0	47.95 (51%)	18.50 (19%)	28.50 (30%)
T0201	33.14	7.0	16.64 (50%)	15.50 (47%)	1.00 (3%)
T0202	145.67	6.3	76.17 (52%)	45.50 (31%)	24.00 (16%)
T0203	62.59	6.5	44.09 (70%)	14.50 (23%)	4.00 (6%)
T0204	132.43	6.6	46.43 (35%)	26.50 (20%)	59.50 (45%)
T0205	72.88	6.7	55.38 (76%)	17.50 (24%)	0.00 (0%)
T0701	95.18	6.4	24.68 (26%)	9.00 (9%)	61.50 (65%)
T0801	89.45	6.6	34.45 (39%)	53.00 (59%)	2.00 (2%)
T0802	127.71	7.3	32.50 (25%)	30.21 (24%)	65.00 (51%)
T1501	98.04	7.3	8.54 (9%)	2.00 (2%)	87.50 (89%)
Maintenance region: Windhoek					
T0104	101.13	6.3	13.50 (13%)	1.00 (1%)	86.63 (86%)
T0105	83.58	7.7	25.58 (31%)	16.50 (20%)	41.50 (50%)
T0107	80.50	7.0	15.00 (19%)	58.50 (73%)	7.00 (9%)
T0601	199.70	6.7	95.70 (48%)	68.50 (34%)	35.50 (18%)
T0701	54.85	6.4	19.00 (35%)	4.00 (7%)	31.85 (58%)
T1402	156.40	6.9	51.40 (33%)	31.50 (20%)	73.50 (47%)
Maintenance region: Keetmanshoop					
T0101	142.74	6.6	6.50 (5%)	111.24 (78%)	25.0 (18%)
T0102	158.42	6.6	86.42 (55%)	71.50 (45%)	0.50 (0%)
T0103	229.67	6.8	208.17 (91%)	20.00 (9%)	1.50 (1%)
T0104	75.00	6.3	51.00 (68%)	23.50 (31%)	0.50 (1%)
T0301	178.96	6.3	30.46 (17%)	148.00 (83%)	0.50 (0%)
T0401	111.00	6.9	9.00 (8%)	0.50 (0%)	101.50 (91%)
T0402	123.54	6.5	2.54 (2%)	59.50 (48%)	61.50 (50%)
T0101	142.74	6.6	6.50 (5%)	111.24 (78%)	25.0 (18%)
T0102	158.42	6.6	86.42 (55%)	71.50 (45%)	0.50 (0%)
T0103	229.67	6.8	208.17 (91%)	20.00 (9%)	1.50 (1%)

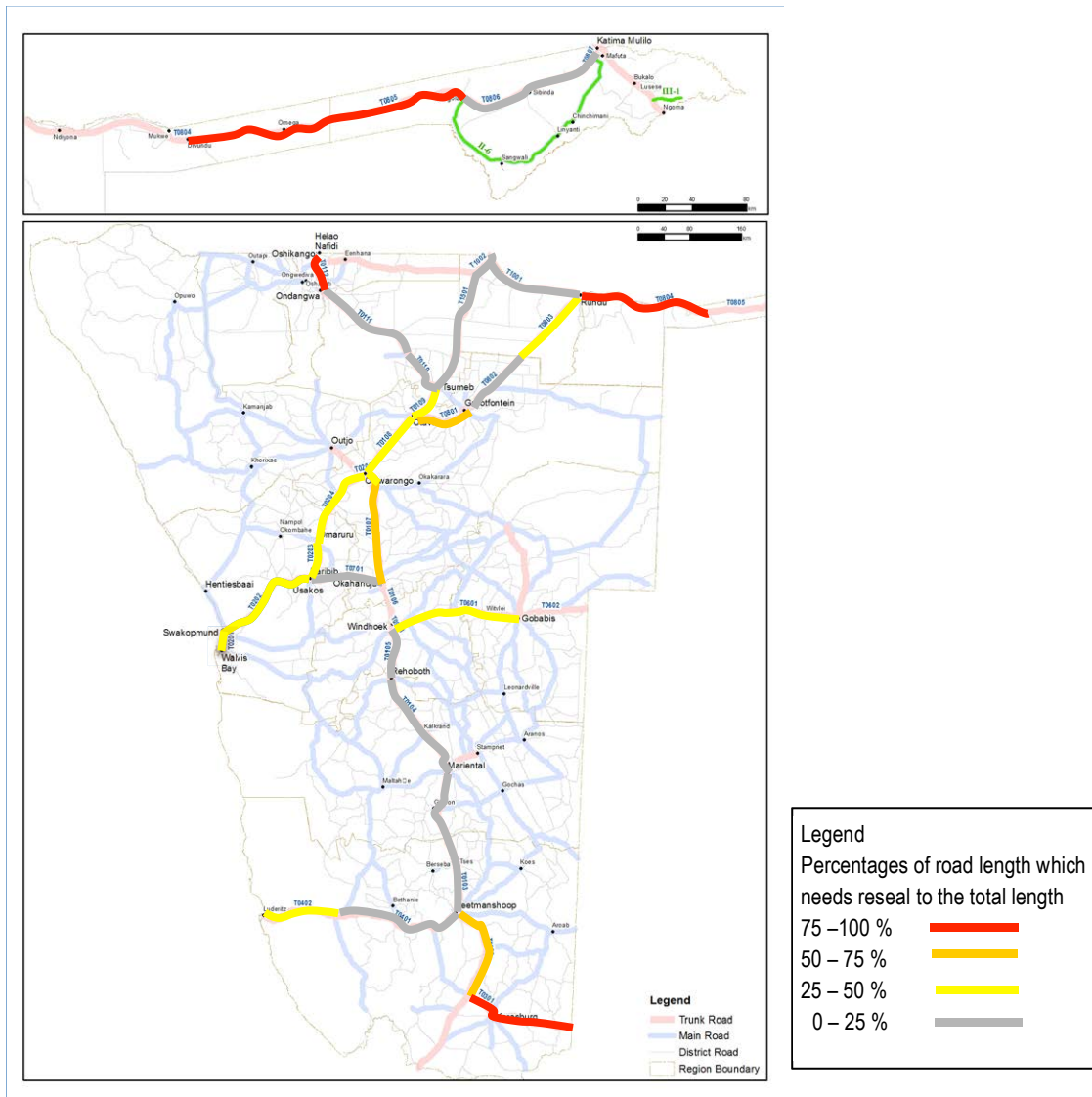
Note: \* indicates minimum average width

Source: Pavement Management System, Roads Authority



Source: Pavement Management System, Roads Authority

**Figure 6.12: Condition of trunk road (needs for rehabilitation)**



Source: Pavement Management System, Roads Authority

**Figure 6.13: Trunk road condition (needs for resal)**

#### 6.4.6.2 Unpaved road

The results of the visual inspection show that in 2010, about 38% of the unpaved roads that were surveyed (about 34,500 km out of a total of 37,500 km) were in “Poor” or “Very poor” condition, representing 13,000 km. Eight years before, in 2002, the percentage of unpaved roads in “Poor” or “Very poor” condition was only 20%, about half the present value, which shows a significant deterioration of the unpaved road network over the last years.

#### 6.4.7 Road traffic

Traffic counts are performed on a regular basis by the RA (RMS) on the main road network (90 automatic counting stations and mobile stations). In addition, specific surveys (traffic counts and

possibly origin/destination surveys) have been performed for the purpose of specific road projects.

Due to the size of the countries, the low population and the large barren zones, the traffic on Namibian roads is low.

#### 6.4.7.1 Traffic on paved roads

There is only 255 kilometres of paved roads, representing 3% of the total length of paved roads, with a traffic load (in Average Annual Daily Traffic; AADT) higher than 3,000 vehicles per day. The traffic is lower than 1,000 vehicles per day on 76% of the paved roads and the average traffic on paved roads is only 766 vehicles per day, which is low compared with African standards where it is estimated to be 1,050 vehicles per day in low-income countries, 1,500 vehicles per day in lower middle income countries (twice the traffic on Namibia paved roads which belongs to this category) and almost 3,000 vehicles per day in upper middle-income countries.

**Table 6.53: Road traffic of paved roads**

Traffic category	Length (km)	Share of total length (%)
0 - 49 vehicles/day	45	1
50 - 199 vehicles/day	1,062	16
200 - 499 vehicles/day	2,394	36
500 - 999 vehicles/day	1,581	24
1,000 - 1,449 vehicles/day	610	9
1,500 - 2,000 vehicles/day	407	6
2,000 - 3,000 vehicles/day	339	5
>3,000 vehicles/day	226	3
All categories	6,663	100

Source: Road Authority Medium to Long Term Road Master Plan (revision 2012)



Source: JICA Study Team

**Photo 6.6: Traffic conditions:  
Walvis Bay – Swakopmund (Left) and Karibib – Otjiwarongo (Right)**

#### 6.4.7.2 Traffic on unpaved roads

The traffic on unpaved roads is significantly lower than on paved roads, the traffic is lower than 50 vehicles per day for almost 80% of the unpaved roads, as indicated in Table 6.54. There is only 820

kilometres of unpaved roads, representing 2% of the total length where the traffic is more than 200 vehicles per day.

The traffic on Namibian unpaved roads is low compared with African standards where it is on average 50 vehicles per day in low-income countries and 100 vehicles per day for lower middle-income countries.

**Table 6.54: Road traffic on unpaved road**

Traffic volume (vehicles/day)	Length (km)	Proportion of total length (%)
0 – 49	29,770	79
50 – 199	6,870	18
200 – 499	818	2
All categories	37,458	100

Source: Road Authority Medium to Long Term Road Master Plan (revision 2012)

#### 6.4.7.3 Traffic and road classification

The traffic is highly concentrated on trunk roads where AADT was about 1,060 vehicles per day in 2011. On main roads, the average AADT was 170 vehicles per day the same year (18% of the average traffic on trunk roads) whilst it was only 33 vehicles per day on district roads (3% of the traffic on trunk roads).

The corridors are the most trafficked roads particularly the Trans–Kalahari between Walvis Bay and Windhoek, the northern section of the Trans–Orange when approaching Windhoek and the Trans–Cunene.

#### 6.4.7.4 Traffic on corridors

##### Trans–Kalahari Corridor

Along the Trans–Kalahari corridor, the AADT is always higher than 2,200 vehicles per day of which more than 340 are heavy vehicles on all section between Walvis Bay and Windhoek. The most heavily trafficked section is the section between Walvis Bay and Swakopmund (almost 6,000 vehicles per day of which about 340 trucks) and between Okahandja and Windhoek (4,500 vehicles per day, of which 620 trucks north of Brakwater, the traffic reaching 8,200 vehicles per day and 1,200 trucks when approaching Windhoek, south of Brakwater). Toward the border with Botswana east of Windhoek, the traffic is significantly lower east of HK airport: about 1,000 vehicles per day up to Gobabis, but only 207 vehicles at Buitepos at the border with Botswana. The percentage of trucks increases further eastward (87% representing about 180 trucks per day at the border).

##### Trans–Cunene and WNLDCs

The traffic on the common sections of the Trans–Cunene and WLNDC south of Otavi is about 1,700 to 2,500 vehicles per day of which 450 to 500 are trucks (considering both branches coming from Walvis Bay or from Windhoek). North of Otavi about two thirds of the traffic follow the Trans–

Cunene (1,300 vehicles per day of which 300 to 350 trucks), the remaining third following the WNLDC (500-600 vehicles per day of which 120 to 150 trucks). The traffic increases when approaching the borders: it reaches 7,000 vehicles per day of which 450 are trucks at Oshikango at the border with Angola and 1,100 vehicles per day of which only 75 trucks after Katima Mulilo at the border with Zambia. The traffic to Botswana following the WLNDC (crossing the border at Ngoma) is only 200 vehicles per day of which less than 30 are trucks.

### **Trans–Orange Corridor**

Along the southern sections of the Trans–Orange corridor, the AADT is about 200 vehicles per day with a very high percentage of trucks (65 to 70%). Totally, if both southern and eastern branches of the Trans–Orange are considered, the number of vehicles travelling on this corridor each day is about 400 of which 250 are trucks. The traffic steadily increases northward and reaches 3,000 vehicles per day of which 360 are trucks north of Rehoboth when approaching Windhoek.

**Table 6.55: Road traffic on Namibian corridors**

Section of corridors	AADT		
	Total	Heavy vehicles	% of Heavy vehicles
<b>Trans – Kalahari Corridor</b>			
Walvis Bay – Swakopmund	5,909	342	6
Swakopmund – Arandis	2,753	458	17
Arandis – Karibib	2,295	474	21
Okahandja – Brakwater	4,504	617	14
Brakwater – Windhoek	8,420	1,208	14
Windhoek – HK Airport	5,909	354	9
HK Airport – Gobabis	987	241	24
Gobabis – Buiepos (border with Botswana)	207	181	87
<b>WNLDC</b>			
Walvis Bay – Karibib (same as Trans – Kalahari)			
Karibib – Otjiwarongo	720	164	23
Otjiwarongo – Otavi	1,730	455	26
Otavi – Grootfontein	671	149	22
Grootfontein – Rundu	442	129	29
Rundu – Bagani	435	109	25
Katima Mulilo – Zambian border	1,118	75	7
Katima Mulilo – Ngoma (border with Botswana)	288	27	9
<b>Trans – Cunene Corridor</b>			
Otavi – Tsumeb	1,313	330	25
Tsumeb – Oshivelo	1,225	343	28
Ondangwa – Onuno	2,200	232	11
Onuno – Oshikango (border with Angola)	7,064	439	6
<b>Trans – Orange Corridor</b>			
Eastern branch			
Ariamsvlei (border with SA) – Karasburg	182	118	65
Karasburg – Grunaü	205	127	62
Southern branch			
Noordeower (border with SA) – Grunaü	175	122	70
Core corridor			
Grunaü – Keetmanshoop	578	237	41
Rehoboth – Windhoek	3,090	358	12

Source: Road Authority – Medium to Long Term Road Master Plan (revision 2012)

### 6.4.8 Planned and on-going projects

The major completed/on-going and planned projects are indicated in Table 6.56. There are 12 projects identified as of July 2012.

**Table 6.56: List of recently completed/on-going and planned project**

Projects		Status as of July 2012
1	Direct eastern link between Trans-Kalahari and WNLDC/Trans-Cunene Corridor (Gobabis - Grootfontein)	Surfacing work between Gobabis and Otjinene (157km) were completed in July 2012. The feasibility of Otjinene to Grootfontein has already been finished. The RA has got the money for the design of this section in the 2012 budget. However, the funds for the construction of this road were not yet secured or budgeted.
2	Direct northern link between the trans-Cunene and WNLDC (road from Angola to Zambia) (TR1 south of Oshikango - Rundu)	420 km road (TR10) following the Angolan border and linking TR1 between Ondangwa and Oshikango (Trans-Cunene) to TR8 in Rundu (Trans-Caprivi) was entirely paved. The last 70 km section between Elundu and Okongo has just been upgraded to bitumen standard (opening 6th July 2012).
3	New Windhoek - Luanda corridor (Tsumeb - Katitwe at the border with Angola)	The 220 km road from Tsumeb to the border with Angola at Katitwe is presently being upgraded to bitumen standard. Works have started three years ago and was completed in July 2012.
4	New direct route from Walvis Bay to northern Namibia and possible alternative to trans-Cunene corridor (Swakopmund - Henties Bay - Kamanjab)	A feasibility study of the new route has been undertaken in 2008 for the construction of a paved road. The road between Otjiwarango and Kamanjab and its continuation north of Kamanjab up the junction with MR122 at Omakange is already paved.
5	Touristic road/possible alternative route to trans-orange corridor (Walvis Bay - Solitaire - Goabeb)	A consultant has been recently appointed to carry out the feasibility study for upgrading to bitumen standards the existing gravel roads.
6	New roads in southern Namibia near the border with South Africa (Oranjemund - Rosh Pinah and Noordoewer - Rosh Pinah)	A feasibility study has been carried out for a road following river Orange from Oranjemund to Rosh Pinah. The construction of this road would be costly since the terrain is very difficult. Therefore, construction of the road is not yet planned.
7	New direct road Walvis Bay - Windhoek via Us Pass	A pre-feasibility study for a direct road linking Walvis Bay to Windhoek has been performed in 2004. The first section of the new direct road has been built to gravel road standard. Presently, this project seems not to be a priority for the Government.
8	<b>New road between Walvis Bay and TR2 at Swakopmund</b>	<b>Feasibility study is on-going to upgrade to bitumen standard the 40 km-long salt road parallel to the existing coastal paved road (TR2 or B2) linking Swakopmund to Walvis Bay</b>
9	<b>Rehabilitation of existing paved roads</b>	TR1 between Grunau to Windhoek: a Namibian consultant is presently carrying out the investigations and survey for the rehabilitation of the Grunau - Mariental section. TR1 from Windhoek to Otjiwarongo (210 km): RA plans to appoint very soon a consultant for the study of the first section of this road from Windhoek to Okahandja (66 km). Trans-Kalahari corridor between Windhoek and the border with Botswana (260 km) WNLDC: the 150 km-long section of road north of Mururani gate up to Rundu needs urgently to be rehabilitated. Works were supposed to start but it has been decided that the available funds would be used for another urgent project. Trans-Cunene corridor between Tsumeb, Ondangwa and Oshakati: funds are planned to be used for the rehabilitation of the 60 km-long section between Onyati and Ondangwa.
10	<b>Dualing and widening works on roads near Windhoek</b>	In 2001, African Development Bank has contemplated financing the widening of sections of TR1 from Windhoek to Okahandja. This project comprised sections with dual carriageway or third lane for overpassing. Now, phase 1 of upgrading works is being implemented.
11	New paved roads in the northern regions	8 On-going or planned works (gravel roads presently being upgraded to bitumen standards).

Source: Namibia Integrated Transport Master Plan

The following projects are included in the corridors and are very important from a development and strengthening of point of view. These projects should be implemented parallel with the expansion and development schedule of Walvis Bay Port.



- No.8: New road between Walvis Bay and TR2 at Swakopmund,
- No.9: Rehabilitation of existing paved roads, and
- No.10: Dualing and widening works on roads near Windhoek.

#### **6.4.9 Issues on road development**

For the “development of logistics hub” it is essential to focus on trunk roads within corridors. Bottlenecks of the roads are as follows.

- Traffic of 76% of the paved roads carry lower than 1,000 vehicles per day and the average traffic on paved roads is only 766 vehicles per day. Therefore, traffic flow on paved roads is very smooth at present except for some sections such as the suburbs of Windhoek, Walvis Bay ~ Swakopmund, and uphill. Increase by addition of a traffic lane at these sections is necessary for smooth traffic flow and road safety.
- Based on the current trend of deterioration, approximately 38% of the paved roads (representing approximately 2,400 kilometres) will reach the end of their remaining life within the next five years. Therefore, significant rehabilitation or resurfacing works of paved roads needs to be carried out within the next three years otherwise the situation will become critical. First priority should be given to trunk roads within corridors.

#### **6.5 Rail development in Namibia**

The rail system of Namibia was managed and operated by the Republic of South Africa until 1985. Organizational reforms took place after independence and now TransNamib Holdings Limited, fully owned by the Government, manages and operates the railway system.

TransNamib does not pay user charges for the use of the infrastructure (rail tracks) but is responsible for maintenance thereof. TransNamib maintains only the section of the network where trains are operated. However, TransNamib is also involved in road transport along routes that are a prolongation of railway routes (door-to-door delivery).

The Government builds new infrastructure with funds from donors or from the Government’s budget.

##### **6.5.1 Organization**

Two organizations, namely the Ministry of Works and Transport (MWT) and TransNamib, are involved in management and operation of the railways.

###### **6.5.1.1 MWT**

The Directorate of Railways (DOR) is in charge of planning, designing, constructing, maintaining, managing and controlling the railway infrastructure (both civil and rolling stock) in the country as well

as to ensure the provision of railway services, and compliance with the National Transport Services Holding Company Act. Responsibilities of MWT are:

- Development of new railway lines and major rehabilitation activities, and
- Procurement of the necessary contracts and obtaining of alternative financing support from Donors and International Financing Institutions.

### 6.5.1.2 TransNamib

TransNamib Holdings Ltd, which was established as the former TransNamib Limited in 1998, is fully owned by the Government of the Republic of Namibia. Services of TransNamib are split into three core businesses: transport, properties and parcels.

TransNamib provides regular rail passenger services, touristic rail services, road freight services, rail freight services including mining, construction materials, oil and agricultural products, and rail intermodal services with containers.

#### Organizational structure

TransNamib is governed by a Board of Directors that consists of independent non-executive directors, including the Chairman. The directors to this board are appointed by the Minister of Works and Transport, and hold office for a period of three years. The board of directors is responsible for discussing and setting the direction of the Company through preparation of objectives, strategies and key policies. The board consists of a chairperson and other 6 members.

The Executive Management Team under the leadership of the Chief Executive Officer (CEO) ensures that the company achieves TransNamib's strategic objectives set by the Board.

Under the CEO, there are 8 departments, namely marketing and sales, operation, engineering, human resources, finance, information systems, corporate services and properties. Table 6.57 indicates key functions of major departments.

**Table 6.57: Key functions of major departments**

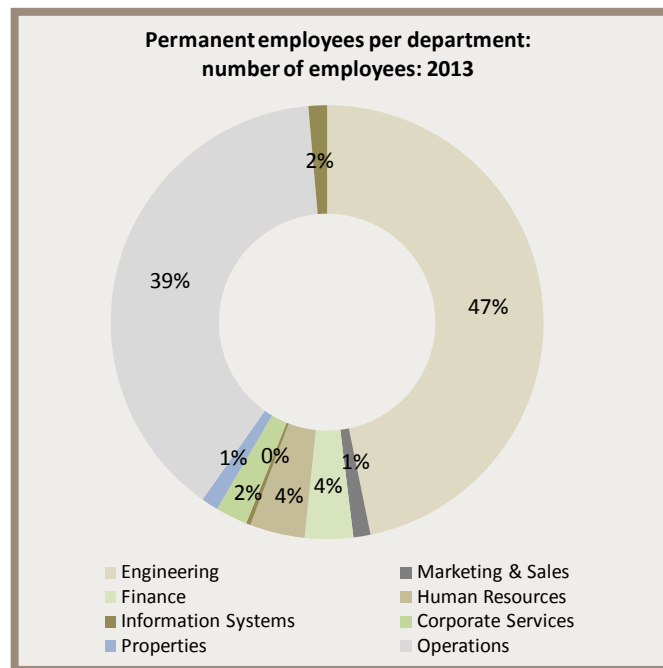
Major departments	Key functions
Market & sales	The main function is to attract and retain customers and to co-ordinate sales activities i.e. to meet customer demand with the appropriate supply of services. The department primarily focuses on driving the company strategic plan. One of the other goals of the department is to increase the sales volume considering a particular period of time. The department is also responsible for meeting the sales volumes forecasted by the company. The department is concerned with Customer Care, Marketing and Sales, Business Development, and Market Research.
Operation	The department is in charge of the company's day-to-day operational functioning. The key functions of the Operations Department include: Service delivery, involving freight handling; Road transport operations, providing freight transport services by road, aiming at proposing door to door services whenever required; Train operations, concerning the training running related activities for freight passenger services, aiming at providing cost-effective and safe rail transport services for passengers.
Engineering	The department is mainly responsible for technical service functions at TransNamib. The department is responsible for the safe operation of the passenger and cargo trains and the maintenance of all assets. The department carries out the following functions: Maintenance of the railway infrastructure, buildings including stations and bridges; Repair and maintenance of locomotives, vehicles, carriages and wagons; Installation, repair and maintenance of telecom,

Major departments	Key functions
	radio, electronic and electrical systems and equipment; Research and development of company infrastructure and other equipment.
Human resources	The department plays a major role in staffing, training and helping to manage people so that people and the organization perform at maximum capability in a highly fulfilling manner. The key functions of Human Resources are: Handling payroll, recruitment and selection, as well as the termination of services; Training and development that involve technical and non-technical training, career development, succession planning and organisational development interventions; Industrial relations, which include: employee relations, climate monitoring of employee attitudes and conditions; and Health, safety and loss control that is concerned with injury on duty, environmental assessment, occupational health and safety inspection. In essence, the department strives to empower TransNamib to successfully meet strategic goals by managing staff effectively.
Finance	The Department's duties include financial accounting (debtors and creditors), management accounting (budgeting), as well as procurement (purchasing and tender management). This Department mainly aims to: provide strategic financial support regarding operational and general business planning; provide daily financial services functions to the company; and oversee the internal and external needs and financial reporting requirements of the company at large. The Finance Department generally focuses on providing relevant information necessary for upper level management. Such information is crucial in determining how TransNamib can make better financial decisions.

Source: TransNamib Website

### Human resources

TransNamib employs 1,802 people. Figure 6.14 indicates the division of the employees by departments as at 31 March 2013. 47% of the employees belong to the Engineering Department, and 39% of the total employment belongs to operation department, respectively.



Source: Annual Report 2013, TransNamib

**Figure 6.14: Permanent employees by departments in 2013**

## 6.5.2 Railway network and characteristics of railway lines

### 6.5.2.1 Railway network

At present, TransNamib operates 2,478 kilometres of single-track railway lines. The railway network in Namibia consists of a core trunk line, north line, northeast line, and 3 branches. The railway network is shown in Figure 6.15, and Table 6.58 gives the characteristics of each railway line.



Source: TransNamib

**Figure 6.15: Railway lines in Namibia**

**Table 6.58: Railway network**

Railway lines and characteristics		Length
Core trunk line	Linking the border with South Africa at Ariamsvlei / Nakop to Walvis Bay which is the main port of the country. It passes via (from South to North): Seeheim (origin of the branch to Lüderitz, see below), Windhoek (origin of the branch to Gobabis), Kranzberg (where the line continues toward the north) and Walvis Bay. This line is connected at Nakop to the South African network. It is presently operational along its entire length and carries most of the Namibian rail traffic.	1,286 km
North line	Starting at Kranzberg (on the Windhoek – Walvis Bay main line) and passing (from south to north) via Otjiwarongo (origin of the Otjiwarongo – Outjo branch, see below), Otavi (origin of the	697 km

Railway lines and characteristics		Length
	north eastern branch), Tsumeb. After Tsumeb, the line has recently been extended to the north up to the border with Angola: a first section of 246 km between Tsumeb and Ondangwa was built in 2006. A further 60 km has been inaugurated on the 5th July 2012. It stops at Oshikango, a few metres from the border with Angola.	
North-east line	Linking Otavi to Grootfontein	90 km
Branches	<b>Aus / Lüderitz branch:</b> This branch used to link the main line at Seeheim to Lüderitz, the second port of the country. Presently, this line is not operational along its entire length. The line is operational from Seeheim (on the main line to Walvis Bay) to Aus. Reconstruction works between Aus and border of Lüderitz had been completed in November 2014. Remaining part of the branch (between the border and the port) is supposed to be reconstructed in 2015.	180 km
	<b>Windhoek – Gobabis branch</b>	225 km
	<b>Otjiwarongo – Outjo branch:</b> this branch which used to be about 60 km long is presently not operational.	(60 km)
Total		2,478 km

Source: Namibia Integrated Transport Master Plan

### 6.5.2.2 Characteristics of railway lines

The entire network is single track, trains waiting at sidings before crossing. Most of the network is equipped with ballasted track. Table 6.59 shows characteristics of the railway lines of TransNamib.

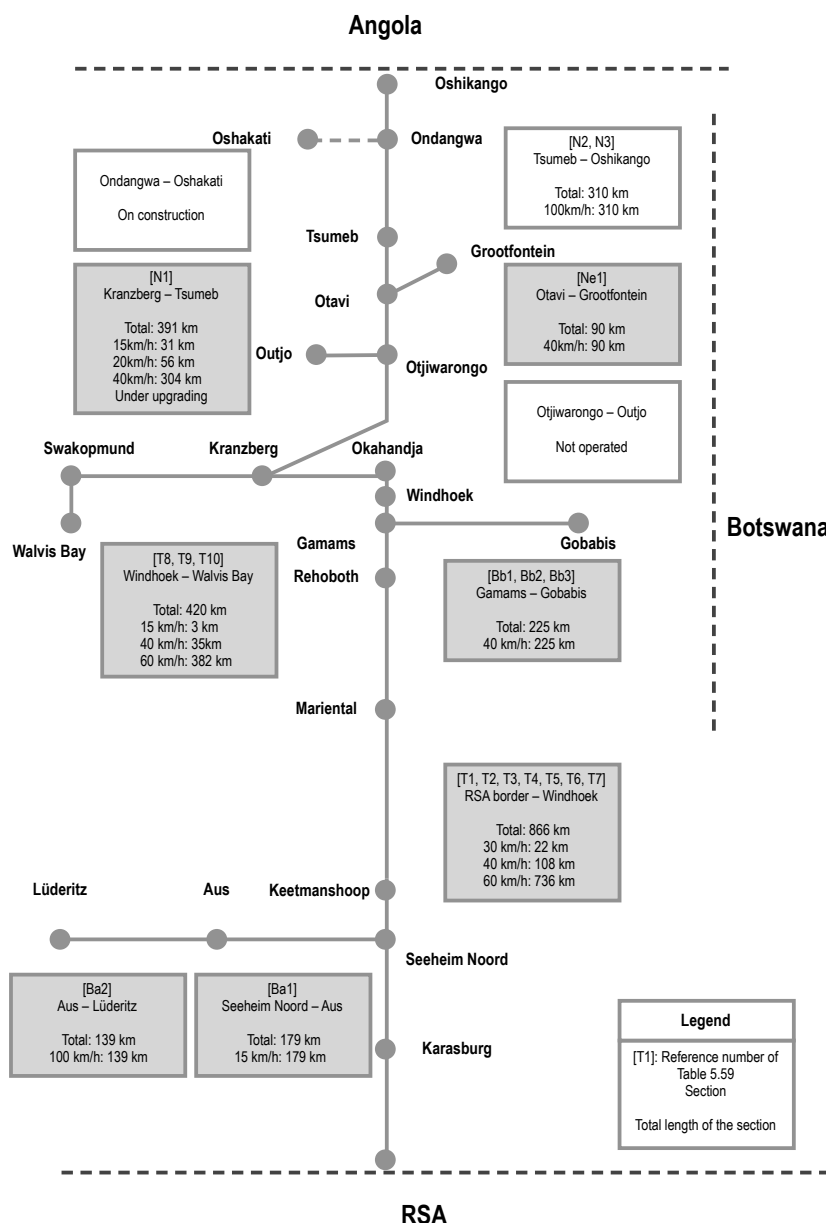
**Table 6.59: Characteristics of rail lines**

Lines	Standard	Exception or limitation
<b>Existing line</b>		
Gauge	1,067 mm (3 feet 6 inch) "Cape Gauge"	
Minimum radius	300 metres	
Maximum grades	2%	2.5%
Rail weight	Generally 30 kg/m	20-22kg/m, 40kg/m
Maximum speed	Most lines: 60km/h	30-40km/h, 30-50km/h
Maximum axle load	Most lines: 16.5 tons	15 tons
Maximum train load	440 – 1,900 tons	
<b>Newly constructed line</b>		
Minimum radius	600 metres	
Maximum grades	1:66	
Rail weight	48kg/m	
Maximum speed	100km/h	
Maximum axle load	18.5 tons	
Maximum train load	1,900 tons	

Source: Namibia Integrated Transport Master Plan

### 6.5.2.3 Current condition of railway

The current condition of the railway network is indicated in Figure 6.15 and Table 6.60. The section between Tsumeb and Oshikango is a new railway line constructed from 2004 to 2011, and trains are currently operated at around 100 km/h. However, other lines had been constructed more than 20 years ago, and facilities such as rail, sleeper and ballast of these lines are very old. The maximum speed of trains such as 15 km/h and 40 km/h is set at several sections.



Source: Directorate of Railways, Ministry of Works and Transport

**Figure 6.16: Current condition of railway network**

**Table 6.60: Condition of the current railway network**

No	Section	Distance (km)	Re-laid or Built Year	Rail (kg/m)	Sleeper	Ballast	Maximum speed of train
<b>Core Trunk Line: RSA Border – Walvis Way via Windhoek and Kranzberg, 1,286.709 km</b>							
T1	RSA Border	196.705	1972 – 1986	30 & 48	STS=30kg	Ballast	Total 866km 30km/h: 22km 40km/h: 108km 60km/h: 736km
T2	Grabwasser	50.917	1970	48	STS & CS	Ballast	
T3	Holoog	66.561	1950 – 1960	30	STS=40kg	Ballast	
T4	Seeheim Noord	229.468	1958 – 1984	48	STS & CS	Ballast	
T5	Falkenhorst	31.059	1964 – 1979	30	STS=40kg	Ballast	
	Ebeneerde						

No	Section	Distance (km)	Re-laid or Built Year	Rail (kg/m)	Sleeper	Ballast	Maximum speed of train
T6	Rehoboth	194.171	1970 – 1990	48 & 57	STS=40kg & CS	Ballast	
T7		97.271	1973 & 2011	48 & 50	STS=40kg & CS	Ballast	
T8	Windhoek	30.345	1966 – 1995	30 & 40	STS= 30 & 40kg	Ballast	15km/h: 3km 40km/h: 35km 60km/h: 382km Total 420km
T9	Otjihajavara	134.339	1969 – 1995	48	STS=30kg	Ballast	
	Albrechts	56.793	1958 – 1994	30 & 40	STS=30kg	Ballast	
T10	Usakos	199.080	1980 – 1993	48	STS & CS	Ballast	
	Walvis Bay						
<b>North Line: Kranzberg – Oshikango via Otjiwarongo, Otavi, Tsumeb and Ondangua, 702.107 km</b>							
N1	Kranzberg	391.627	1960 – 1986	30	STS=30kg	Ballast	15km/h: 31km 20km/h: 56km 40km/h: 304km
	Tsumeb	Under rehabilitation works (maximum speed of 40km/h)					
N2	King Nehale	252.500	2004 – 2006	48	CS	Ballast	100km/h Total 310km
N3		Oshikango	57.980	2011	48	CS	
<b>North-east Line: Otavi – Grootfontein, 90.528km</b>							
Ne1	Otavi	90.528	1960	30	STS=30kg	No Ballast	40km/h: 90km
	Grootfontein						
<b>Branches</b>							
<b>(1) Seeheim Noord – Lüderitz Branch: 318.361km</b>							
Ba1	Seeheim Noord	179.267	1970 – 1974	30	STS= 30 & 40kg	Ballast	15km/h: 40km 100km/h: 139km
	Aus						
Ba2	Lüderitz	139.094	The construction work between Aus and the border of Lüderitz Town completed in November 2014. The section between the border and Lüderitz port will be completed in 2015.				
<b>(2) Windhoek – Gobabis Branch: 225.405km</b>							
Bb1	Gamams	67.528	1970 – 1994	30	STS	No Ballast	40km/h: 225km
	Seeis	107.149	1928 – 1966	30	STS=30kg	No Ballast	
Bb2	Witvlei						
Bb3	Gobabis	50.730	1957 – 1961				
<b>(3) Otjiwarongo – Outjo Branch: presently not operational.</b>							

Note: STS means steel ties sleeper.

Source: Directorate of Railways of Ministry of Works and Transport

## 6.5.3 Rolling stock

### 6.5.3.1 Locomotives

TransNamib prepares 2 business development plans. The first one is a Strategic Business Plan 2014/15 - 2018/19, which is a mid- and long-term business development strategy, and the other one is a short-term recovery programme titled “180-days turnaround program”. According to the Strategic Business Plan, TransNamib owns 71 locomotives but the number of operative locomotives is only 37 units. TransNamib is planning to repair 25 of locomotives, and increase the number of operational locomotives to 62, which is the minimum requirement to implementing the Strategic Business Plan.

According to the 180-days turnaround programme, TransNamib is planning to rehabilitate 12 locomotives during the programme period.





Source: JICA Study Team

**Photo 6.7: Diesel locomotives**

### 6.5.3.2 Wagons

TransNamib has 1,667 wagons with an average age of 31 years. More than 100 wagons are over 40 years old. The number of wagon cars by type and age is shown in Table 6.61.

**Table 6.61: TransNamib's wagon cars by type and age**

Wagon type	Quantity	Age	Kind of transport cargo	Quantity	Age
Ballast	114	32 years	Container	2	31 years
General goods	182	35 years	Container	2	31 years
General goods	6	34 years	Oil	7	32 years
General goods	293	39 years	Oil	23	32 years
General goods	152	5 years	Oil	21	47 years
Grain	82	38 years	Oil	173	38 years
Grain	73	46 years	Oil	24	33 years
Grain	1	46 years	Oil	30	8 years
Grain	2	55 years	Oil	30	8 years
Livestock	1	55 years	Acid	25	5 years
Livestock	91	39 years	Acid	1	40 years
Frozen products	20	35 years	Water	3	60 years
Container	7	18 years	Water	2	32 years
Container	47	18 years	Abnormal loads	1	42 years
Container	146	35 years	Explosives	2	30 years
Container	65	21 years	Rail	36	34 years
Container	2	31 years	Wheels	3	70 years
Total	-	-	-	1,667	-

Source: Technical Assistance for the Namibia Integrated Transport Master Plan

According to TransNamib, some business opportunities have been lost due to the physical condition of wagons and the lack of suitable wagons or to the bad condition of existing tankers. Some wagons are being scrapped due to their age and the absence of a market (for example, reefer wagons). Recently, 100 open-top wagons have been purchased at a cost of 66,000 US dollars per unit, in order to replace the old ageing fleet.



Source: JICA Study Team

**Photo 6.8: Wagon cars: oil wagon (left) and container wagon (right)**

### 6.5.3.3 Coaches

According to the “Namibia Integrated Transport Master Plan”, the number of coaches is 138 units, of which 88 need to be rehabilitated or are under rehabilitation. There are only 40 coaches in operation. The average age of the fleet is around 40 years. There used to be four types of passenger services; Starliner, Desert express, Omugulu Gwombashe Star and Shongololo.

Only the Starliner service (9-seater of which 2 under rehabilitation) is for usual rail passenger services. It provides 16 business class seats and 56 economy class seats per coach. The Desert Express service (7 coaches) is for luxury touristic services. The operation of Omugulu Gwombashe Star service (3 coaches) has been terminated because of frequent technical problems and is being used for short distances only as a charter train. The Shongololo service (13 coaches) is used only for charter trains.

### 6.5.3.4 TransNamib’s rolling stock master plan

TransNamib has prepared a middle-term expansion and upgrading plan for its rolling stock to reflect the GRN’s middle-term expenditure framework of the national budget. Requirements of the rolling stock are based on market demand for the next few years that was researched by TransNamib. Table 6.62 shows an outline of the TransNamib Rolling Stock Master Plan.

**Table 6.62: TransNamib’s rolling stock master plan**

Description	Period	Quantity
Main line locomotives	2014-2016	10 units per annum (total 30)
	2016/17	10 units depending on demand and TKR
Shunting locomotives	2013/14	10 units
Fuel tankers	2014-2017	300 tankers over a 3 year period
Open top wagons	2014-2017	500 wagons over a 3 year period
Flat deck container wagons	2014-2017	300 wagons over a 3 year period
Bulk cement tankers	2013/14	25 tankers
Commuter Train Sets	2014-2017	4 Train sets for the Windhoek – Rehoboth/Okahandja/HK Airport routes
Train Control System (GPS based)	2014-2015	To be installed in phases

Source: Diagnostic and Scoping Survey for the Namibia Spatial Development Initiatives Program Draft Corridor Master Plan, aurecon, March 2014

## 6.5.4 Railway traffic

### 6.5.4.1 Freight

Over the last five years (FY 2007/08 to 2011/12), the freight traffic has steadily and slowly decreased from 2.6 million tons per year to 2.3 million tons per year. The major components of the freight traffic volume in FY 2011/12 are:

- 800,000 tons of bulk liquid (petroleum products unloaded at Walvis Bay) which occupies 34% of the total traffic volume,
- 775,000 tons of mining products which occupies 33% of the total traffic volume,
- 275,000 tons of construction material which occupies 12% of the total traffic volume
- Agricultural and containers that occupy 8% each of the total traffic volume.

Container traffic has significantly increased in 2011/12. This is due to container transport of manganese ore from Otjosundu mine for export (100,000 tons per annum).

The other major mining products are:

- 220,000 tons of copper concentrate unloaded at Walvis Bay Port, which is transported to Dundee Smelter in Tsumeb,
- 100,000 tons of zinc concentrate from Exxaro mine at Rosh Pinah to Walvis Bay. Exxaro is planning to export its production from Lüderitz Port.
- 100,000 tons of fluorspar from Otjiwarongo to Walvis Bay<sup>5</sup>.
- 55,000 tons of coal from Walvis Bay Port to Ohorongo Cement and Dundee Smelter.

**Table 6.63: Freight traffic (2007/08 – 2011/12)**

Kind of cargos	Unit: 000 tons				
	2007/08	2008/09	2009/10	2010/11	2011/12
Liquid bulk	840	813	765	806	797
	33%	32%	31%	34%	34%
Mining	700	754	796	790	775
	27%	30%	32%	33%	33%
Construction	594	550	541	417	275
	23%	22%	22%	17%	12%
Agriculture	207	222	192	180	181
	8%	9%	8%	8%	8%
Containers	168	144	109	143	276
	6%	6%	4%	6%	12%
Others	74	64	47	59	41
	3%	1%	3%	2%	1%
Total	2,583	2,547	2,450	2,395	2,345

Source: Namibia Integrated Transport Master Plan

<sup>5</sup> Okorusu mine in Otjiwarongo has stopped operation in November 2014 because the viable higher grade ore resources were depleted. However, the mine could partially resume mining operations in February 2015 if studies to determine commercial viability of a new ore body are completed.

### 6.5.4.2 Passenger service

Sleeper type passenger train services used to be operated between Namibia and South Africa and in Namibia in the past. These services were terminated during the early 1990s due to declining profitability of the service, since the number of rail passengers has been declining. In 1994, TransNamib introduced the sitter class Starline. Passenger numbers started to increase from 45,000 in 1994 to 153,500 in 2000. There was, however, a decline in passengers again since 2000, and the number of passengers in 2010 was only about 60,000.

There are many reasons for the decline of passengers. Firstly, scheduled operation of railcars is becoming difficult due to aging of the railway facility and rolling stock. Secondly, passengers prefer long-distance midi-buses which provide more comfort, speed and flexibility over rail. Termination of the passenger service from Walvis Bay to Tsumeb due to poor rail track conditions is also one of reasons for the decline in the number of passengers.

### 6.5.5 Train operation

#### 6.5.5.1 Freight trains

Currently, two types of freight trains are operated.

- Goods (freight or fast freight), and
- Mixed (freight and passengers) where coaches are attached to a freight train to reduce operating costs.

TransNamib also introduced road transportation and loading/unloading services in order to provide door-to-door services for both passengers and goods.

There are approximately 50 regular trains running on the railway network, with different frequencies, two thirds of them being on a daily basis, the remaining one third being on a bi-weekly basis.



Source: JICA Study Team

**Photo 6.9: Operation of cargo trains: around Dune 7 (left) and Tsumeb Station (right)**

### 6.5.5.2 Passenger trains

As of January 2014, passenger trains are operated on 5 different routes with the following frequencies:

- Windhoek - Walvis Bay - Windhoek: every day except Saturday,
- Windhoek - Keetmanshoop: every day except Saturday,
- Keetmanshoop - Karasburg: twice a week,
- Tsumeb – Ondangwa: every day, and
- Ondangwa - Oshikango: every day except Sunday.

Passenger trains have 2 to 6 coaches attached to a freight train. Every passenger train is connected to a regular freight train.

All services to the north (Tsumeb) and the east (Gobabis) have been interrupted due to the poor conditions of the line resulting in safety issues.

**Table 6.64: Operation schedule of passenger trains**

Route	Station	Frequency	Travel time
Windhoek - Walvis Bay - Windhoek	Windhoek, Okahandja, Karibib, Kranzberg, Usakos, Arandis, Swakopmund, Kuiseb, Walvis Bay	Daily except Saturday	11 hours
Windhoek – Keetmanshoop	Windhoek, Rehoboth, Kalkrand, Mariental, Gibeon, Asab, Tses, Keetmanshoop	Daily except Saturday	11 hours
Keetmanshoop - Karasburg	Keetmanshoop, Grunaü, Karasburg	Wed. and Sat.	5.5 hours
Tsumeb - Ondangwa	Tsumeb, Dr. Moses Amweelo, Oshivelo, Cham Cham, Omuthiya, Ngwali ya Shiimbi, KingShikongo sha Kalulu, Ondangwa	Daily	5.5 hours
Ondangwa - Oshikango	Ondangwa, Col: Simon Mzee Kaukungwa, Augustus “McNamara” Nghaamwa, Oshikango	Daily except Sunday	1.5 hours

Source: Timetable of Starline issued by TransNamib Holdings Ltd. (effective 30 Nov. 2012 till 31 Jan. 2014)

### 6.5.6 Safety

Due to the poor condition of the railway network, derailments occur frequently. In the 4<sup>th</sup> quarter of 2011, 5 derailments occurred on the line from Kranzberg to Tsumeb, which is in the most critical condition. This is the main reason why passenger traffic has been stopped on this line in several years ago.

The Safety Board has been set up within TransNamib. Most technical managers within the engineering division are also members of the Safety Board. The Safety Board reviews main safety problems and proposes solutions such as repair work. Departments relevant to safety within TransNamib are more involved with issues related to ergonomics, employee’s health and safety or training aspects.

## **6.5.7 Maintenance**

### **6.5.7.1 Infrastructure (tracks)**

Although the rail infrastructure such as tracks belongs to the GRN, maintenance of the infrastructure is financed and carried out by TransNamib. Other than that, TransNamib does not have to pay a user charge to the GRN.

Organization for maintenance is divided into 2 regions – North and Central region, and South region. Each region performs the following 3 activities – Permanent way, Buildings, and Bridges and Tamping.

It is said that the maintenance department does not have enough staff, in particular, considering the current condition of the railway network. In addition, this department suffers from a lack of:

- Appropriate management systems for maintenance,
- Adequate technical and management training, and
- Modern and efficient maintenance tools and machines.

It is also said that investment in the fields of Maintenance Management System (MMS), technical and management training and maintenance equipment is need.

### **6.5.7.2 Rolling stock**

Maintenance of the rolling stock (locomotives, coaches and wagons) is mainly carried out at TransNamib's Windhoek workshop. There are two rolling stock maintenance departments, namely Locomotives, and Carriages and Wagons.

The maintenance workshops are under-equipped and additional equipment, tools and spare parts are required. In addition, there is a lack of a specialized computer based management tool for efficiently managing and monitoring the maintenance activities.

## **6.5.8 Financial condition**

TransNamib's financial resources come from the transport tariffs. No compensation is paid by GRN. GRN pays for the investment costs corresponding to the construction of new lines and major rehabilitation and/or improvement of existing lines, including the sleeper replacement program (steel sleepers replaced with concrete sleepers).

Table 6.65 and Table 6.66 indicate statement of comprehensive income and statement of financial position in the end of financial years, respectively. TransNamib made a profit of N\$36 million in 2010/11 but put out losses after that year. Amount of the comprehensive loss had been increasing

from N\$85 million in 2011/12 to N\$147 million in 2013/14. Annual revenues have a trend of decrease from N\$583 million to N\$527 million in 2013/14 while operating expense has been increasing from N\$387 million in 2010/11 to N\$522 million in 2013/14.

**Table 6.65: Statement of comprehensive income**

Unit: N\$ 000				
Item	2010/11	2011/12	2012/13	2013/14
Revenue	582,713	551,550	565,318	527,113
Cost of sales and operations	(176,095)	(179,880)	(210,673)	(215,764)
<b>Gross profit</b>	<b>406,618</b>	<b>371,670</b>	<b>354,645</b>	<b>311,349</b>
Other income	7,197	8,724	26,173	27,810
Operating expenses	(396,985)	(435,402)	(474,102)	(522,150)
Adjustment of government loan	–	–	32,731	–
<b>Operating (loss) profit</b>	<b>16,830</b>	<b>(55,008)</b>	<b>(60,533)</b>	<b>(182,991)</b>
Financial costs, etc.	60,436	(18,898)	(6,702)	(261)
<b>(Loss) profit before taxation</b>	<b>77,266</b>	<b>(73,906)</b>	<b>(67,255)</b>	<b>(183,252)</b>
Income tax expense	(40,908)	–	–	–
<b>(Loss) profit for the year</b>	<b>36,358</b>	<b>(73,906)</b>	<b>(67,255)</b>	<b>(183,252)</b>
Other comprehensive income	(427)	(10,795)	(47,497)	(10,795)
<b>Total comprehensive loss for the year</b>	<b>35,931</b>	<b>(84,701)</b>	<b>(114,752)</b>	<b>(147,047)</b>

Source: TransNamib Annual Report 2011, 2012 and 2013

**Table 6.66: Statement of financial position in the end of financial years**

Unit: N\$ 000				
Item	2010/11	2011/12	2012/13	2013/14
Non-current assets	834,594	829,370	837,741	901,869
Current assets	237,917	385,389	323,983	276,762
<b>Total assets</b>	<b>1,072,511</b>	<b>1,214,759</b>	<b>1,161,724</b>	<b>1,178,631</b>
Equity	407,883	333,977	230,020	46,768
Non-current liabilities	454,652	595,348	585,415	627,662
Current liabilities	209,976	285,434	346,289	504,201
<b>Total liabilities</b>	<b>664,628</b>	<b>880,782</b>	<b>931,704</b>	<b>1,131,863</b>
<b>Total equity and liabilities</b>	<b>1,072,511</b>	<b>1,214,759</b>	<b>1,161,724</b>	<b>1,178,631</b>

Source: TransNamib Annual Report 2011, 2012 and 2013

Regarding to the balance sheet, Equity has decreased from N\$408 million in 2010/11 to N\$47 million in 2013/14 due to accumulated loss. On the other hand, total liability has increased 1.7 fold in 4 years.

### 6.5.9 On-going and planned projects

TransNamib's on-going and planned projects are listed in Table 6.67.

**Table 6.67: List of on-going and planned projects**

Projects	Outline and status
<b>On-going projects</b>	
Extension from Ondangwa up to Oshikango	Construction has been inaugurated in July 2012, and trains are being operated already at present.
Reconstruction of the Lüderitz branch	Reconstruction works between Aus and the border of Lüderitz has already completed in November 2014. The section between the border and Lüderitz port will be constructed in 2015.
Rehabilitation of North Line	Rehabilitation works of North Line (Kranzberg – Tsumeb) is given the first priority and is being implemented. After completion, train will be able to operate at maximum speed of 40km/h.
<b>Planned projects</b>	
Trans – Kalahari Railway	Rail line stops at Gobabis about 150km before the border of Botswana. The feasibility study for



Projects	Outline and status
	<p>construction of a new rail line has already been completed. This line is essentially for connecting the huge coalfields discovered in eastern Botswana with Walvis Bay Port. The preferred rail alignment that the consultant recommended goes directly from Botswana to Mariental in Namibia (around 230km south of Windhoek on the main north – south existing railway line), not connecting to the existing line in Gobabis.</p> <p>The Namibian and Botswana governments concluded the MOU on development of this railway line in February 2014.</p>
Trans – Caprivi/ railway to the Northern Port	<p>A feasibility study for the construction of new rail line aimed to connecting Katima Mulilo at the border with Zambia to Cape Fria where the construction of a new port is envisaged has been carried out in 2010. At the feasibility level, two alternatives have been studied. None of these two options were estimated to be economically viable.</p>

Source: Namibia Integrated Transport Master Plan

Rehabilitation of the North Line (Kranzberg–Tsumeb) is very important not only for improvement and strengthening of corridors (Trans–Caprivi and Trans–Cunene) but also for achieving the Desired Outcome (DO) mentioned in the NDP4 that “by 2017, rail-transported cargo is double that of 2012”. However, no improvement or upgrading plan/works of the section between Windhoek and Walvis Bay (around 420km) was made and implemented. Track condition of the section remains as it is. There is a critical section (3 km length of maximum speed of 15 km/hour) for train operation within the section. Steel sleepers have still been used at the length of more than 200km on this section. At present, it takes about 11 hours for the operation of the section. Present average operation speed is about 38 km/hour. Once this section is improved, operation speed will be increased and present operation time of 11 hours will be reduced.

#### 6.5.10 Issues on railway development

TransNamib’s cargo transport volume was 2.4 million tons in 2010/11 and 2.3 million tons in 2011/12. TransNamib set a goal to double rail transport cargo by 2017 to achieve the Desired Outcome of NDP4. In order to achieve this goal, TransNamib needs to meet the freight cargo demand by Ohorongo Cement and Dundee Custom Smelter first. After addressing the demand, it is necessary to make efforts to transport transit cargo. Once TransNamib has a significant role in cargo transport, the over-concentration on road traffic will be mitigated.

TransNamib needs to address the following issues.

- Rehabilitation and/or upgrading of railway lines: Some core sections of the existing network such as the section between Windhoek and Walvis Bay (around 420km) are in a critical condition. However, 306 kilometres of new lines have been built in the northern part of the country.
- Replacing aged rolling stock: 80% of the fifty-nine locomotives in operation are more than forty years old, and the average age of wagons is 32 years. Almost half of the locomotives have been purchased from China recently; however, they are already often out of operation.
- Improvement of service level: In particular, operation speed, frequency, axle load, reliability, and safety

## **6.6 Aviation development in Namibia**

The Air Transport system in Namibia is under the responsibility of the Directorate of Civil Aviation (DCA), in the Ministry of Works and Transport. Other main actors of the Namibian air transport system are Namibia Airports Company (NAC) and Air Namibia.

### **6.6.1 Directorate of Civil Aviation (DAC)**

#### **6.6.1.1 Responsibility and functions**

DCA is the regulatory body for civil aviation, and its responsibility is to assure a safe, secure and efficient civil aviation system that contributes to Namibia's national economy by fostering the planning and development of air transport. Its core functions are:

- Issuing licenses to aviation personnel and aerodromes,
- Ensuring aviation safety and security,
- Providing and maintaining air traffic services,
- Maintaining air navigation and other technical facilities, and
- Provide aeronautical information services.

The organization for investigation of aircraft accidents is separated from DCA to ensure independent investigation and the Aircraft Accident/Incident Investigator reports directly to MWT.

#### **6.6.1.2 Organization**

DCA consists of 3 divisions: Aviation, Administration and Navigation Division, Flight Safety and Security Division, and Meteorological Services Division. DCA's designated number of official staff is 140. However, only 53 positions are currently filled. DCA faces a shortage of qualified and trained staff capable of effectively overseeing aviation activities in Namibia.

#### **Civil aviation activities**

Actors in Namibian civil aviation consists of 25 airline operator certificate holders, 42 approved maintenance organizations (12 in Namibia, 1 in Botswana, 2 in the Middle East, 1 in Morocco, 2 in North America, 4 in Europe, 20 in South Africa), 490 registered aircraft, 240 active pilot licenses, and 23 registered airports.

#### **Air navigation services**

DCA is responsible for air navigation services (air traffic control) as well as aeronautical activities in Namibia. The number of flights controlled within the Namibian Flight Information Region (FIR)

gradually reduced from 73,400 in 2007 to 61,400 in 2011.

**Table 6.68: DAC air traffic control activity**

Kind of flights	No of flights in Namibian FIR				
	2007	2008	2009	2010	2011
Departing flights	33,297	32,423	28,483	26,714	26,620
Arriving flights	33,366	32,417	28,450	26,728	27,347
Transit	6,716	6,998	6,163	6,442	7,393
Total	73,376	71,838	63,096	59,884	61,360

Source: Namibia Integrated Transport Master Plan

### 6.6.1.3 Finance

DCA's major revenue comes from air navigation services. According to DCA, the total revenue amounted to N\$45 million in FY 2008/2009 and N\$55 million in FY 2009/2010, respectively. Revenues from issuance of licenses, certificates, inspections, etc. are limited, with on average N\$0.5 million per annum.

DCA's annual current expenditures amount to about N\$74 million. It is broken down as: N\$30 million for personnel expense, N\$20 million for operation and \$24 million for consultancy Fees to ICAO. The deficit between the revenue and the expenditure is covered by the GRN.

### 6.6.1.4 Investment projects

DCA's main projects in the short-term and medium-term are shown in Table 6.69.

**Table 6.69: DAC's projects by period**

Period	Project
Short-term (0 to 3 years)	<ul style="list-style-type: none"> <li>- Set up of the Namibian Civil Aviation Authority.</li> <li>- Recruitment and training of qualified and skilled Namibian personnel.</li> <li>- Development of a new set of modern aviation regulations accompanied with guidance material,</li> <li>- Provision for a centralized information system for dealing with the register, licenses, certificates, etc.</li> <li>- ATC equipment for the Control Tower of Katima Mulilo airport.</li> </ul>
Medium-term (3 to 8 years)	<ul style="list-style-type: none"> <li>- Construction of New Headquarters (estimated cost: N\$80 million).</li> <li>- Construction of new ATC control Tower in Ondangwa, Swakopmund and Walvis Bay (estimated costs: 7 million N\$ each).</li> <li>- Construction of new AIS offices with new AIS system and an ATC simulator in the future Maritime Control Centre at Eros airport near the ACC.</li> <li>- Construction of a new ATC Tower in HKIA.</li> </ul>

Source: Namibia Integrated Transport Master Plan

## 6.6.2 Namibian Airports Company (NAC)

### 6.6.2.1 Airports in Namibia

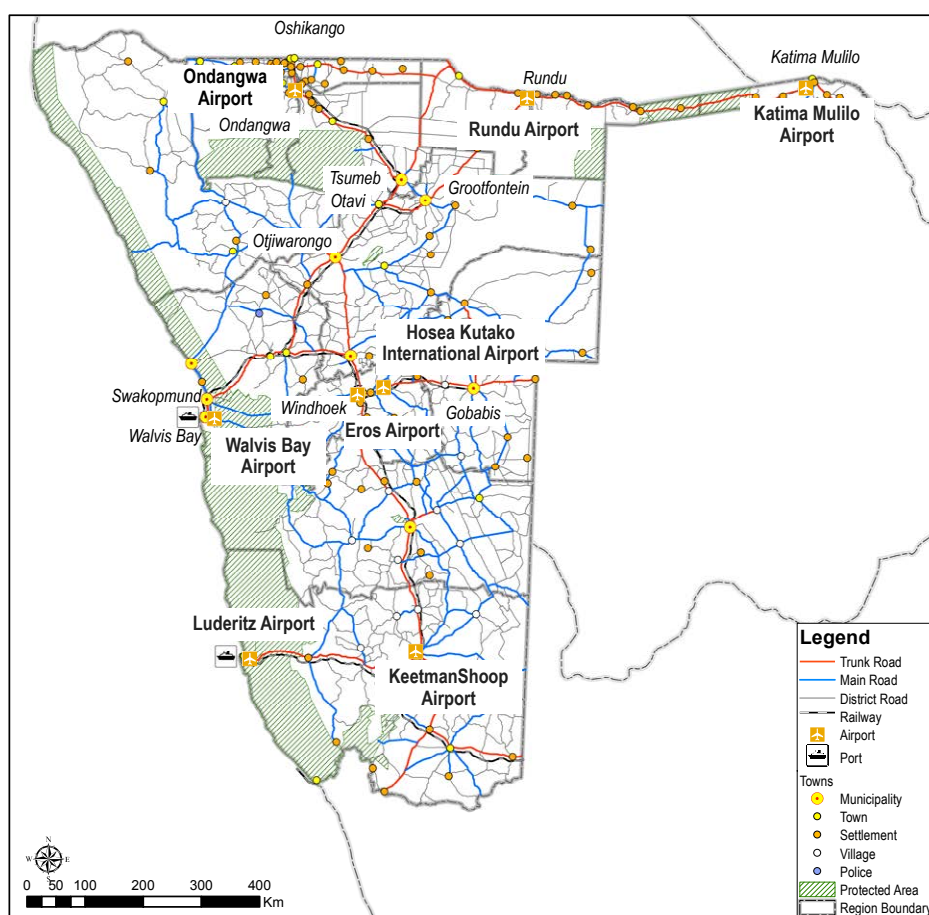
There are approximately 400 airstrips in Namibia. Of the 400 airstrips, 8 airports are managed by NAC. Those are Hosea Kutako International Airport (HKIA), Eros Airport, Walvis Bay Airport, Keetmanshoop airport, Lüderitz Airport, Katima Mulilo Airport, Ondangwa Airport, and Rundu Airport.

Airports that are not managed and operated by NAC are owned by municipalities, regional governments and/or the private sector. Table 6.70 shows airports, connected cities and number of passenger traffic, and Figure 6.17 shows location of the 8 airports. The current situation of 8 airports is described in this section.

**Table 6.70: Connections and no of passengers by airports in 2011/12 and 2012/13**

Airports	Connected cities	No of passengers	
		2011/12	2012/13
HKIA	Frankfurt, Munich and London, Johannesburg and Cape Town, Luanda, Accra, Gaborone and Maun, Victoria Falls, Lusaka	772,091	802,811
Eros	Domestic (Ondangwa, Rundu and Katima Mulilo), regional and international traffic	78,089	91,071
Walvis Bay	Johannesburg, Cape Town, HKIA and Eros, non-scheduled international flights	88,021	88,614
Keetmanshoop	No regular flight	2,098	2,158
Lüderitz	Windhoek, Oranjemund	3,903	6,184
Katima Mulilo	Eros Airport, Rundu	8,437	14,917
Ondangwa	Eros Airport, regional, international for refuelling	36,617	41,099
Rundu	Eros Airport, Katima Mulilo	6,435	6,374
Total		995,691	1,053,228

Source: Annual Report of NAC (2012/13)



Source: Namibia Integrated Transport Master Plan

**Figure 6.17: Airports managed and operated by NAC**

### 6.6.2.2 Business operation of NAC

Namibia Airports Company (NAC) is a State Owned Enterprise (SOE) fully owned by the GRN. NAC is legally and financially autonomous and operates under commercial principles. The Minister of Works and Transport has been designated as the portfolio Minister.

The mission of NAC is to develop, manage and operate the main Namibian airports on sound business principles with considerations to the interest of its stakeholders. The major objectives of NAC are to ensure:

- The arrival, surface movement, parking or departure of aircraft,
- The servicing of aircraft, including the supply of fuel and lubricants, and
- Ground handling of aircraft, passengers, baggage and cargo.

The operation of NAC is managed and controlled by the Board of Directors. The directors are appointed by the Minister and serve the board as non-executive directors. The day-to-day operation of NAC is managed by Corporate Management, which comprises the Chief Executive Officer and the heads of departments. NAC has the following five departments:

- Operations and Engineering,
- Finance, Administration and Information technology,
- Commercial Services,
- Human Capital Development, and
- Corporate and Legal Services.

### 6.6.2.3 Outline of current operation and facilities

Outline of the current airport operation and facilities managed by NAC is shown in Table 6.71

**Table 6.71: Outline of the current airport and facilities**

Airports	Operations	Facilities
HKIA	<ul style="list-style-type: none"> <li>- Operations 24 hours a day</li> <li>- Weekly non-stop flights to Frankfurt, Munich and London</li> <li>- Daily connections to Johannesburg and Cape Town</li> <li>- Routes to Luanda, Accra, Gaborone and Maun, Victoria Falls, Lusaka</li> </ul>	<ul style="list-style-type: none"> <li>- 4,673 m-long and 45 m-wide runway</li> <li>- 1,524 m-long and 30 m-wide runway</li> <li>- Rescue and fire fighting services terminal building having approximately 8,240 m<sup>2</sup> floor area</li> </ul>
Walvis Bay	<ul style="list-style-type: none"> <li>- Expansion of runway and taxiway and a terminal building and installation of ILS is now being implemented for becoming the second international airport in Namibia.</li> </ul>	2,134 m-long and 30 m-wide runway
Eros	<ul style="list-style-type: none"> <li>- Operations 24 hours a day</li> <li>- Rescue and fire fighting services</li> </ul>	<ul style="list-style-type: none"> <li>- 2,250 m-long and 30 m-wide runway</li> <li>- 1,005 m-long and 30 m-wide runway</li> </ul>
Keetmanshoop	<ul style="list-style-type: none"> <li>- Used to serve as alternate airport to HKIA</li> <li>- The Namibia Aviation Training Academy (NATA) is located</li> <li>- No regular flight</li> </ul>	<ul style="list-style-type: none"> <li>- 2,316 m-long and 30 m-wide runway</li> <li>- 1,434 m-long and 30 m-wide runway</li> <li>- Terminal building</li> <li>- Air Traffic Control (ATC) tower</li> </ul>

Airports	Operations	Facilities
Lüderitz	<ul style="list-style-type: none"> <li>- A terminal recently expanded</li> <li>- An approach and runway lighting system enabling night operations</li> <li>- Route to Windhoek, Oranjemund</li> </ul>	<ul style="list-style-type: none"> <li>- 1,830 m-long and 30 m-wide runway</li> <li>- 1,193 m-long and 30 m-wide runway</li> <li>- An approach and runway -lighting system</li> <li>- No ATC service</li> </ul>
Katima Mulilo	<ul style="list-style-type: none"> <li>- Runway and taxiways are in poor condition and need major rehabilitation.</li> <li>- Route to Eros Airport, Rundu</li> </ul>	<ul style="list-style-type: none"> <li>- 2,992 m-long and 30m-wide runway</li> <li>- ATC service</li> </ul>
Ondangwa	<ul style="list-style-type: none"> <li>- A runway and the taxiways are in poor condition and need rehabilitation.</li> <li>- Regional and international flight for refuelling</li> <li>- Route to Eros</li> </ul>	<ul style="list-style-type: none"> <li>- 2,987 m-long and 30 m-wide -runway</li> <li>- ATC tower</li> </ul>
Rundu	<ul style="list-style-type: none"> <li>- A main runway is relatively fair condition.</li> <li>- Necessity to improve of ground marking and the firefighting facilities</li> <li>- Route to Eros and Katima Mulilo</li> </ul>	<ul style="list-style-type: none"> <li>- 3,354 m-long and 30 m-wide runway</li> <li>- 1,465 m-long and 30 m-wide runway</li> <li>- No ATC tower</li> <li>- Excellent storage facilities for outbound cargo to Angola construction and retail materials</li> </ul>

Source: Namibia Integrated Transport Master Plan

Except Lüderitz Airport, all other 7 airports have a runway which is more than 2,000 metres long, and medium-sized jet planes can use these airports. The runway at Walvis Bay Airport is being expanded as of January 2015.

### 6.6.3 Traffic and movement

#### 6.6.3.1 Passenger traffic

The total number of arrival and departure passengers who used the 8 airports managed and operated by NAC in years 2011/12 and 2012/13 is shown in Table 6.72.

The airports were used by 995,691 and 1,053,228 in 2011/12 and 2012/13 respectively. Regional and international passengers accounted for about 80% of the total. The total number of passengers in 2012/13 increased by 5.8% compared to the passengers in 2011/12. However, number of domestic passengers grew by 18.1% in 2012/13 from the year before.

**Table 6.72: Recent passenger traffic at airports operated by NAC**

Year	Domestic	Regional	International	Total
2011/12	193,876 (19.5%)	343,371 (34.5%)	458,444 (46.0%)	995,691
2012/13	228,919 (21.7%) (+18.1%)	345,876 (32.8%) (+0.7%)	478,433 (45.4%) (+4.4%)	1,053,228 (+5.8%)

Source: Annual Report of NAC (2012/13).

### HKIA

The number of arrival and departure passengers passing through HKIA increased year by year. The number of passengers in 2012/13 grew by 61.7% from 2003/04.

In FY 2012/13, the number of passengers passing through HKIA was around 800,000. Out of 800,000 passengers, 750,000 passengers were travelling on international or regional flights. According to NAC's classification, regional passengers are those travelling to/from neighbouring

countries in Southern Africa including passengers connecting at other airports in the region. In FY 2012/13, the number of passengers at HKIA represented 76.2% of the total passengers (1,053,228) of the Namibian airports, 80.8% of the regional passengers and 99.5% of the international passengers, respectively.

**Table 6.73: Number of passengers at HKIA**

Unit: persons

Year	Domestic	Regional	International	Total
2003/04	7,799	145,015	344,097	496,411
2004/05	10,148	166,792	347,267	524,477
2005/06	14,163	189,182	370,884	574,229
2006/07	17,539	225,859	404,300	647,698
2007/08	20,523	250,732	437,863	709,118
2008/09	22,547	257,422	421,301	701,270
2009/10	31,926	247,284	407,410	686,620
2010/11	30,766	236,356	412,430	679,552
2011/12	46,980	268,991	456,120	772,091
2012/13	47,286	279,572	475,953	802,811

Source: Data between 2003/04 and 2010/11 were obtained from Namibia Integrated Transport Master Plan and data 2011/12 and 1012/13 were obtained from Annual Report of NAC.

### **Eros Airport**

The number of passenger passing through Eros Airport was around 70,000 to 80,000 during 2003/04 and 2004/05 but decreased in 60,000's in 2009/10 and 1010/11. In particular, the number of domestic and international passengers has increased significantly in recent years. On the other hand, the number of regional passengers was down by almost half in 2011/12 and 2012/13.

**Table 6.74: Number of passengers at Eros Airport**

Unit: persons

Year	Domestic	Regional	International	Total
2003/04	70,780	4,171	0	74,951
2004/05	69,118	4,634	0	73,752
2005/06	62,963	5,516	0	68,479
2006/07	71,049	4,477	0	75,526
2007/08	75,524	4,880	0	80,404
2008/09	72,037	5,298	0	77,335
2009/10	60,920	5,004	0	65,924
2010/11	59,084	4,382	208	63,674
2011/12	73,799	2,718	1,572	78,089
2012/13	86,809	2,611	1,651	91,071

Source: Data between 2003/04 and 2010/11 were obtained from Namibia Integrated Transport Master Plan and data 2011/12 and 1012/13 were obtained from Annual Report of NAC.

### **Walvis Bay**

The number of passengers passing through Walvis Bay Airport increased steadily during the last 5 years. In FY 2003/04, the number of passengers passing through Walvis Bay Airport was around 69,500. In FY 2012/13, the number increased to about 88,600. Especially the number of domestic and international passengers shows a significant increase. In 2012/13, about 70% of the total is regional passengers, and 30% is domestic and international passengers.



**Table 6.75: Number of Passengers at Walvis Bay Airport**

Unit: persons

Year	Domestic	Regional	International	Total
2008/09	14,039	55,137	298	69,474
2009/10	13,767	61,480	223	75,470
2010/11	11,620	61,516	334	73,470
2011/12	17,551	70,140	330	88,021
2012/13	26,356	61,789	469	88,614

Source: Data between 2008/09 and 2010/11 were obtained from Namibia Integrated Transport Master Plan and data 2011/12 and 2012/13 were obtained from Annual Report of NAC.

### **Other Airports**

Table 6.76 shows the number of passengers passing through 5 airports (Keetmanshoop, Lüderitz, Katima Mulilo, Ondangwa, and Rundu) in 2011/12 and 2012/13.

The total number of the passengers who used these 5 airports was about 57,500 and 70,700 in 2011/12 and 2012/13 respectively. Out of 5 airports, the airport which the largest number of passengers passing through was Ondangwa airport. About 36,600 and 41,100 passengers used Ondangwa airport in the last 2 years. These accounted for around 60% of the total.

**Table 6.76: Number of passengers at other 5 airports**

Unit: persons

Year	Airport	Domestic	Regional	International	Total
2011/12	Keetmanshoop	1,496	602	0	2,098
	Lüderitz	3,794	109	0	3,903
	Katima Mulilo	8,039	297	101	8,437
	Ondangwa	35,927	385	305	36,617
	Rundu	6,290	129	16	6,435
	Total	55,546	1,522	422	57,490
2012/13	Keetmanshoop	1,617	541	0	2,158
	Lüderitz	6,127	57	0	6,184
	Katima Mulilo	13,786	1,028	103	14,917
	Ondangwa	40,664	211	224	41,099
	Rundu	6,274	67	33	6,374
	Total	68,468	1,904	360	70,732

Source: Annual Report of NAC (2012/13).

### **6.6.3.2 Movements (arrivals and departures)**

#### **Movements at airports operated by NAC**

Total number of plane movements and the number of passengers at 8 airports in year 2011/12 and 2012/13 are shown in Table 6.77.

Numbers of movements (arrivals and departures) were 57,584 in 2011/12 and 59,611 in 2012/13 respectively. The number of domestic planes accounted for more than about 80% of the total. The total number of planes in 2012/13 increased 3.5% compared to 2011/12. However, regional planes in 2012/13 decreased 7.4% from the year before.

The average number of passengers per plane was very few. This was especially accentuated in domestic planes. The average number of passengers per domestic plane in 2011/12 and 2012/13 was

4.8 and 5.3 respectively.

**Table 6.77: Movements and passengers at airports**

Unit: movement flights; passenger persons; passenger per plane persons

Year		Domestic	Regional	International	Total
2011/12	Movement	40,339	13,392	3,853	57,584
	Passenger	193,876	343,371	458,444	995,691
	Passenger per plane	4.8	25.6	119.0	17.3
2012/13	Movement	42,936 (+6.4%)	12,402 (-7.4%)	4,273 (+10.9%)	59,611 (+3.5%)
	Passenger	228,919	345,876	478,433	1,053,228
	Passenger per plane	5.3	27.9	112.0	17.7

Source: Annual Report of NAC (2012/13).

## **HKIA**

The total number of movements (both of arrivals and departures) of domestic, regional and international airplanes at HKIA has increased about 31% over 9 years from 13,061 in FY 2003/04 to 17,061 in FY 2012/13. The increase of movements in regional planes was especially significant. The movement of regional planes in 2012/13 showed a more than 3 fold increase compared to the movement in 2003/04.

HKIA is an international airport. Therefore, more than two thirds of airplanes using HKIA are from abroad. In FY 2012/13, flights from abroad (international and regional) accounted for about 67.1% of the total. Domestic flights accounted for about 32.9% of the total.

**Table 6.78: Movements and passengers at HKIA**

Unit: movement flights; passenger persons; passenger per plane persons

Year		Domestic	Regional	International	Total
2003/04	Movement	4,597	1,012	7,452	13,061
	Passenger	7,799	145,015	344,097	496,411
	Passenger per plane	1.7	143.3	46.2	38.0
2004/05	Movement	4,728	1,303	7,988	14,019
	Passenger	10,148	166,792	347,267	524,477
	Passenger per plane	2.1	128.0	43.5	37.4
2005/06	Movement	5,377	1,409	6,876	13,662
	Passenger	14,163	189,182	370,884	574,229
	Passenger per plane	2.6	134.3	53.9	42.0
2006/07	Movement	6,781	1,607	7,294	15,682
	Passenger	17,539	225,859	404,300	647,698
	Passenger per plane	2.6	140.5	55.4	41.3
2007/08	Movement	7,416	1,754	7,389	16,559
	Passenger	20,523	250,732	437,863	709,118
	Passenger per plane	2.8	142.9	59.3	42.8
2008/09	Movement	7,413	1,778	7,335	16,526
	Passenger	22,547	257,422	421,301	701,270
	Passenger per plane	3.0	144.8	57.4	42.4
2009/10	Movement	6,329	1,929	7,263	15,521
	Passenger	31,926	247,284	407,410	686,620
	Passenger per plane	5.0	128.2	56.1	44.2
2010/11	Movement	5,056	1,909	7,703	14,671
	Passenger	30,766	236,356	412,430	679,552
	Passenger per plane	6.1	123.8	53.5	46.3
2011/12	Movement	5,199	2,893	7,898	15,990

Year		Domestic	Regional	International	Total
	Passenger	46,980	268,991	456,120	772,091
	Passenger per plane	9.0	93.0	57.8	48.3
	2012/13	5,610	3,477	7,974	17,061
	Passenger	47,286	279,572	475,953	802,811
	Passenger per plane	8.4	80.4	59.7	47.1

Source: Data between 2003/04 and 2010/11 were obtained from Namibia Integrated Transport Master Plan and data 2011/12 and 1012/13 were obtained from Annual Report of NAC.

The average number of passengers per flight at HKIA increased by around 30 persons to around 40 persons between FY 2003/04 and FY 2012/13. The average number of passengers per international flight increased from around 40 persons to around 50 persons between FY 2003/04 and FY 2012/13. Though the average number of passengers per regional flight fluctuated between around 120 persons and around 140 persons till FY 2010/11, it dropped to around 80 persons in FY 2012/13. On the other hand, the average number of passengers per domestic flight fluctuated in the single digits. It is assumed that almost all domestic planes except planes operated by Air Namibia used HKIA were small aircraft.

### **Eros Airport**

The total number of movements at Eros Airport was always higher than the number at HKIA. In FY 2012/13, the total number of movements was about 28,100 flights, and 1.65 times bigger than HKIA. However, the number had decreased from 35,000 in FY 2007/08. More than 90% of the total movements were domestic flights. International flights started using Eros Airport from FY 2010/11 and the number of movements was increasing year after year. The number was 444 flights in FY 2012/13.

The average number of passengers per domestic, regional and international flight at Eros Airport fluctuated in the single digits. Air Namibia operates planes with around 30-seats for domestic flights at Eros Airport. However, it is assumed that almost all planes that used Eros Airport were small aircraft.

**Table 6.79: Movements and passengers at Eros Airport**

Unit: movement flights; passenger persons; passenger per plane persons					
Year		Domestic	Regional	International	Total
2003/04	Movement	21,097	3,199	0	24,296
	Passenger	70,780	4,171	0	74,951
	Passenger per plane	3.4	1.3	0	3.1
2004/05	Movement	20,291	3,111	0	23,402
	Passenger	69,118	4,634	0	73,752
	Passenger per plane	3.4	1.5	0	3.2
2005/06	Movement	23,698	2,892	0	26,590
	Passenger	62,963	5,516	0	68,479
	Passenger per plane	2.7	1.9	0	2.6
2006/07	Movement	30,871	2,805	0	33,676
	Passenger	71,049	4,477	0	75,526
	Passenger per plane	2.3	1.6	0	2.2
2007/08	Movement	32,653	2,837	0	35,490
	Passenger	75,524	4,880	0	80,404
	Passenger per plane	2.3	1.7	0	2.3
2008/09	Movement	30,298	2,705	0	33,003

Year		Domestic	Regional	International	Total
	Passenger	72,037	5,298	0	77,335
	Passenger per plane	2.4	2.0	0	2.3
2009/10	Movement	27,076	2,512	0	29,588
	Passenger	60,920	5,004	0	65,924
	Passenger per plane	2.4	2.0	0	2.2
2010/11	Movement	24,889	2,289	92	27,270
	Passenger	59,084	4,382	208	63,674
	Passenger per plane	2.4	1.9	2.3	2.3
2011/12	Movement	23,725	2,110	470	26,305
	Passenger	73,799	2,718	1,572	78,089
	Passenger per plane	3.1	1.3	3.3	3.0
2012/13	Movement	25,638	2,045	444	28,127
	Passenger	86,809	2,611	1,651	91,071
	Passenger per plane	3.4	1.3	3.7	3.2

Source: Data between 2003/04 and 2010/11 were obtained from Namibia Integrated Transport Master Plan and data 2011/12 and 1012/13 were obtained from Annual Report of NAC.

### **Walvis Bay Airport**

There was no large fluctuation on the number of movements at Walvis Bay Airport. In FY 2012/13, the number of movements at Walvis Bay Airport was about 4,600 flights, of which 2,830, equivalent to about 62% of the total movements, were domestic flights. There were only about 60 movements of international flights representing less than 2% of the total number of movements.

**Table 6.80: Movements and passengers at Walvis Bay Airport**

Unit: movement flights; passenger persons; passenger per plane persons

Year		Domestic	Regional	International	Total
2008/09	Movement	3,181	1,675	68	4,924
	Passenger	14,039	55,137	298	69,474
	Passenger per plane	4.4	32.9	4.4	14.1
2009/10	Movement	2,438	1,813	55	4,306
	Passenger	13,767	61,480	223	75,470
	Passenger per plane	5.6	33.9	4.1	17.5
2010/11	Movement	2,349	1,866	69	4,284
	Passenger	11,620	61,516	334	73,470
	Passenger per plane	4.9	33.0	4.8	17.1
2011/12	Movement	2,523	2,525	63	5,111
	Passenger	17,551	70,140	330	88,021
	Passenger per plane	7.0	27.8	5.2	17.2
2012/13	Movement	2,828	1,704	59	4,591
	Passenger	26,356	61,789	469	88,614
	Passenger per plane	9.3	36.3	7.9	19.3

Source: Data between 2003/04 and 2010/11 were obtained from Namibia Integrated Transport Master Plan and data between 2011/12 and 1012/13 were obtained from Annual Report of NAC.

The average number of passengers per flight at Walvis Bay Airport fluctuated between 14 persons and 19 persons in the last 5 years. The average number of domestic and international passengers per flight at the airport were single digit figures. However, the average number of passengers per regional flight was around 30 persons.

### **Other airports**

Table 6.81 shows the number of movements at other 5 airports (Keetmanshoop, Lüderitz, Katima Mulilo, Ondangwa, and Rundu) in FY 2011/12 and FY 2012/13.

The total number of movements at these 5 airports in the last 2 years was 7,506 and 7,510. The number of movements of domestic flights in FY 2012/13 increased about 5% from the previous year. The number of movements of regional and international flights in FY 2012/13 decreased around 21% and 33% respectively from the previous year. The number of movements at Ondangwa Airport in the last 2 years was 2,920 and 2,945 respectively. The numbers at Ondangwa Airport accounted for around 40% of total number of 5 airports.

**Table 6.81: Movements and passengers at other 5 airports**

Unit: movement flights; passenger persons; passenger per plane persons

Year	Airport	Domestic	Regional	International	Total	
2011/12	Keetmanshoop	Movement	754	351	0	1,105
		Passenger	1,496	602	0	2,098
		Passengers per plane	2.0	1.7	0	1.9
	Lüderitz	Movement	1,167	74	0	1,241
		Passenger	3,794	109	0	3,903
		Passengers per plane	3.3	1.5	0	3.1
	Katima Mulilo	Movement	783	114	37	934
		Passenger	8,039	297	101	8,437
		Passengers per plane	10.3	2.6	2.7	9.0
	Ondangwa	Movement	2,336	207	377	2,920
		Passenger	35,927	385	305	36,617
		Passengers per plane	15.4	1.9	0.8	12.5
	Rundu	Movement	1,196	95	15	1,306
		Passenger	6,290	129	16	6,435
		Passengers per plane	5.3	1.4	1.1	4.9
Total	Movement	6,236	841	429	7,506	
	Passenger	55,546	1,522	422	57,490	
	Passengers per plane	8.9	1.8	1.0	7.7	
2012/13	Keetmanshoop	Movement	664	257	0	921
		Passenger	1,617	541	0	2,158
		Passengers per plane	2.4	2.1	0	2.3
	Lüderitz	Movement	1,527	96	0	1,623
		Passenger	6,127	57	0	6,184
		Passengers per plane	4.0	0.6	0	3.8
	Katima Mulilo	Movement	785	84	52	921
		Passenger	13,786	1,028	103	14,917
		Passengers per plane	17.6	12.2	2.0	16.2
	Ondangwa	Movement	2,555	178	212	2,945
		Passenger	40,664	211	224	41,099
		Passengers per plane	15.9	1.2	1.1	14.0
	Rundu	Movement	1,028	49	23	1,100
		Passenger	6,274	67	33	6,374
		Passengers per plane	6.1	1.4	1.4	5.8
Total	Movement	6,559	664	287	7,510	
	Passenger	68,468	1,904	360	70,732	
	Passengers per plane	10.4	2.9	1.3	9.4	

Source: Annual Report of NAC (2012/13).

The average number of passengers per domestic flight at Katima Mulilo and Ondangwa Airport in FY 2011/12 and FY 2012/13 was more than 10. However, the average number of passengers per other flight at 5 airports were single digit figures.

### 6.6.3.3 Cargo traffic

According to “World Airport Traffic Report 2009”, 4 airports (HKIA, Eros, Walvis Bay and Lüderitz)

handled air cargo in Namibia. The cargo volume handled at the 4 airports was 8,611 tons in 2008 and 7,315 tons in 2009 respectively. Almost all cargo handled was international freight. HKIA handled about 87% of the total cargo.

Walvis Bay Port handled around 5 million tons in 2008 and 2009. Compared to the port handling volume, cargo volume handled at the airports is very small.

**Table 6.82: Freight throughput at airports in Namibia**

Airport	Freights	Unit: tons	
		2008	2009
HKIA	International freights (loading/unloading)	-	-
	Domestic freights (loading/unloading)	-	--
	Total freights (loading/unloading)	<b>7,464</b>	<b>6,362</b>
Walvis Bay	International freights (loading/unloading)	12	11
	Domestic freights (loading/unloading)	98	3
	Total freights (loading/unloading)	<b>110</b>	<b>14</b>
Eros	International freights (loading/unloading)	-	-
	Domestic freights (loading/unloading)	-	-
	Total freights (loading/unloading)	<b>1,028</b>	<b>934</b>
Lüderitz	International freights (loading/unloading)	-	-
	Domestic freights (loading/unloading)	9	5
	Total freights (loading/unloading)	<b>9</b>	<b>5</b>
Total	International freights (loading/unloading)	-	-
	Domestic freights (loading/unloading)	-	-
	Total freights (loading/unloading)	<b>8,611</b>	<b>7,315</b>

Source: World Airport Traffic Report 2009

#### 6.6.3.4 Financial situation

The statements of comprehensive income of NAC in 2011/12, 2012/13 and 2013/14 are shown in Table 6.83. NAC made a profit (total comprehensive income) of N\$53 million in 2011/12 and N\$50 million in 2012/13, however, put out a deficit of N\$9.7 million in 2013/14. The profit in 2011/12 comes from a rebate of income tax (N\$57 million) and net financial income supports total comprehensive income of NAC. The net profit (loss) from operating activities recorded a loss of N\$22 million and N\$20 million in 2011/12 and 2013/14, respectively.

Revenues in the last 3 years were N\$276 million, N\$199 million and N\$ 205 million, respectively. NAC's main revenue is operating income that consists of landing fees, passenger service fees, aircraft parking fees, apron bus fees, after-hours operating fees, motor vehicle parking fees, rental income, concession revenue, commission income, and handling fees. Out of these revenue items, passenger service fees accounted for more than half of the total revenue. The amount of passenger service fees in the last 3 years was N\$ 151 million, N\$ 114 million and N\$ 117 million, respectively.

Expenses in the last 3 years were N\$298 million, N\$180 million and N\$ 225 million, respectively. Expenses consisted of many items, of which staff costs accounted for a significant part of the total expenses. The amount of staff costs in the last 3 years was N\$ 146 million, N\$ 64 million and N\$ 92 million respectively. The proportion of staff costs to the total expenses in the last 3 years was about 49%, 36% and 41%, respectively. The number of staff at NAC was 265, 273 and 274 respectively.

Therefore, the average salary per staff member was about N\$ 549,500, N\$ 235,400 and N\$ 335,300 respectively. NAC lowered the wages of staff by more than half in FY 2012/13; therefore, NAC recorded a net profit from operating income in FY 2012/13.

NAC spent N\$ 13 million in FY 2011/12 and N\$ 11 million in FY 2012/13 for “Repairs and Maintenance”. These percentages in total expense were about 4% to 5%, however, the expense for repair and maintenance increased to N\$ 14 million in FY 2013/14. It accounted for more than 18% of the total expense.

**Table 6.83: Comprehensive income situation of NAC**

Items		2011/12 (19 months)	2012/13 (12 months)	2013/14 (12 months)		
Revenue	Operating income	Landing fees	41,983,572	31,213,882	29,791,427	
		Passenger service fees	150,958,302	113,800,820	116,979,268	
		Aircraft parking fees	5,204,268	3,717,043	3,426,100	
		Apron bus fees	0	0	20,122	
		After-hours operating fees	2,843,715	2,317,997	723,560	
		Motor vehicle parking fees	6,785,253	5,097,594	5,988,662	
		Rental income	53,162,310	27,826,510	34,813,324	
		Concession revenue	2,091,480	1,331,010	1,348,460	
		Commission income	3,499,377	2,956,665	4,321,506	
		Handling fees	3,498,055	2,871,656	3,123,911	
		Total operating Income (1)	<b>270,026,332</b>	<b>191,133,177</b>	<b>200,536,340</b>	
Other operating income	(2)	6,278,882	7,537,944	4,658,267		
<b>Total revenue</b>	<b>(3) = (1+2)</b>	<b>276,305,214</b>	<b>198,671,121</b>	<b>205,194,607</b>		
Expense	Depreciation	(4)	(71,241,324)	(49,748,014)	(51,946,141)	
		Operating lease rentals	Land and building	(3,590,590)	(2,537,930)	(2,928,851)
	Auditor's remuneration	Office equipment	(66,371)	(52,542)	(24,422)	
		(5)	(3,656,961)	(2,590,472)	(2,953,273)	
	Director's emoluments (7)*	Current year fees	(216,120)	(689,055)	(250,470)	
		Prior year under provision	(831,636)	(0)	(1,168,997)	
		Total auditor's remuneration (6)	(1,047,756)	(689,055)	(1,419,467)	
	Staff costs (8)**	(145,623,803)	(64,267,870)	(91,880,059)		
	Remuneration (9)	(20,733,825)	(14,887,789)	(15,306,201)		
	Consulting Fees (10)	(5,684,735)	(8,167,696)	(6,103,802)		
	Repairs and maintenance	Land, building, roads and runways	(6,632,658)	(5,737,484)	(7,954,296)	
			(3,019,750)	(3,465,416)	(4,039,736)	
			Office and other equipment	(22,650)	(27,224)	(3,214)
			Motor vehicles	(3,407,886)	(1,346,149)	(1,904,648)
	Total repairs and maintenance (11)	(13,082,944)	(10,576,273)	(13,901,894)		
Others (12)	(35,802,655)	(28,897,496)	(40,958,853)			
<b>Total expense</b>	<b>(13) = (4+5+6+7+8+9+10+11+12)</b>	<b>(298,129,937)</b>	<b>(180,416,227)</b>	<b>(225,163,090)</b>		
<b>Net profit (loss) from operating activities</b>		<b>(21,824,723)</b>	<b>18,254,894</b>	<b>(19,968,483)</b>		
Financial income		18,371,280	12,250,002	12,025,152		
Financial costs		(447,404)	(323,048)	(437,266)		
<b>Net finance income</b>		<b>17,923,876</b>	<b>11,926,954</b>	<b>11,587,886</b>		
<b>(Loss) profit before tax</b>		<b>(3,900,847)</b>	<b>30,181,848</b>	<b>(8,380,597)</b>		
Income tax		56,519,747	20,200,008	(1,281,633)		
<b>Total comprehensive income for the year</b>		<b>52,618,900</b>	<b>50,381,856</b>	<b>(9,662,230)</b>		

Note: \* No of directors: 5 in 2011, and 3 in 2012; \*\* No of staffs: 265 in 2011, 273 in 2012 and 274 in 2013.

Source: Annual Report of NAC (2012/13) and Annual Financial Statements for the year ended 31 March 2014

Table 6.84 indicates the financial position of NAC. Out of the total equity and liabilities, the proportion of equity occupies 75 to 77%.

**Table 6.84: Financial position of NAC**

Unit: N\$ 000

Items	2011/12	2012/13	2013/14
Non-current assets	1,683,537	1,694,505	1,782,487
Current assets	352,686	418,417	400,571
Total assets	2,036,223	2,112,922	2,183,058
Equity	1,518,862	1,634,018	1,680,804
Non-current liabilities	458,994	438,794	440,076
Current liabilities	53,366	40,110	62,178
Total liabilities	517,361	478,904	502,254
Total equity and liabilities	2,036,223	2,112,922	2,183,058

Source: Annual Report of NAC (2012/13) and Annual Financial Statements for the year ended 31 March 2014

### 6.6.3.5 Information service

NAC has developed the company's website to provide information on outlines and activities of the company, however, information on a flight schedule such as names of airlines, departure and arrival dates and flight situations are not provided.

NAC also prepares flight information boards in NAC's airports. The board shows flight numbers, departure time of planes and destinations; however, the system often does not work properly. Information on the present situation of a flight operation is not updated. Ground staff of airlines announce the information but the information is sometimes not correct.

### 6.6.4 Air Namibia

Air Namibia was established in 1946 under the name of "South West Airways". It changed the name to "Namib Air and finally took the name of "Air Namibia" after independence of Namibia in 1990.

#### 6.6.4.1 Organization and human resources

As of October 2014, Air Namibia has 6 departments (Office of the Managing Director, Commercial Services, Flight Operations, Ground Operations, Finance, and Human Resources) and a total of 704 staff members.

Table 5.82 shows the names and roles of departments and number of staff in Air Namibia.

**Table 6.85: Departments and number of staffs (as of October 2014)**

Departments	Main roles	No of staffs
Office of the Managing Director	Drive strategy execution	21
Commercial Services	Revenue generation and marketing	154
Flight Operations	Flight crew and cabin crew management	458
Ground Operations	Airport services, flight dispatch planning and inflight supplies	
Finance	Financial planning and control	31
Human Resources	Manpower sourcing, return and rewarding	40
Total		704

Source: Air Namibia



### 6.6.4.2 Network

Table 5.83 shows the network of Air Namibia from 2009 to 2013. The number of flight routes of Air Namibia to/from HKIA increased from 6 (5 regional/international and one domestic) in 2009 to 10 (8 regional/international and 2 domestic) in 2013. However, the number of flight routes of Air Namibia to/from EROS decreased from 5 (one regional and 4 domestic) in 2009 to 2 domestic in 2013.

**Table 6.86: Network of Air Namibia (from 2009 to 2013)**

Airport to/from		2009	2010	2011	2012	2013
HKIA	Accra	N	O	O	O	O
	Lusaka/Harare	N	O	O	O	O
	Frankfurt	O	O	O	O	O
	London/Gatwick	O	O	N	N	N
	Johannesburg	O	O	O	O	O
	Cape Town	O	O	O	O	O
	Luanda	O	O	O	O	O
	Walvis Bay	O	O	O	O	O
	Lüderitz/Oranjemund	N	N	N	O	O
	Maun/Victoria Falls	N	O	O	O	O
	Ondangwa	N	N	O	O	N
	Gaborone	N	N	O	O	O
Total	6	9	10	11	10	
EROS	Rundu/ M'pacha	O	O	O	O	O
	Cape Town	O	O	O	N	N
	Walvis Bay	O	O	O	N	N
	Lüderitz/Oranjemund	O	O	O	N	N
	Maun/Victoria Falls	N	O	N	N	N
	Ondangwa	O	O	O	O	O
	Total	5	6	5	2	2

Note: N not operated; O operated

Source: Air Namibia

According to the schedule of Air Namibia (as of 6<sup>th</sup> April to 26<sup>th</sup> June 2014), Air Namibia operates 2 international flights from HKIA<sup>6</sup>, 7 regional flights from HKIA and 6 domestic flights from HKIA and Eros respectively. Table 6.87 shows destinations and schedules.

**Table 6.87: Current schedule of Air Namibia flights**

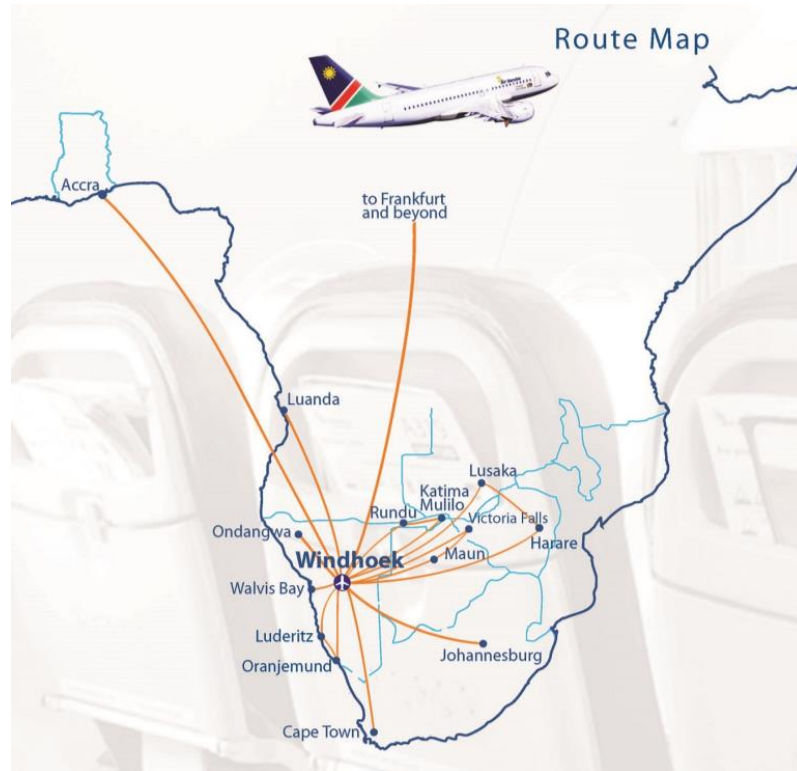
Airports from	Airports to	Schedule	
		As of 6 <sup>th</sup> April to 26 <sup>th</sup> June 2014	Until 28 March 2015
International (HKIA)	Frankfurt (Germany)	6 flights per week (SW285) except Tuesday	6 flights per week (1 Dec. – 30 June) 7 flights per week (1 July – 30 Nov.)
	Accra (Ghana)	3 flights per week (SW722)	No flight
Regional (HKIA)	Cape Town (South Africa)	14 flights (SW703, SW709) per week	14 flights per week
	Johannesburg (South Africa)	17 flights (SW508, SW723, SW729, and SW727) per week	14 flights per week
	Lusaka (Zambia)	4 flights per week (SW373, SW413)	4 flights per week
	Harare (Zimbabwe)	2 flights per week (SW413)	4 flights per week
	Victoria Falls (Zimbabwe)	4 flights per week (SW403, SW406)	4 flights per week
	Maun (Botswana)	4 flights per week (SW373, SW406)	4 flights per week
	Luanda (Angola)	7 flights (SW303) per week	6 flights per week
Domestic (HKIA)	Walvis Bay	14 flights (SW165, SW166) per week	7 flights per week
	Lüderitz	4 flights per week (SW143)	4 flights per week
	Oranjemund via Lüderitz	4 flights per week (SW143)	4 flights per week
Domestic (Eros)	Katima Mulilo via Rundu	4 flights per week (SW125, SW127)	4 flights per week

<sup>6</sup> Air Namibia officially terminated a flight to Accra on 26 June 2014.

Airports from	Airports to	Schedule	
		As of 6 <sup>th</sup> April to 26 <sup>th</sup> June 2014	Until 28 March 2015
	Rundu	4 flights per week (SW125, SW127)	4 flights per week
	Ondangwa	15 flights (SW107, 101 and 103) per week	13 flights per week

Note: Air Namibia officially announced that flight to Accra is going to be terminated on 26 June 2014.

Source: Air Namibia Schedule 06 April to 26 June 2014 and until 28th March 2015



Note: Air Namibia officially announced that the flight to Accra is going to be terminated on 26 June 2014.

Source: Air Namibia Schedule 06 April to 26 June 2014

**Figure 6.18: Air Namibia's route map**

### 6.6.4.3 Fleet

Previously, Air Namibia owned one Boeing B747-SP, one Boeing B747-400 Combi that was used for carrying both passenger and cargo, 2 Boeing 737s, 4 Beechcraft 1900s, and 2 Airbus A340-300s. This fleet has been replaced as shown in Table 6.88. At present, Air Namibia owns 10 passenger aircraft.

**Table 6.88: Models and number of aircraft operated by Air Namibia**

Models	Maximum passenger	Year phased-out	Numbers
Boeing 747-SP		2000	(1)
Boeing 747-400 Comb		2004	(1)
Beechcraft 1900		2012	(4)
Boeing 737		2012	(2)
Airbus A340		2013	(2)
Airbus A330-200	244	In operation	2
Airbus A 319-100	112	In operation	4
Embraer ERJ135	37	In operation	4
Total			10

Note: ( ) indicates number of fleets Air Naibia owned

Source: Air Namibia

#### **6.6.4.4 Traffic**

##### **Passengers and revenue from passengers**

The total number of passengers transported by Air Namibia in 2013 was 498,858, which increased by 27.0% from 392,704 in 2009. The number is broken down as follows:

- International passengers transported in 2013 were 152,556, which decreased by 4% from 158,967 in 2009. The most dominant international route that passengers used was the route between HKIA and Frankfurt.
- Regional passengers transported in 2013 were 256,528, which increased by 28.9% from 198,944 in 2009. The most dominant regional route that passengers used was the route between HKIA and two airports in South Africa, Johannesburg and Cape Town.
- Domestic passengers transported in 2013 were 89,774, which drastically increased by 158% from 34,793 in 2009. The most dominant domestic route that passengers used was the route between Eros and Ondangwa. The rate of international, regional and domestic passengers transported by Air Namibia was 40.5%, 50.7% and 8.8% in 2009 and 30.6%, 51.4% and 18.0% in 2013 respectively.

In spite of the increase in number of passengers, revenue from passengers gradually decreased from N\$1,126 million in 2009 to N\$934 million in 2013. A breakdown of revenue from passengers is as follows:

- Revenue from international passengers in 2013 was N\$537.7 million, which decreased by 29.0% from N\$756.9 million in 2009.
- Revenue from regional passengers in 2013 was N\$317.1 million, which decreased by 3.3% from N\$327.9 million in 2009.
- However, revenue from domestic passengers in 2013 was N\$79.4 million, which increased by 90.9% from N\$41.6 million in 2009.

The average revenue per passenger from all passengers was N\$2,868.1 in 2009. In 2013, however, the average revenue per passenger dropped to N\$1,872.5, which decreased by 34.7%. The average revenue per passenger decreased year by year. The average revenue per passenger from international, regional and domestic passengers in 2013 also decreased from the average revenue per passenger in 2009. It is broken down as follows:

- Average revenue per passenger from international passengers in 2013 was N\$3,524.3, which decreased by 26.0% from N\$4,761.3 in 2009.
- Average revenue per passenger from regional passengers in 2013 was N\$1,236.0, which decreased by 25.0% from N\$1,648.0 in 2009.
- Average revenue per passenger from domestic passengers in 2013 was N\$1,027.4, which also decreased by 14.1% from N\$1,196.3 in 2009.

**Table 6.89: Passengers and revenue from passengers**

Unit: passenger persons; revenue N\$ 000; revenue per passengers N\$

	Airports	Routes	Items	2009	2010	2011	2012	2013	
International	HKIA	Accra	Passenger	0	479	2,701	13,892	19,994	
			Revenue	0	1,213	7,955	33,781	48,484	
		Frankfurt	Passenger	120,197	127,152	127,063	128,815	132,562	
			Revenue	601,749	595,415	539,761	570,505	489,170	
		Gatwick (London)	Passenger	38,770	4,964	0	0	0	
			Revenue	155,146	18,653	0	0	0	
	Total	Passenger	158,967	132,595	129,764	142,707	152,556		
		Revenue	756,895	615,281	547,716	604,286	537,655		
		Revenue per passenger	4,761	4,640	4,221	4,234	3,524		
	Regional	HKIA	Lusaka/ Harare	Passenger	0	1,219	3,171	7,710	15,829
Revenue				0	1,816	4,740	11,611	19,510	
Johannesburg			Passenger	65,325	63,053	70,777	84,021	86,022	
			Revenue	92,038	79,921	88,909	94,668	70,775	
Cape Town			Passenger	91,251	77,139	74,037	83,604	94,927	
			Revenue	131,773	107,588	100,928	120,556	112,405	
Luanda			Passenger	35,883	43,273	41,232	45,304	45,919	
			Revenue	93,165	107,653	100,359	109,813	97,846	
Maun/ Victoria falls			Passenger	6,345	5,016	4,778	7,354	9,116	
			Revenue	10,728	8,305	8,404	13,054	11,868	
Gaborone			Passenger	0	0	0	0	4,715	
			Revenue	0	0	0	0	4,667	
Sub-Total			Passenger	198,804	189,700	193,995	227,993	256,528	
			Revenue	327,705	305,283	303,339	349,702	317,071	
			Revenue per passenger	1,648	1,609	1,564	1,534	1,236	
Eros			Cape Town	Passenger	140	145	78	0	0
				Revenue	156	160	86	0	0
Total			Passenger	198,944	189,845	194,073	227,993	256,528	
		Revenue	327,861	305,443	303,425	349,702	317,071		
		Revenue per passenger	1,648	1,609	1,563	1,534	1,236		
Domestic	HKIA	Walvis Bay	Passenger	2,437	4,716	4,436	12,011	24,515	
			Revenue	2,846	3,407	3,170	7,483	11,618	
		Lüderitz/ Oranjemund	Passenger	0	0	0	2,914	5,717	
			Revenue	0	0	0	2,990	6,573	
		Ondangwa	Passenger	0	0	58	106	0	
			Revenue	0	0	44	75	0	
		Sub-Total	Passenger	2,437	4,716	4,494	15,031	30,232	
			Revenue	2,846	3,407	3,215	10,548	18,191	
	Revenue per passenger		1,168	722	715	702	602		
	Eros	Rundu/Mpacha	Passenger	2,095	2,382	2,442	9,235	15,875	
			Revenue	3,862	4,439	4,622	10,645	16,163	
		Walvis Bay	Passenger	3,692	2,098	2,093	3	0	
			Revenue	2,577	1,513	1,703	2	0	
		Lüderitz/ Oranjemund	Passenger	6,161	3,123	1,866	0	7,364	
			Revenue	8,460	4,461	2,854	0	6,416	
		Ondangwa	Passenger	20,408	19,466	20,229	33,449	36,303	
			Revenue	23,807	24,295	26,116	39,975	38,596	
		Sub-Total	Passenger	32,356	27,069	26,630	42,687	59,542	
			Revenue	38,706	34,709	35,294	50,622	61,176	
			Revenue per passenger	1,196	1,282	1,325	1,186	1,027	
		Total	Passenger	34,793	31,785	31,124	57,718	89,774	
			Revenue	41,552	38,116	38,509	61,169	79,367	
Revenue per passenger			1,194	1,199	1,237	1,060	884		
Grand Total	Passenger	392,704	354,225	354,961	428,418	498,858			
	Revenue	1,126,308	958,840	889,649	1,015,157	934,092			
	Revenue per passenger	2,868	2,707	2,506	2,370	1,872			

Source: Air Namibia

### **Cargo volume and revenue from cargo transport**

Air Namibia previously owned a Boeing 747-400 Combi for carrying both passengers and cargo. However, the fleet was phased out in 2004 and no cargo fleet was purchased; therefore, all cargos were transported by passenger planes from 2005. The cargo activity of Air Namibia is quite moderate. The cargo volume handled by Air Namibia was only about 6,100 tons in 2013. Cargo traffic is concentrated on international routes, and to a lesser extent on regional routes. Cargo on domestic routes is very small.

The total cargo volume increased rapidly to 8,442.9 tons in 2011 from 504.7 tons in 2009. The increase in rate during that span was more than 1,500%. In 2013, however, the volume decreased to 6,131.2 tons. The breakdown of total cargo volume is as follows:

- International cargo volume was 413.8 tons in 2009. In 2012, the volume was 5,729.5 tons, which increased by nearly 1,300% from 2009. However, the volume decreased to 4,828.7 tons in 2013. The most dominant route for international cargo transportation is the route between HKIA and Frankfurt.
- Regional cargo volume was 89.8 tons in 2009. The volume in 2011 increased to 2,675.3 tons, which is an increase of nearly 2,900%, however, the volume decreased to 1,250.6 tons in 2013. The most dominant route for regional cargo transportation was the route between HKIA and Johannesburg.
- Domestic cargo volume was only 1.12 tons in 2009. In 2012, the volume was 72.0 tons, which was up more than 64-fold from the volume in 2009, however, the volume decreased to 51.9 tons in 2013. The most dominant route for domestic cargo transportation was the route between HKIA and Walvis Bay. Cargo transportation on this route started from 2011.

The total revenue from cargo was about N\$7.27 million in 2009. The revenue increased very rapidly and reached about N\$105.18 million in 2012, which increased by about 1,350% from 2009. However, it dropped to about N\$102.92 million in 2013. It is broken down as follows:

- Revenue from international cargo in 2013 was about N\$92.57 million, which increased by about 1,170% from about N\$7.27 million in 2009.
- Revenue from regional cargo in 2009 was about N\$0.59 million. The revenue grew up to about N\$12.78 million in 2011, which increased by about 2,200% from the volume in 2009, however, the revenue dropped to about N\$9.10 million in 2013.
- Revenue from domestic cargo was only about N\$44,700 in 2009, however, the revenue increased rapidly to about N\$1.49 million, which was about 33 times larger than the volume in 2009. In 2013, the volume was about N\$1.24 million.

Revenue per cargo volume was about N\$15,700 in 2009. The revenue decreased gradually year by year and was about N\$11,600 in 2011. However, it increased to about N\$16,800 in 2013. It is broken down as follows:

- Revenue per cargo volume of international cargo was about N\$17,600 in 2009. The revenue decreased gradually and was about N\$14,700 in 2011; however, it increased to about N\$19,200 in 2013.
- Revenue per cargo volume of regional cargo in 2009 was about N\$6,600. The revenue dropped to about N\$4,600 in 2011 and N\$4,700 in 2012, however, it increased to about N\$7,300 in 2013.
- Revenue per cargo volume of domestic cargo is higher than revenue per cargo volume of international and regional cargo. Revenue per cargo volume of domestic cargo in 2009 was only about N\$44,700, however, the revenue declined to about N\$24,000, which decreased by 46.3% from the revenue in 2009.

**Table 6.90: Air Namibia's cargo handling volume**

Unit: Cargo volume tons; Revenue N\$ 000; Revenue per ton N\$

	Airports	Routes	Items	2009	2010	2011	2012	2013
International	HKIA	Accra	Cargo volume	0	0	1	99	134
			Revenue	0	0	21	1,275	1,652
		Frankfurt	Cargo volume	283	4,340	5,722	5,630	4,695
			Revenue	5,179	68,513	84,378	91,122	90,919
		Gatwick (London)	Cargo volume	131	88	0	0	0
			Revenue	2,089	1,096	0	0	0
	Total	Cargo volume	414	4,429	5,723	5,729	4,829	
Revenue	7,268	69,609	84,399	92,397	92,571			
Revenue per ton	17,565	15,718	14,746	16,127	19,171			
Regional	HKIA	Lusaka/ Harare	Cargo volume	0	6	19	24	13
			Revenue	0	135	370	376	181
		Johannesburg	Cargo volume	66	832	2,033	2,211	1,071
			Revenue	388	5,852	6,659	8,650	6,577
		Cape Town	Cargo volume	2	51	79	94	76
			Revenue	27	529	622	631	924
		Luanda	Cargo volume	23	410	530	69	51
			Revenue	177	3,045	5,121	1,622	1,144
		Maun/ Victoria falls	Cargo volume	0	0	0	0	0
			Revenue	0	3	1	4	13
		Gaborone	Cargo volume	0	0	14	58	38
			Revenue	0	0	3	8	264
	Sub-Total	Cargo volume	90	1,299	2,675	2,455	1,251	
	Revenue	592	9,563	12,775	11,292	9,104		
	Revenue per ton	6,599	7,362	4,775	4,599	7,279		
	Eros	Cape Town	Cargo volume	0	0	0	0	0
			Revenue	0	1	1	0	0
		Maun/ Victoria falls	Cargo volume	0	0	0	0	0
			Revenue	0	2	0	0	0
		Sub-Total	Cargo volume	0	0	0	0	0
			Revenue	0	2	1	0	0
Revenue per ton	0	108,576	811,500	0	0			
Total	Cargo volume	90	1,299	2,675	2,455	1,251		
	Revenue	592	9,566	12,776	11,292	9,104		
	Revenue per ton	6,599	7,364	4,776	4,599	7,279		
Domestic	HKIA	Walvis Bay	Cargo volume	1	8	41	60	38
			Revenue	7	138	673	1,156	927
		Lüderitz/ Oranjemund	Cargo volume	0	0	0	0	0
			Revenue	0	0	0	6	7
	Sub-Total	Cargo volume	1	8	41	60	38	
		Revenue	7	138	673	1,163	934	
		Revenue per ton	11,660	17,711	16,417	19,362	24,707	

	Airports	Routes	Items	2009	2010	2011	2012	2013
	Eros	Rundu/Mpacha	Cargo volume	0	1	1	10	10
			Revenue	3	90	50	261	228
		Walvis Bay	Cargo volume	0	1	0	0	0
			Revenue	6	50	31	0	0
		Lüderitz/ Oranjemund	Cargo volume	0	4	1	0	0
			Revenue	22	256	59	0	0
		Ondangwa	Cargo volume	0	1	1	2	4
			Revenue	7	159	129	65	81
		Sub-Total	Cargo volume	0	7	3	12	14
			Revenue	37	556	270	326	309
			Revenue per ton	77,764	85,302	82,583	27,370	21,984
		Total	Cargo volume	1	14	44	72	52
			Revenue	45	694	942	1,489	1,243
			Revenue per ton	39,847	48,489	21,304	20,688	23,968
		Grand Total	Cargo volume		505	5,742	8,443	8,257
Revenue	7,905		79,869	98,117	105,177	102,918		
Revenue per ton	15,663		13,909	11,621	12,738	16,786		

Source: Air Namibia

#### 6.6.4.5 Partnership (code share and interlining)

Air Namibia is continuously looking for airlines to form partnerships to extend the business of the company. Currently, Air Namibia holds a code-share agreement with Kenya Airways and TAAG Angolan Airlines. Air Namibia also has an interlining or interlines ticketing agreement with Lufthansa German Airlines, Delta Airlines, Emirates and Singapore Airlines.

**Table5.88: Partnership airlines with Air Namibia**

Partnership	Airline	Remarks
Code share	Kenya Airways	–
	TAAG Angolan Airlines	–
Interlining	Lufthansa German Airlines	Traffic to Europe Extended interline e-ticket agreement for feeders between Frankfurt and about 62 European cities
	Delta Airlines	Traffic to USA
	Emirates	Traffic to Far-East
	Singapore Airlines	Traffic to Far-East

Source: Air Namibia

#### 6.6.4.6 Future perspective

One of the major strategies of Air Namibia is to develop a geographically focused network centred on a “hub” in Windhoek. This strategy enables Air Namibia to reduce its operation costs and increase its revenue from passengers attracted by better connections between the domestic, regional and international markets. In order to develop and become profitable, the following is necessary for Air Namibia.

- Increase flight frequencies, with more convenient timing and faster connections,
- Focus on routes which can prove to be profitable and close non-profitable routes, and
- Reduce operation costs and, simultaneously, increase the quality of services.

### 6.6.5 Future plans and on-going projects

African Development Bank (ADB) is currently funding the following projects in the Namibian aviation sector:

- Study for upgrading HKIA terminal,
- Environmental Master Plan for 8 regional airports, and
- Land-use Master Plan for 5 regional airports.

In addition to above plans, the following projects are being implemented and are planned by NAC.

- Walvis Bay Airport: expansion of a runway and taxiway and a terminal building and installation of ILS is now being implemented. Construction of standard fencing is being planned.
- Lüderitz Airport: upgrading of the existing terminal building is envisaged.
- Ondangwa Airport: construction of the new terminal building is being conducted. Rehabilitation of runway, taxiway, and apron, and upgrading of electrical fittings and surfacing of access road and parking facilities has been planned by NAC.
- Katima Mulilo Airport: A feasibility study for the development of the airport has been carried out.



Airport Upgrading Plan

Source: JICA Study Team



Terminal Building Expansion

**Photo 6.10: Upgrading of Walvis Bay Airport**

### 6.6.6 Issues on aviation development

The aviation sector of Namibia experiences the following bottlenecks, in particular from a safety viewpoint.

- Poor condition of runways at some airports such as Ondangwa and Katima Mulilo.
- Lack of safety equipment such as runway lighting and a fire stations at some airports
- Poor information service to passengers and airport users
- Decrease in the number of international passengers in spite of an increase in the total number of passengers, and
- Decrease of revenue per passenger