

Part 2

**Supplemental information of
Logistics Hub Master Plan**

10. Demand Forecast

10.1 Introduction

The future freight demand relevant to Namibia is forecast for (i) the estimation of potential of transit cargo demand through Namibia, (ii) evaluation of existing infrastructure such as road and railway for the future growth of freight demand and contribution to planning of improvement and development plan.

For that purpose, the future freight demand is forecast considering the growth of international trade of neighbouring countries, assumption of international transit cargo through Namibia and by surface transport modes. The future freight demand is calculated for the following cases.

- Target years of demand forecast are 2013 as existing, 2015, 2020, 2025 and further 2045.
- For the potential transit cargo through Namibia, international trade of goods between Zambia, Botswana and Europe, America, Angola and South Africa are included. Especially, transit cargo of Zambia and Botswana is forecast for two cases, namely, (i) As a base case, same ratio of existing transit cargo through Namibia of international trade of Zambia / Botswana with Europe / America is applied to future international trade of Zambia and Botswana with Europe / America, and (ii) as a maximum case, 100% of trade of Zambia / Botswana with Europe / America is assumed to pass through Namibia.
- Future freight volume by transport mode, namely, road and railway is computed by (i) existing modal share by origin, destination and type of commodity, and (ii) proposed socio-economical modal share and service.

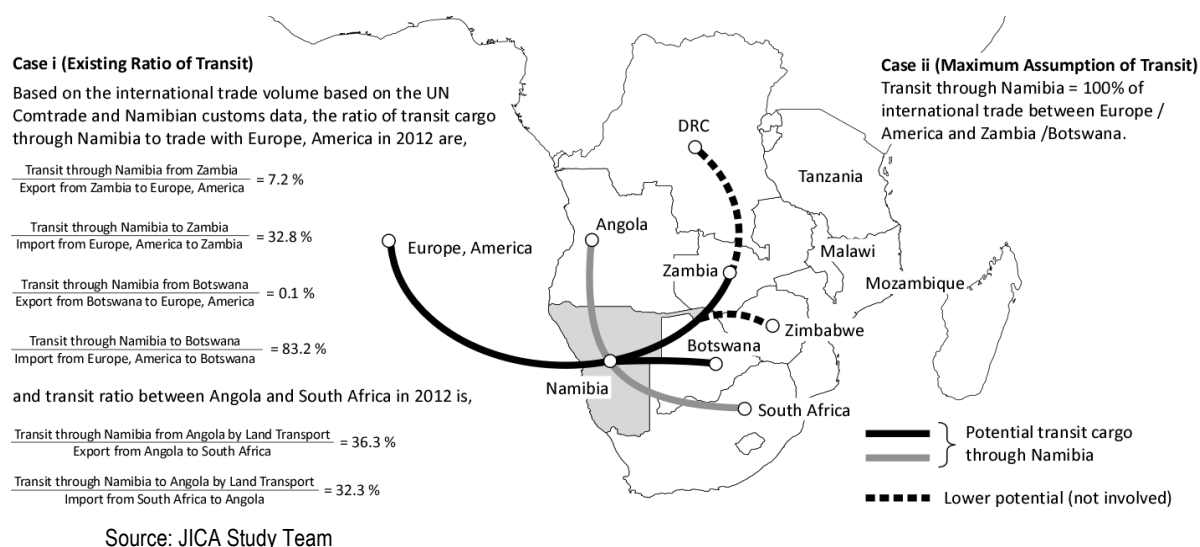
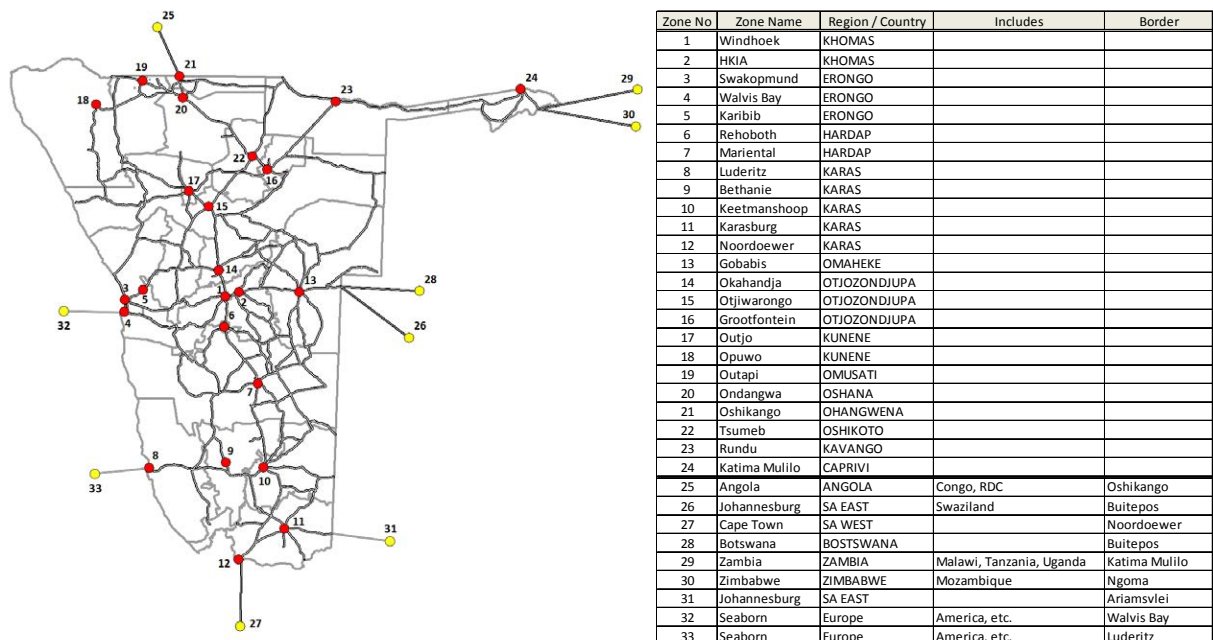


Figure 10.1: Assumption of potential transit cargo through Namibia

Future freight demand prepared by origin and destination (OD) is assigned on the transport network modelled by computer program to confirm forecast volume at section or route of road and railway. For demand assignment of road transport, the freight volume should be converted to vehicular volume and other passenger vehicle demand should also be included in the calculation. Such information and data, transport network model, traffic analysis zone system to identify OD of cargo or passenger trip, passenger vehicle demand in future are prepared in the Transport Master Plan. That information and data including results of traffic survey carried out in the Transport Master Plan is modified or updated to be used for the demand forecast in this Study.

- Traffic analysis zone (TAZ) system defined by the Transport Master Plan based on the constituency consists of 30 zones including 6 external zones. In the Study, 3 external zones (Ariamsvlei, seaborne at Walvis Bay, and seaborne at Lüderitz) are added and in total 33 zone systems are used.
- Transport network including road and rail network prepared by the Transport Master Plan is converted to STRADA²⁷ files for network assignment in the Study.
- Current freight OD of road transport as of 2011 is re-calculated by the results of the roadside driver interview survey carried out by the Transport Master Plan. Freight OD in 2011 of railway is calculated based on the transportation results provided by TransNamib.
- Future passenger vehicle OD in 2011, 2015 and 2030 are forecast by the Transport Master Plan. In this Study, passenger vehicle OD in 2013, 2020, 2025 are calculated by average growth rate based on the passenger vehicle ODs prepared by the Transport Master Plan.



Source: JICA Study Team

Figure 10.2: Traffic analysis zone system and road network

²⁷ STARADA is the statistics traffic simulation program developed by JICA.

10.2 Future freight demand forecast

Future freight demand relevant to Namibia is estimated using the following steps.

- Estimation of existing freight demand, namely, flow of cargo from zone i to zone j based on data provided by the Transport Master Plan and TransNamib.
- Forecasting of future cargo generation by zone based on existing cargo generation by zone and growth rate of cargo generation in accordance with zonal attribute such as population by zone.
- Future cargo OD matrices are calculated by fratar method using the pattern of existing cargo flow such as from zone i to zone j, and future cargo generation by zone such as cargo volume produced at zone i and attracted to zone j.
- On the other hand, Future international cargo flow considering transition of international trade on SADC countries is forecast based on a time series analysis. Forecast future export and import volume by type of commodity of relevant countries is applied to OD matrices by TAZ. Forecast export and import of Namibia are distributed to external zone defined by country and customs data, and domestic zone in accordance with zonal cargo generation. Transit cargo through Namibia such as trade between South Africa and Angola, Zambia and Europe/America are distributed to proper external zones based on the transit data of customs.
- Future freight OD is estimated by replacing of external OD of OD matrices calculated by fratar method with external OD reflecting transition of international trade of relevant countries.
- Forecasted cargo OD matrices are split into two representative transport modes, namely, railway and road transport in order to provide future cargo volume assigned on each network in Namibia. As a base case, future cargo OD is divided into two modes by ratio of existing modal share by origin, destination and type of commodity.
- Assignment of future cargo OD of railway on railway network.
- Future cargo OD of road transport is assigned on road network, and cargo OD is converted to vehicular OD by average loading weight and empty truck ratio. Vehicular OD calculated by cargo OD is assigned on road network along with passenger vehicle OD prepared by the Transport Master Plan.

10.2.1 Estimation of existing freight demand in Namibia

Future freight OD, in this Study is forecast by present pattern method that is a repeat calculation using existing OD data and future trips of cargo generated by TAZ. To forecast future freight OD in Namibia, existing cargo flow by OD data should be prepared. Cargo through Namibia is mainly transported by road and railway with regards to weight of transported commodity.

The results of the roadside driver interview survey in 2011 carried out in the Transport Master Plan is

the data enabling us to understand the existing cargo flow by road transport in Namibia including international transport. In the driver interview survey in 2011 carried out at 15 locations on the inter-city trunk road, 83 trucks including light commercial vehicles less than 4.5 tonnes were surveyed and expanded by the annual average daily traffic (AADT) provided by Road Authority per location. Existing cargo flow by road indicated by daily tonnes by OD and type of commodity is estimated by the results of the survey including origin, destination, type of vehicle, loading commodity and loading weight.

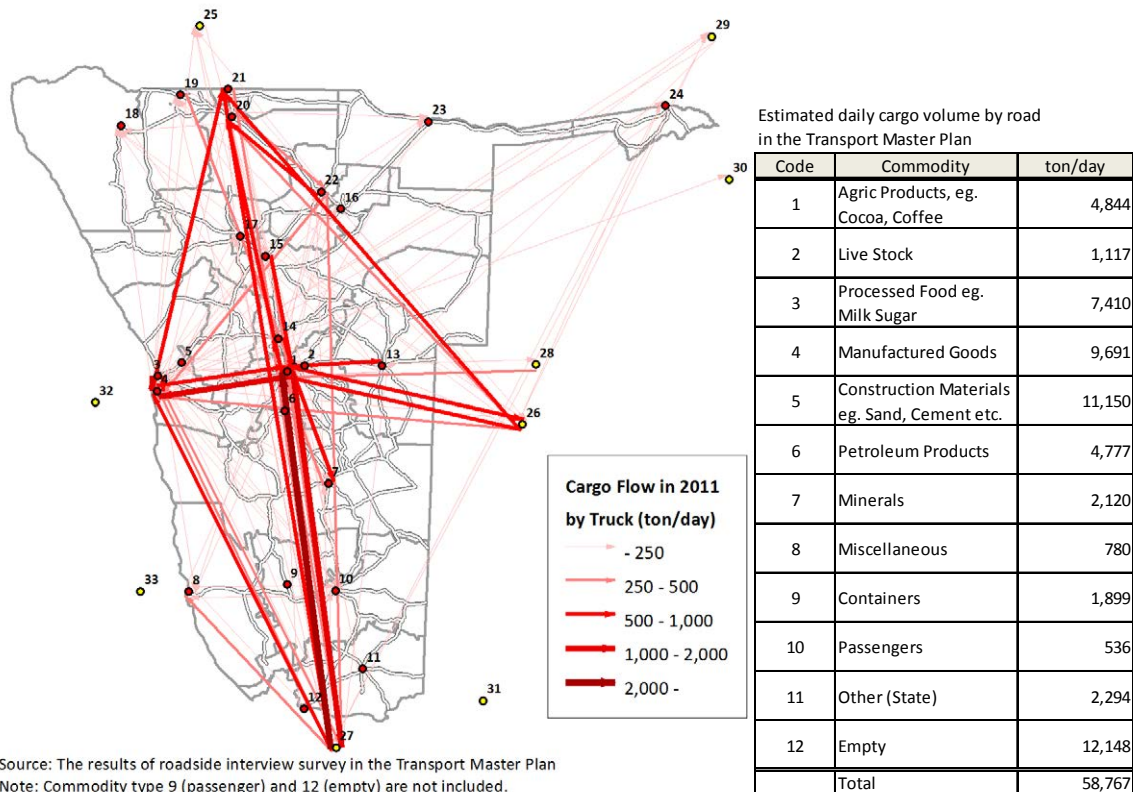


Figure 10.3: Cargo flow by truck in 2011

On the other hand, cargo flow by railway in 2011 in accordance with road transport is estimated by data on transportation results provided by TransNamib. TransNamib data includes origin and destination, not only railway station, and type of commodity. Cargo flow by railway in 2011 is estimated by identification of TAZ by origin / destination in TransNamib data and re-classification of commodity type to commodity type in the Transport Master Plan.

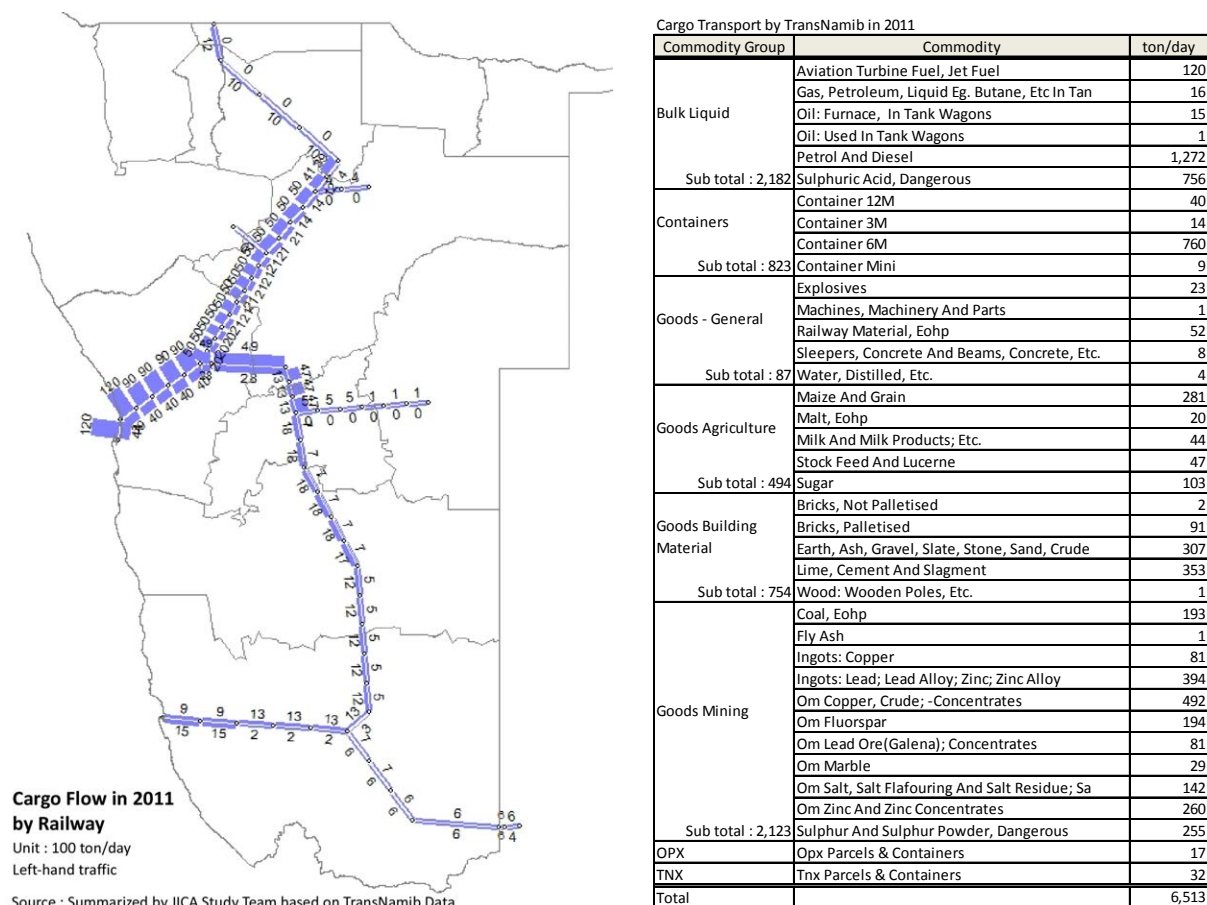


Figure 10.4: Cargo transport by rail

Total of cargo flow by road transport and railway in 2011 is the existing total cargo flow or freight OD in Namibia. Cargo generation by TAZ includes “cargo production” which indicates cargo volume produced at the zone and transported to other zones and “cargo attraction” which indicates incoming cargo volume to the zone from other zones.

In accordance with the addition of external zones such as Ariamsvlei, seaborne at Walvis Bay and Lüderitz, the existing freight OD relevant to zone 4, 8 and 32 are divided into two zones based on the customs data of 2011. For example, zone 4 in the Transport Master Plan including cargo demand at Walvis Bay Port should be divided into/between international cargo at Walvis Bay Port and domestic cargo in Walvis Bay town. Export and import volumes at Walvis Bay Port according to the customs data are considered to be international cargo flow that was generated at zone 32 (seaborne at Walvis Bay Port). The difference between existing freight OD and export/import volume at Walvis Bay Port is considered as domestic cargo flow at zone 4 (Walvis Bay town except Walvis Bay Port).

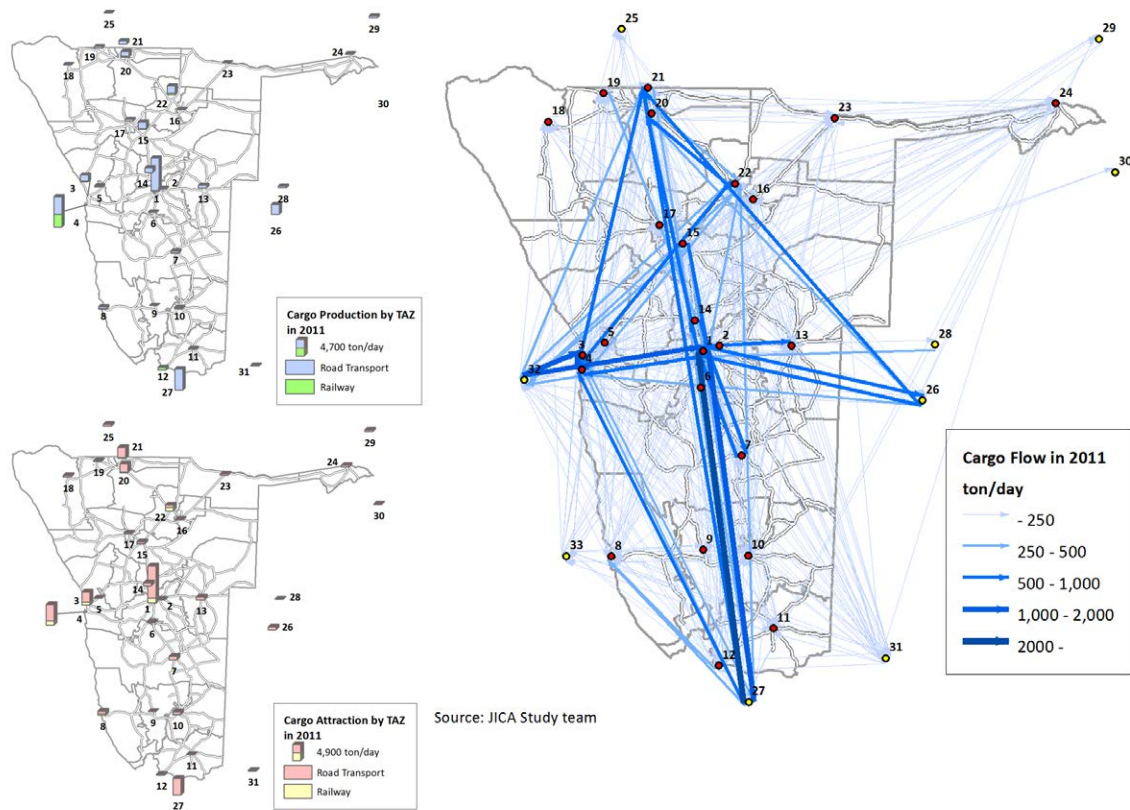


Figure 10.5: Cargo generation and flow in 2011

10.2.2 Forecast of zonal future cargo generation

Elasticity of total of export and import volumes to population growth of Namibia in 2006-2013 is 1.00, therefore, the growth of domestic cargo generation by zone is considered to be the same as the growth of population. Based on the authorized future population projection by Region issued by National Statistical Authority, the future population by zone and growth rate is calculated as shown in Table 10.1. Future cargo generation of each zone is estimated by existing cargo generation and calculated future growth rate of the population.

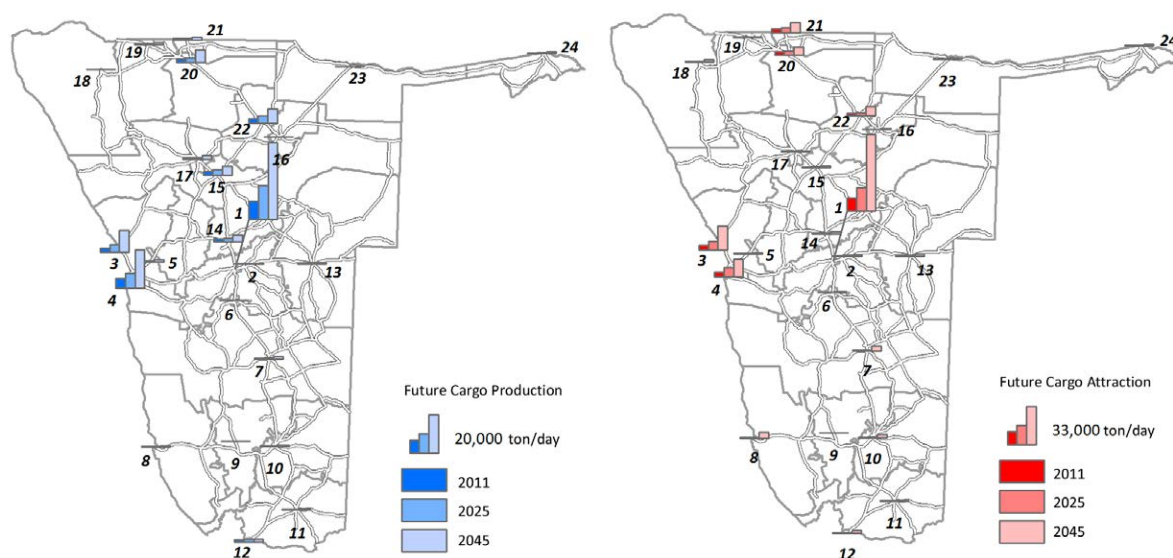
Table 10.1: Future population projection and growth rate

| TAZ | Name of zones | Population projection | | | | Annual growth rate | | | | |
|-----|---------------|-----------------------|---------|---------|---------|--------------------|---------|---------|---------|---------|
| | | 2011 | 2015 f | 2020 f | 2025 f | 2040 f | 2011-15 | 2015-20 | 2020-25 | 2025-40 |
| 1 | Windhoek | 340,997 | 400,000 | 480,000 | 563,000 | 811,000 | 4.1% | 3.7% | 3.2% | 2.5% |
| 2 | HKIA | 0 | 0 | 0 | 0 | 0 | - | - | - | - |
| 3 | Swakopmund | 66,210 | 77,000 | 92,000 | 107,000 | 151,000 | 3.8% | 3.6% | 3.1% | 2.3% |
| 4 | Walvis Bay | 62,323 | 73,000 | 87,000 | 100,000 | 142,000 | 4.0% | 3.6% | 2.8% | 2.4% |
| 5 | Karibib | 21,805 | 26,000 | 30,000 | 35,000 | 50,000 | 4.5% | 2.9% | 3.1% | 2.4% |
| 6 | Rehoboth | 29,407 | 32,000 | 35,000 | 37,000 | 46,000 | 2.1% | 1.8% | 1.1% | 1.5% |
| 7 | Mariental | 50,177 | 54,000 | 59,000 | 64,000 | 78,000 | 1.9% | 1.8% | 1.6% | 1.3% |
| 8 | Lüderitz | 13,986 | 15,000 | 17,000 | 18,000 | 23,000 | 1.8% | 2.5% | 1.1% | 1.6% |
| 9 | Bethanie | 10,672 | 12,000 | 13,000 | 14,000 | 17,000 | 3.0% | 1.6% | 1.5% | 1.3% |
| 10 | Keetmanshoop | 26,571 | 29,000 | 32,000 | 35,000 | 43,000 | 2.2% | 2.0% | 1.8% | 1.4% |
| 11 | Karasburg | 16,529 | 18,000 | 20,000 | 22,000 | 27,000 | 2.2% | 2.1% | 1.9% | 1.4% |
| 12 | Noordoewer | 9,759 | 11,000 | 12,000 | 13,000 | 16,000 | 3.0% | 1.8% | 1.6% | 1.4% |
| 13 | Gobabis | 71,478 | 74,000 | 77,000 | 79,000 | 84,000 | 0.9% | 0.8% | 0.5% | 0.4% |

| TAZ | Name of zones | Population projection | | | | | Annual growth rate | | | |
|-------|---------------|-----------------------|-----------|-----------|-----------|-----------|--------------------|---------|---------|---------|
| | | 2011 | 2015 f | 2020 f | 2025 f | 2040 f | 2011-15 | 2015-20 | 2020-25 | 2025-40 |
| 14 | Okahandja | 21,386 | 23,000 | 24,000 | 25,000 | 29,000 | 1.8% | 0.9% | 0.8% | 1.0% |
| 15 | Otjiwarongo | 111,464 | 119,000 | 127,000 | 136,000 | 161,000 | 1.6% | 1.3% | 1.4% | 1.1% |
| 16 | Grootfontein | 21,652 | 23,000 | 24,000 | 26,000 | 29,000 | 1.5% | 0.9% | 1.6% | 0.7% |
| 17 | Outjo | 12,259 | 13,000 | 15,000 | 17,000 | 23,000 | 1.5% | 2.9% | 2.5% | 2.0% |
| 18 | Opuwo | 53,525 | 59,000 | 66,000 | 74,000 | 98,000 | 2.5% | 2.3% | 2.3% | 1.9% |
| 19 | Outapi | 244,146 | 248,000 | 256,000 | 265,000 | 284,000 | 0.4% | 0.6% | 0.7% | 0.5% |
| 20 | Ondangwa | 331,111 | 351,000 | 378,000 | 406,000 | 482,000 | 1.5% | 1.5% | 1.4% | 1.2% |
| 21 | Oshikango | 246,451 | 253,000 | 265,000 | 278,000 | 313,000 | 0.7% | 0.9% | 1.0% | 0.8% |
| 22 | Tsumeb | 39,470 | 42,000 | 45,000 | 47,000 | 56,000 | 1.6% | 1.4% | 0.9% | 1.2% |
| 23 | Rundu | 224,102 | 235,000 | 250,000 | 265,000 | 312,000 | 1.2% | 1.2% | 1.2% | 1.1% |
| 24 | Katima Mulilo | 90,756 | 97,000 | 106,000 | 114,000 | 140,000 | 1.7% | 1.8% | 1.5% | 1.4% |
| Total | | 2,116,237 | 2,284,000 | 2,510,000 | 2,740,000 | 3,415,000 | 1.9% | 1.9% | 1.8% | 1.5% |

Source: Calculation by JICA Study Team based on the Population Projection by Region provided by NSA.

Forecast future cargo generation, production and attraction, is growth in accordance with population growth by zone as shown in Figure 10.6. Cargo generation which is the total of cargo production and attraction of Windhoek in 2025 is estimated to be 1.8 times that of 2011 (38,000 tons per day), and 2045 to be 5.1 times that of 2011 (106,000 tons per day).



Note: Exclude external zones

Source: JICA Study Team

Figure 10.6: Future cargo generation

10.2.3 Forecast of future cargo OD matrices

Based on the forecast future cargo generation and existing cargo OD, the future cargo OD is computed by one of the present pattern methods, the fratar method. The fratar method is represented by the following formula.

$$T_{ij} = t_{ij} \cdot \frac{G_i \cdot A_j}{g_i \cdot a_j} \cdot \frac{1}{2} \left(\frac{g_i}{\sum_j t_{ij} \cdot \frac{A_j}{a_j}} + \frac{a_j}{\sum_i t_{ij} \cdot \frac{G_i}{g_i}} \right)$$

where, T_{ij} : Future cargo flow from zone i to zone j.

t_{ij} : Existing cargo flow from zone i to zone j.

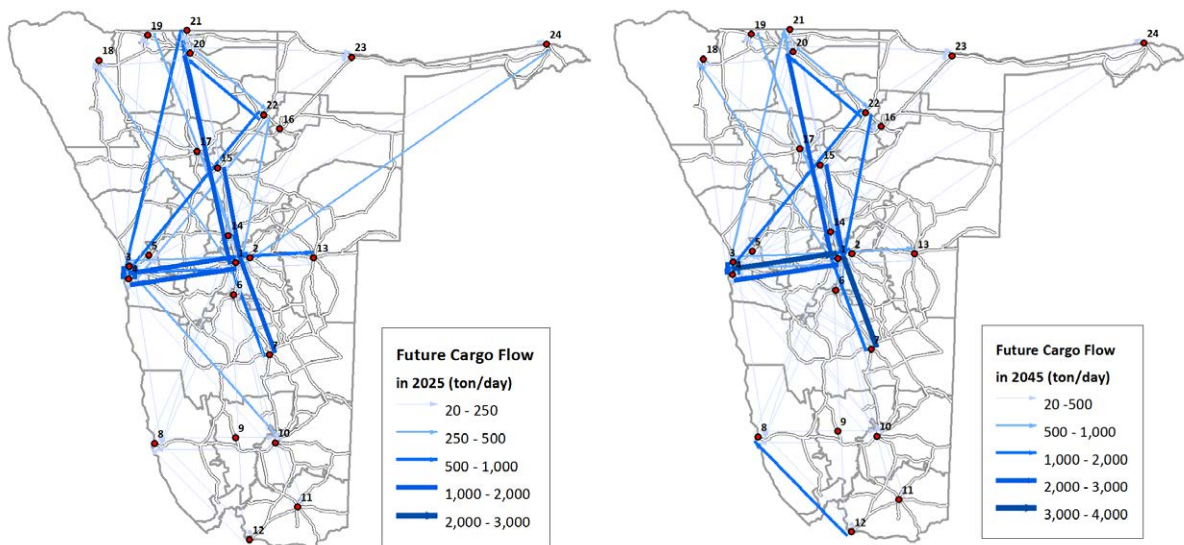
G_i : Future cargo production from zone i.

g_i : Existing cargo production from zone i.

A_j : Future cargo attraction to zone j, and

a_j : Existing cargo attraction to zone j.

Figure 10.7 shows forecast future cargo flow in 2025 and 2045 except external OD such as export, import of Namibia and transit through Namibia.



Note: Exclude external zones
Source: JICA Study Team

Figure 10.7: Future internal cargo OD

10.2.4 International cargo flow in SADC

To forecast future export, import and transit relevant to Namibia, international cargo flow in SADC is estimated. The future international cargo flow in SADC region is estimated by the following 4 steps.

- Step 1: Forecasting of future export/import volume in total based on GDP forecast and its elasticity of export/import volume in SADC member states.
- Step 2: Future export and import volume by type of commodity and export and import volume by partner are estimated by regression (with employment of the UN ComTrade data).

- Step 3: Future cargo flow in SADC region is calculated by multiplying the proportion of type of commodity by trade partner to total export or import volume and future export and import volume based on GDP elasticity of each SADC country.
- Step 4: Based on future cargo flow in SADC region, cargo flow relevant to Namibia is extracted and assigned on the proper OD pair.

Growth of international trade value and GDP has a correlation. Future growth rate of export and import volume of SADC countries is estimated from elasticity of export/import for GDP growth and forecast future GDP growth rate. Table 10.2 and Table 10.3 show estimated elasticity of export/import for GDP growth by country and direction, and forecast future GDP growth rate, respectively. Future GDP growth rates are projected in the IMF country report for 2018–2019 and forecast by the Study team by regression model afterwards.

Table 10.2: Elasticity of trade value of SADC countries for GDP growth

| Countries | Export | | Import | |
|--------------|---|---|---|---|
| | Elasticity of export value for GDP growth | Coefficient of determination R ² | Elasticity of import value for GDP growth | Coefficient of determination R ² |
| Angola | 0.775 | 0.925 | 0.822 | 0.873 |
| Botswana | 0.869 | 0.580 | 1.915 | 0.767 |
| DRC | 1.782 | 0.808 | 1.626 | 0.869 |
| Lesotho | 0.702 | 0.764 | 0.870 | 0.992 |
| Malawi | 1.264 | 0.873 | 1.177 | 0.882 |
| Mozambique | 0.796 | 0.779 | 1.498 | 0.952 |
| Namibia | 1.284 | 0.938 | 1.604 | 0.832 |
| South Africa | 1.076 | 0.806 | 0.912 | 0.645 |
| Swaziland | 0.502 | 0.777 | 0.240 | 0.249 |
| Tanzania | 1.826 | 0.973 | 1.671 | 0.923 |
| Zambia | 1.359 | 0.964 | 1.229 | 0.933 |
| Zimbabwe | 1.701 | 0.790 | 0.643 | 0.130 |

Note: Elasticity is calculated by JICA Study Team based on nominal GDP and export/import value of goods in current price by the "World Development Indicators, 2005-2012, World Bank"

Source: JICA Study Team

Table 10.3: Annual average GDP growth rate of SADC countries

| Countries | Unit: % p.a. | | | | | |
|--------------|--------------|-----------|-------------|-------------|-------------|-------------|
| | 2001-2005 | 2006-2010 | 2011-2015 f | 2016-2020 f | 2021-2025 f | 2026-2045 f |
| Angola | 10.56 | 12.59 | 5.14 | 6.26 | 5.70 | 5.32 |
| Botswana | 3.64 | 4.26 | 5.00 | 4.11 | 4.56 | 4.62 |
| DRC | 3.86 | 5.55 | 7.19 | 6.95 | 5.89 | 3.92 |
| Lesotho | 2.97 | 4.82 | 4.96 | 5.27 | 4.51 | 4.17 |
| Malawi | 2.23 | 7.09 | 5.39 | 6.55 | 6.02 | 5.38 |
| Mozambique | 8.85 | 7.24 | 7.74 | 8.36 | 8.90 | 8.85 |
| Namibia | 5.00 | 4.20 | 4.76 | 4.65 | 4.71 | 4.72 |
| South Africa | 3.84 | 3.28 | 2.83 | 3.31 | 3.07 | 3.03 |
| Swaziland | 2.11 | 2.46 | 1.62 | 1.80 | 1.71 | 1.66 |
| Tanzania | 7.05 | 6.88 | 6.92 | 6.98 | 6.95 | 6.95 |
| Zambia | 4.82 | 6.42 | 6.99 | 7.47 | 6.29 | 5.16 |
| Zimbabwe | -7.80 | -0.76 | 6.41 | 4.23 | 4.05 | 4.00 |

Note: GDP growth rates after 2011-2015 are projection by IMF's country report. Since 2016, growth rate are forecast by JICA Study Team based on IMF's projection.

Source: JICA Study Team

The forecast future trade volume of SADC countries is indicated in Table 10.4. The forecast future

trade volume is a control total of export/import of each SADC country. The growth rate of future trade volume of SADC countries is calculated by future GDP growth rate and GDP elasticity of export/import, and trade volume in 2013 that is estimated by a regression model based on the trade volume in 2000-2013 to complement missing data and to avoid abnormal data in a few countries.

Table 10.4: Forecasted future trade volume of SADC countries

Unit: million ton

| Country | Export | | | | | Import | | | | |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 2013 | 2015 f | 2020 f | 2025 f | 2045 f | 2013 | 2015 f | 2020 f | 2025 f | 2045 f |
| Angola | 96.7 | 104.1 | 132.0 | 163.9 | 367.6 | 11.0 | 11.9 | 15.3 | 19.3 | 45.3 |
| Botswana | 1.3 | 1.4 | 1.7 | 2.1 | 4.6 | 5.0 | 5.9 | 8.6 | 13.1 | 71.3 |
| DRC | 5.1 | 6.4 | 11.5 | 19.0 | 73.3 | 3.5 | 4.3 | 7.3 | 11.6 | 40.0 |
| Lesotho | 0.2 | 0.2 | 0.3 | 0.3 | 0.5 | 0.7 | 0.8 | 1.0 | 1.2 | 2.4 |
| Malawi | 1.2 | 1.4 | 2.2 | 3.1 | 11.6 | 2.2 | 2.5 | 3.6 | 5.1 | 17.5 |
| Mozambique | 3.7 | 4.2 | 5.7 | 8.1 | 31.6 | 10.0 | 12.7 | 22.9 | 42.8 | 102.6 |
| Namibia | 3.3 | 3.7 | 4.9 | 6.6 | 21.3 | 5.5 | 6.3 | 9.1 | 13.1 | 56.3 |
| South Africa | 176.0 | 188.0 | 223.9 | 263.4 | 500.0 | 57.9 | 61.2 | 71.0 | 81.5 | 140.5 |
| Swaziland | 4.2 | 4.3 | 4.5 | 4.7 | 5.6 | 2.8 | 2.8 | 2.9 | 2.9 | 3.2 |
| Tanzania | 2.7 | 3.5 | 6.3 | 11.5 | 33.9 | 10.8 | 13.5 | 23.5 | 40.6 | 119.9 |
| Zambia | 3.3 | 4.0 | 6.6 | 9.9 | 38.3 | 5.5 | 6.6 | 10.2 | 14.8 | 50.5 |
| Zimbabwe | 1.7 | 1.9 | 2.6 | 3.7 | 13.7 | 5.6 | 5.8 | 6.7 | 7.6 | 12.6 |

Note: Export and import volumes in 2013 are estimation.

Source: JICA Study Team

Based on UN ComTrade data, the proportion of trade volume by commodity type and trade partner to total export or import volume of each SADC country is calculated for 2000 – 2013. The future proportion of commodity and partner by direction is estimated by regression analysis.

Future cargo OD in SADC region is calculated by multiplying the share of commodity by partner and export or import volume of each SADC country.

Table 10.5: Forecast Namibia's future trade by Commodities

Unit: 1,000 ton per year

| | Export | | | | Import | | | |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 2015 f | 2020 f | 2025 f | 2045 f | 2015 f | 2020 f | 2025 f | 2045 f |
| 1.Agricultural products | 118 | 141 | 187 | 598 | 599 | 806 | 1,129 | 4,784 |
| 2.Livestock | 431 | 537 | 738 | 2,376 | 88 | 139 | 212 | 924 |
| 3.Processed food | 52 | 63 | 78 | 271 | 596 | 707 | 873 | 3,830 |
| 4.Manufactured goods | 993 | 1,327 | 1,730 | 5,348 | 1,318 | 1,797 | 2,424 | 9,876 |
| 5.Construction materials | 62 | 64 | 70 | 246 | 472 | 585 | 818 | 3,583 |
| 6.Petroleum products | 110 | 155 | 218 | 913 | 1,510 | 2,410 | 3,708 | 16,266 |
| 7.Minerals | 1,634 | 2,226 | 3,013 | 9,810 | 433 | 724 | 1,146 | 4,996 |
| 8.Miscellaneous | 26 | 36 | 50 | 165 | 70 | 83 | 116 | 335 |
| 9.Containers | 140 | 197 | 280 | 895 | 1,103 | 1,638 | 2,395 | 10,508 |
| 11.Other | 97 | 147 | 199 | 656 | 158 | 207 | 269 | 1,195 |
| Total | 3,661 | 4,893 | 6,562 | 21,278 | 6,348 | 9,097 | 13,090 | 56,295 |

Note: Transit is not included.

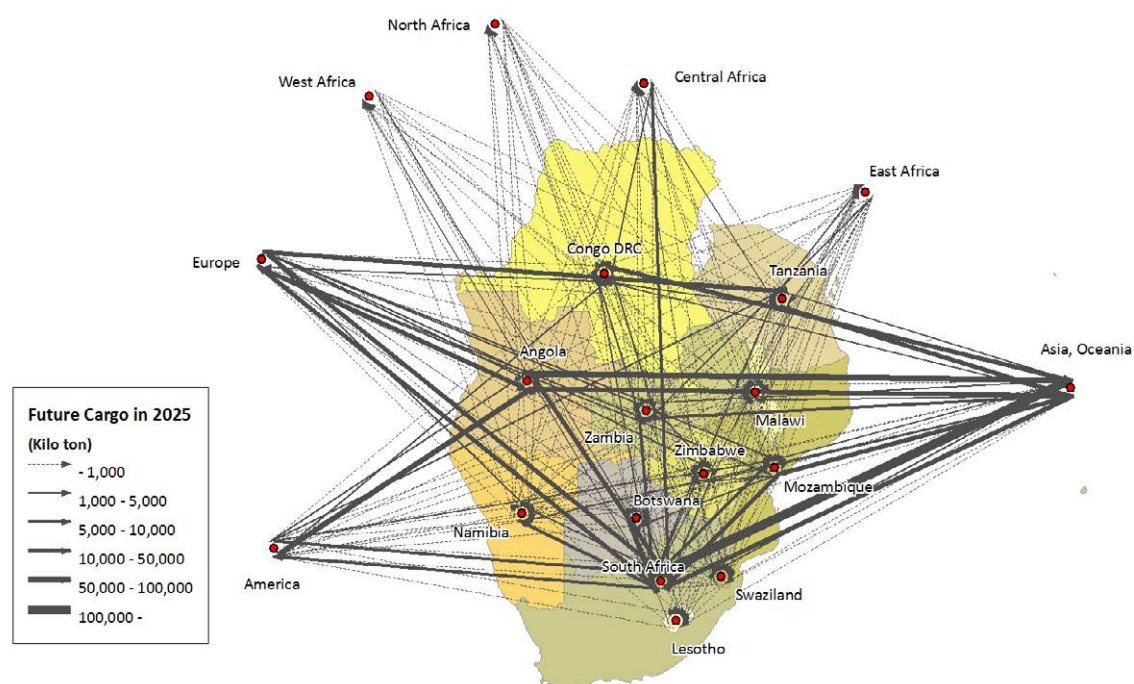
Source: JICA Study Team

Table 10.6: Forecast Namibia's future trade by partners

Unit: 1,000 ton per year

| Trade partner (countries and regions) | Export | | | | Import | | | |
|--|--------------|--------------|--------------|---------------|--------------|--------------|---------------|---------------|
| | 2015 f | 2020 f | 2025 f | 2045 f | 2015 f | 2020 f | 2025 f | 2045 f |
| Countries | | | | | | | | |
| Angola | 329 | 437 | 567 | 1,680 | 2 | 4 | 7 | 32 |
| Botswana | 81 | 124 | 198 | 1,059 | 61 | 110 | 180 | 787 |
| DRC | 244 | 428 | 704 | 2,417 | 5 | 10 | 17 | 71 |
| Lesotho | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Malawi | 0 | 1 | 3 | 10 | 1 | 2 | 3 | 12 |
| Mozambique | 38 | 56 | 86 | 212 | 48 | 84 | 140 | 618 |
| Swaziland | 86 | 89 | 90 | 97 | 10 | 16 | 25 | 103 |
| Tanzania | 3 | 7 | 9 | 32 | 50 | 92 | 151 | 671 |
| Zambia | 150 | 250 | 372 | 1,217 | 134 | 237 | 379 | 1,646 |
| Zimbabwe | 25 | 36 | 54 | 173 | 6 | 5 | 5 | 28 |
| Regions | | | | | | | | |
| America | 159 | 224 | 308 | 996 | 127 | 172 | 264 | 1,164 |
| Asia | 309 | 440 | 616 | 1,991 | 665 | 1,043 | 1,588 | 6,958 |
| Central Africa | 405 | 507 | 639 | 2,058 | 0 | 0 | 0 | 2 |
| East Africa | 7 | 11 | 16 | 54 | 4 | 8 | 12 | 58 |
| Europe | 568 | 664 | 765 | 2,463 | 1,016 | 1,585 | 2,409 | 10,570 |
| North Africa | 1 | 4 | 5 | 15 | 13 | 24 | 41 | 172 |
| South Africa | 1,244 | 1,599 | 2,107 | 6,728 | 4,180 | 5,661 | 7,802 | 33,113 |
| West Africa | 9 | 15 | 21 | 66 | 8 | 12 | 15 | 62 |
| Unknown | 2 | 3 | 4 | 10 | 19 | 32 | 52 | 228 |
| Total | 3,661 | 4,893 | 6,562 | 21,278 | 6,348 | 9,097 | 13,090 | 56,295 |

Source: JICA Study Team



Source: JICA Study Team

Figure 10.8: Future cargo OD in SADC region

Trade flows relevant to Namibia are extracted from forecast future trade in SADC region. Considering existing customs data and cross-border cargo data through Walvis Bay Port, OD pairs in

the following table are extracted and assigned by proper external zone.

Concerning transit cargo through Namibia, two cases are assumed:

- Base case: Existing ratios of transit volume through Namibia to potential demand are applied.
- Maximum case: 100% of potential demand such as international trade between Zambia and Europe/America through Namibia via Walvis Bay Port.
- Target: this Study set a target for future transit transport volume by assuming the target volume share in landlocked areas of SADC.

Based on the forecast future cargo OD, transit cargo passing through Namibia is summarized in Table 10.7, Table 10.8 and Table 10.9. Figure 10.9 shows the target cargo flow in 2013, 2025 and 2045.

Table 10.7: Forecast cargo volume by corridors (base case)

Unit: million ton per year

| Corridors | 2013 | 2025 | 2045 | Annual average growth rate 2013-2025 | Annual average growth rate 2025-2045 |
|---|------------|------------|-------------|--------------------------------------|--------------------------------------|
| Walvis Bay–Ndola–Lubumbashi Development Corridor (WNLDC) | 0.8 | 2.2 | 13.3 | 9.0% | 9.5% |
| Transit cargo between Zambia and Walvis Bay Port | 0.3 | 1.2 | 5.3 | 11.1% | 8.0% |
| Regional trade (Namibia - Zambia/DRC/Zimbabwe) | 0.4 | 1.0 | 8.0 | 7.2% | 10.9% |
| Trans-Kalahari Corridor | 2.5 | 6.2 | 36.5 | 7.5% | 9.3% |
| Transit cargo between Buitepos and Angola | 0.8 | 2.5 | 8.0 | 9.8% | 6.1% |
| Transit cargo between Buitepos and Walvis Bay Port | 0.1 | 0.4 | 1.4 | 9.5% | 7.1% |
| Regional trade (Namibia - Botswana/South Africa) | 1.6 | 3.4 | 27.1 | 6.0% | 11.0% |
| Trans-Orange Corridor | 2.6 | 5.9 | 19.7 | 7.3% | 6.2% |
| Transit cargo between Noorderw/Ariamsvlei and Walvis Bay Port | 0.0 | 0.0 | 0.2 | 7.5% | 7.4% |
| Transit cargo between Noorderw/Ariamsvlei and Angola | 0.3 | 1.9 | 3.1 | 16.1% | 2.4% |
| Regional trade (Namibia - South Africa) | 2.3 | 3.9 | 16.3 | 4.9% | 7.4% |
| Trans-Cunene Corridor | 0.8 | 2.9 | 6.4 | 11.2% | 4.0% |
| Transit cargo between Walvis Bay and Angola | 0.4 | 0.7 | 2.9 | 6.4% | 7.1% |
| Regional trade (Namibia - Angola) | 0.5 | 2.2 | 3.5 | 13.7% | 2.4% |

Source: JICA Study Team

Table 10.8: Forecast cargo volume by corridors (maximum case)

Unit: million ton per year

| Corridors | 2013 | 2025 | 2045 | Annual Average Growth Rate 2013-2025 | Annual Average Growth Rate 2025-2045 |
|---|------------|------------|-------------|--------------------------------------|--------------------------------------|
| Walvis Bay–Ndola–Lubumbashi Development Corridor (WNLDC) | 0.8 | 6.4 | 25.0 | 19.3% | 7.1% |
| Transit cargo between Zambia and Walvis Bay Port | 0.3 | 5.4 | 17.0 | 26.3% | 5.9% |
| Regional trade (Namibia - Zambia/DRC/Zimbabwe) | 0.4 | 1.0 | 8.0 | 7.2% | 10.9% |
| Trans-Kalahari Corridor | 2.5 | 6.2 | 36.8 | 7.6% | 9.3% |
| Transit cargo between Buitepos and Angola | 0.8 | 2.5 | 8.0 | 9.8% | 6.1% |
| Transit cargo between Buitepos and Walvis Bay Port | 0.1 | 0.4 | 1.7 | 11.1% | 7.1% |
| Regional trade (Namibia - Botswana/South Africa) | 1.6 | 3.4 | 27.1 | 6.0% | 11.0% |
| Trans-Orange Corridor | 2.6 | 5.9 | 19.7 | 7.3% | 6.2% |
| Transit cargo between Noorderw/Ariamsvlei and Walvis Bay Port | 0.0 | 0.0 | 0.2 | 7.3% | 7.4% |
| Transit cargo between Noorderw/Ariamsvlei and Angola | 0.3 | 1.9 | 3.1 | 16.1% | 2.4% |
| Regional trade (Namibia - South Africa) | 2.3 | 3.9 | 16.3 | 4.9% | 7.4% |
| Trans-Cunene Corridor | 0.8 | 2.9 | 6.4 | 11.2% | 4.0% |
| Transit cargo between Walvis Bay and Angola | 0.4 | 0.7 | 2.9 | 6.4% | 7.1% |
| Regional trade (Namibia - Angola) | 0.5 | 2.2 | 3.5 | 13.7% | 2.4% |

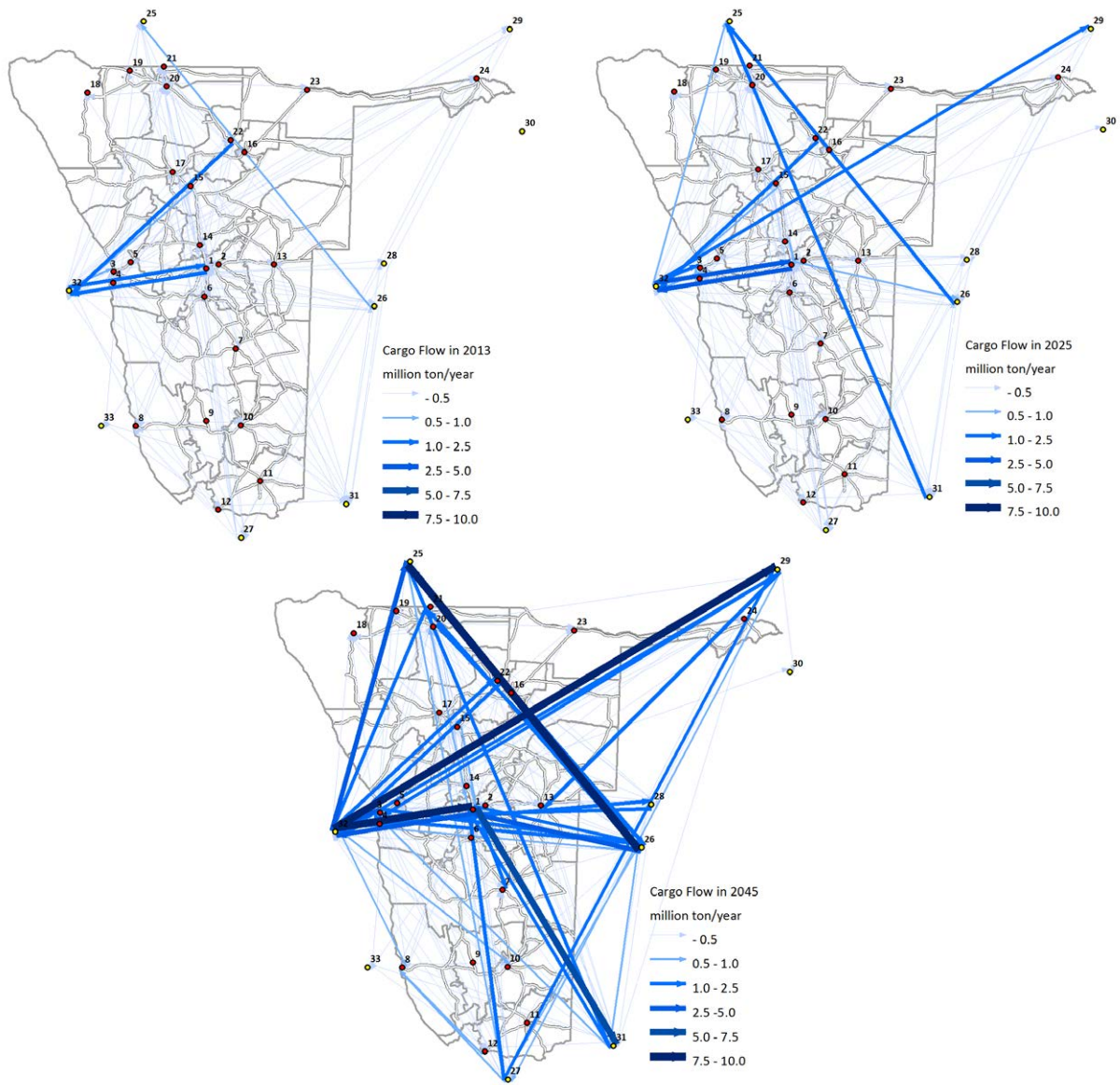
Source: JICA Study Team

Table 10.9: Forecast cargo volume by corridors (target)

Unit: million ton per year

| Corridors | 2013 | 2025 | 2045 | Annual average growth rate 2013-2025 | Annual average growth rate 2025-2045 |
|---|------------|------------|-------------|--------------------------------------|--------------------------------------|
| Walvis Bay–Ndola–Lubumbashi Development Corridor (WNLDC) | 0.8 | 3.4 | 18 | 13.2% | 9.5% |
| Transit cargo between Zambia and Walvis Bay Port | 0.3 | 2.4 | 10 | 18.1% | 8.0% |
| Regional trade (Namibia - Zambia/DRC/Zimbabwe) | 0.4 | 1 | 8 | 7.2% | 10.9% |
| Trans-Kalahari | 2.5 | 6.2 | 36.5 | 7.6% | 9.3% |
| Transit cargo between Buitepos and Angola | 0.8 | 2.5 | 8 | 9.8% | 6.1% |
| Transit cargo between Buitepos and Walvis Bay Port | 0.1 | 0.4 | 1.4 | 11.1% | 7.1% |
| Regional trade (Namibia - Botswana/South Africa) | 1.6 | 3.4 | 27.1 | 6.0% | 11.0% |
| Trans-Orange | 2.6 | 5.9 | 19.7 | 7.3% | 6.2% |
| Transit cargo between Noordower/Ariamsvlei and Walvis Bay Port | 0.0 | 0.0 | 0.2 | 7.5% | 7.4% |
| Transit cargo between Noordower/Ariamsvlei and Angola | 0.3 | 1.9 | 3.1 | 16.1% | 2.4% |
| Regional trade (Namibia - South Africa) | 2.3 | 3.9 | 16.3 | 4.9% | 7.4% |
| Trans-Cunene | 0.8 | 2.9 | 6.4 | 11.2% | 4.0% |
| Transit cargo between Walvis Bay and Angola | 0.4 | 0.7 | 2.9 | 6.4% | 7.1% |
| Regional trade (Namibia - Angola) | 0.5 | 2.2 | 3.5 | 13.8% | 2.4% |

Source: JICA Study Team



Source: JICA Study Team

Figure 10.9: Future cargo flow (target)

The newly defined external zones 32 and 33 are seaborne at Walvis Bay Port and Lüderitz Port respectively. Table 10.10 and Table 10.11 show forecast future export, import and transit volumes of those two port zones.

Table 10.10: Forecast import and export volume at Walvis Bay Port (target)

Unit: million ton per year

| Cargo items | 2013 e | | 2025 f | | 2045 f | |
|--|------------|------------|------------|-------------|-------------|-------------|
| | Import | Export | Import | Export | Import | Export |
| 1. Agricultural products, eg. Cocoa and coffee | 0.1 | 0.3 | 0.2 | 0.6 | 0.5 | 1.9 |
| 2. Livestock, eg. Cattle | 0.2 | 0.0 | 0.3 | 0.1 | 0.2 | 0.8 |
| 3. Processed food eg. Milk and sugar | 0.0 | 0.3 | 0.0 | 0.4 | 0.8 | 1.3 |
| 4. Manufactured goods | 0.5 | 0.6 | 0.7 | 1.4 | 0.8 | 8.6 |
| 5. Construction materials eg. Sand and cement | 0.0 | 0.1 | 0.0 | 0.4 | 1.3 | 0.7 |
| 6. Petroleum products | 2.6 | 1.7 | 4.9 | 3.6 | 5.5 | 5.0 |
| 7. Minerals | 0.6 | 0.2 | 1.0 | 1.1 | 0.9 | 8.0 |
| 8. Miscellaneous | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.4 |
| 9. Containers | 0.0 | 0.7 | 0.1 | 1.9 | 0.0 | 5.9 |
| 11. Other | 0.0 | 0.1 | 0.0 | 0.5 | 0.0 | 2.9 |
| Total | 4.0 | 4.0 | 7.3 | 10.1 | 10.0 | 35.5 |

Note: Transit through Walvis Bay Port is included. Transshipment is not included.

Source: JICA Study Team

Table 10.11: Forecast import and export volume at Lüderitz Port (Ttarget)

Unit: million ton per year

| Cargo items | 2013 e | | 2025 f | | 2045 f | |
|---|------------|------------|------------|------------|------------|------------|
| | Import | Export | Import | Export | Import | Export |
| 1. Agricultural Products, eg. Cocoa, Coffee | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2. Livestock, eg. Cattle | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3. Processed Food eg. Milk Sugar | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4. Manufactured Goods | 0.1 | 0.0 | 0.1 | 0.0 | 0.5 | 0.0 |
| 5. Construction Materials eg. Sand, Cement etc. | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6. Petroleum Products | 0.0 | 0.2 | 0.0 | 0.2 | 0.0 | 0.1 |
| 7. Minerals | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.3 |
| 8. Miscellaneous | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9. Containers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11. Other | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 0.2 | 0.3 | 0.2 | 0.3 | 0.6 | 0.4 |

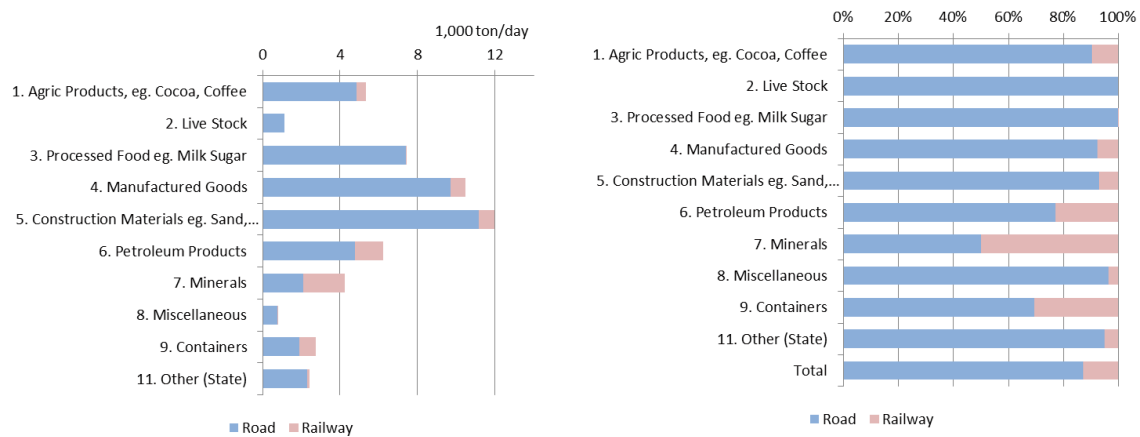
Note: Transit through Walvis Bay Port is included. Transshipment is not included.

Source: JICA Study Team

10.3 Freight demand by transport mode

10.3.1 Assumption of modal share

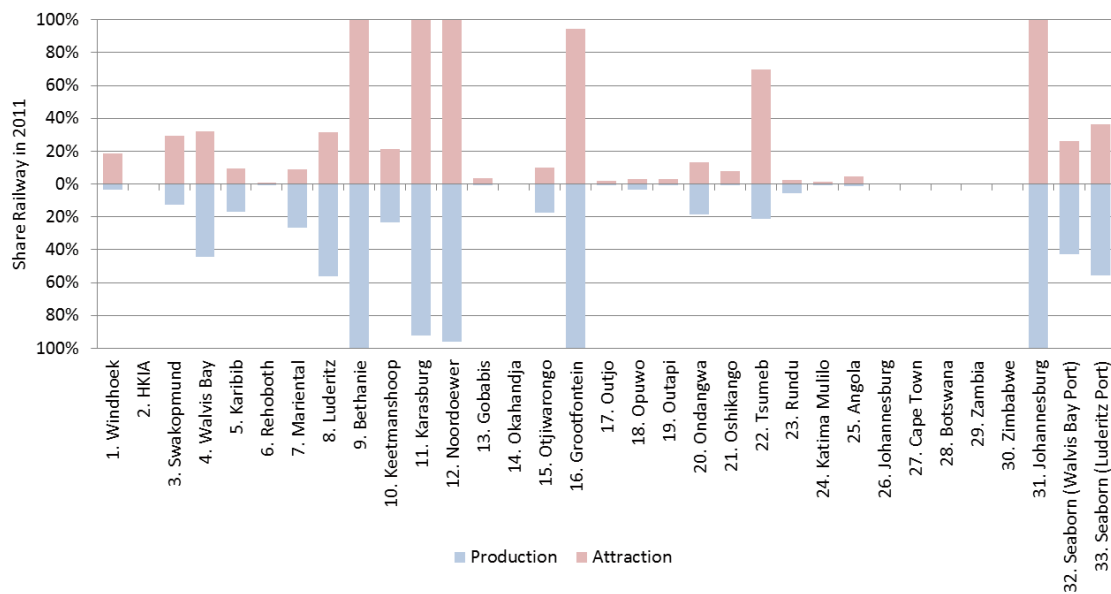
Based on the results of the road interview survey carried in the Transport Master Plan and transport results provided by TransNamib, the transported volume in 2011 are estimated as shown in Figure 10.10. The average share of railway is 12.6% of cargo by land transport in 2011.



Note: Commodity type 9 (passenger) and 12 (empty) are not included.
Source: JICA Study Team

Figure 10.10: Cargo transport results in 2011 by mode

On the other hand, the existing share of railway by origin or destination is affected by railway line and service as shown in Figure 10.11.



Source: JICA Study Team

Figure 10.11: Share of railway by zonal cargo generation in 2011

To consider the future modal share between road and railway, the geometric mean of share of origin zone, destination zone and type of commodity is applied.

$$R_{cij} = \sqrt[3]{R_c \cdot R_i \cdot R_j}$$

where, R_{cij} : Share of railway for commodity c from zone i to zone j.

R_c : Share of railway for commodity c.

R_i : Share of railway from zone i, and

R_j : Share of railway to zone j.

Based on the calculation, the share of railway in 2011 is 12.2% and approximately the actual share of 12.6% based on the TransNamib data and roadside interview survey by the Transport Master Plan. The calculated future cargo volume by mode is summarized in Table 10.12.

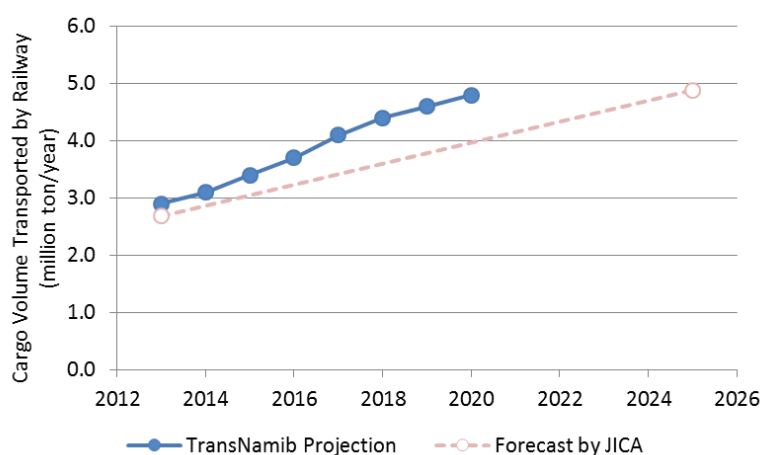
Table 10.12: Future total cargo volume relevant to Namibia (existing modal share case)

Unit: million ton per year

| Modes | 2013 | | 2025 f | |
|---------|------|----------|--------|----------|
| Railway | 2.7 | (12.2%) | 4.9 | (12.2%) |
| Road | 19.6 | (87.9%) | 35.6 | (87.9%) |
| Total | 22.2 | (100.0%) | 40.5 | (100.0%) |

Source: JICA Study Team

The future cargo volume by railway projected by TransNamib will reach 4.8 million tonnes in 2020. The future cargo volume transported by railway is 4.9 million tonnes in 2025 based on forecasting of future cargo flow and current modal split ratio.



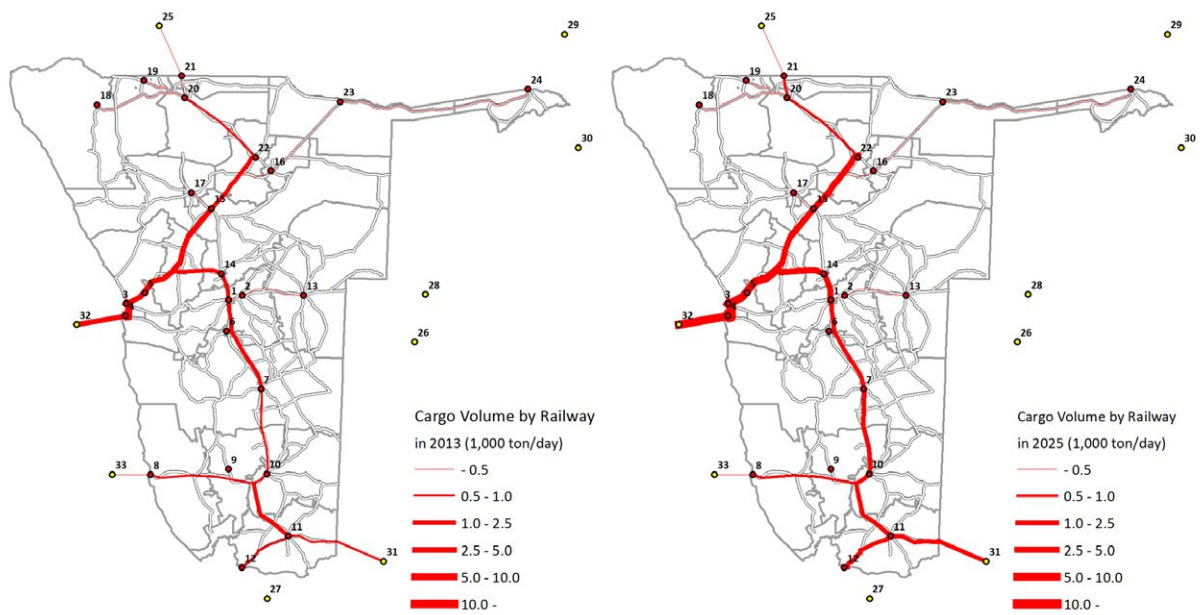
Source: JICA Study Team

Figure 10.12: Future cargo transport projected by TransNamib

10.3.2 Existing modal share case

10.3.2.1 Cargo transport by railway

The forecasted future cargo OD matrices and the assumed existing modal share by OD and commodity, future railway OD are forecast. The future assigned cargo volume by railway in 2013 and 2025 is calculated by base case cargo OD matrices and existing modal share in 2011 is shown in Figure 10.13.



Note: The figures include road transport to access railway station.
Source: JICA Study Team

Figure 10.13: Future rail cargo transport (existing modal share case)

Future cargo demand of railway at the same modal share with 2011 is summarized in Table 10.13.

Table 10.13: Forecast cargo demand for rail at major sections (existing modal share case)

Unit: ton per day

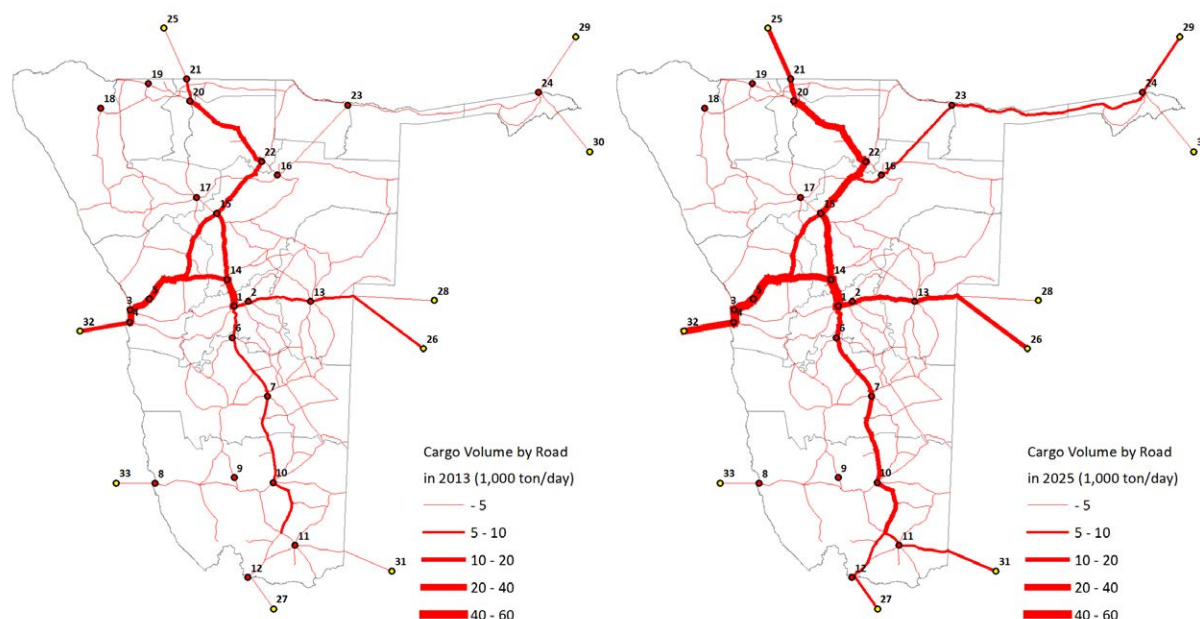
| Sections | | Length (km) | 2013 | 2025 f |
|--------------|--------------|-------------|-------|--------|
| Swakopmund | Walvis Bay | 50.3 | 5,230 | 10,220 |
| Kranzberg | Swakopmund | 161.5 | 4,700 | 8,650 |
| Okahandja | Kranzberg | 139.9 | 2,170 | 4,960 |
| Windhoek | Okahandja | 72.7 | 2,190 | 4,980 |
| Gobabis | Windhoek | 226.1 | 50 | 90 |
| Rehoboth | Windhoek | 94.2 | 1,110 | 1,780 |
| Mariental | Rehoboth | 177.2 | 1,110 | 1,770 |
| Keetmanshoop | Mariental | 231.5 | 950 | 1,550 |
| Keetmanshoop | Lüderitz | 865.6 | 710 | 940 |
| Karasburg | Keetmanshoop | 227.3 | 1,120 | 1,370 |
| Ariamsvlei | Karasburg | 135.6 | 840 | 1,290 |
| Kranzberg | Otavi | 327.6 | 2,530 | 3,690 |
| Otavi | Grootfontein | 94.8 | 100 | 140 |
| Otavi | Tsumeb | 61.3 | 2,000 | 3,060 |
| Tsumeb | Ondangwa | 247.3 | 560 | 880 |
| Ondangwa | Oshikango | 56.7 | 340 | 570 |

Note: Total of both directions of assignment results of base case with existing modal share. Cargo volume in 2013 is actual average daily transport in 2013 based on TransNamib data.

Source: JICA Study Team

10.3.2.2 Cargo transport by road

The cargo OD for road transport is difference between cargo OD before modal split and cargo OD for railways. Figure 10.14 shows the results of future cargo demand assignment for road transport.



Source: JICA Study Team

Figure 10.14: Cargo transport by road in 2013 and 2025 (existing modal share case)

Table 10.14: Forecast cargo demand for road at major sections (existing modal share case)

| Sections | | Unit: ton per day | |
|--------------|---------------|-------------------|--------|
| | | 2013 | 2025 f |
| Swakopmund | Walvis Bay | 23,190 | 45,920 |
| Usakos | Swakopmund | 20,950 | 40,600 |
| Okahandja | Karibib | 10,800 | 21,850 |
| Windhoek | Okahandja | 24,450 | 47,890 |
| Gobabis | HKIA | 8,170 | 17,200 |
| Rehoboth | Windhoek | 8,720 | 17,760 |
| Mariental | Rehoboth | 8,370 | 17,360 |
| Keetmanshoop | Mariental | 6,650 | 15,250 |
| Keetmanshoop | Luderitz | 1,370 | 1,510 |
| Karasburg | Keetmanshoop | 6,440 | 14,750 |
| Ariamsvlei | Karasburg | 3,200 | 8,850 |
| Usakos | Otjiwarongo | 10,230 | 18,850 |
| Otavi | Grootfontein | 2,940 | 9,860 |
| Otavi | Tsumeb | 15,010 | 28,000 |
| Tsumeb | Ondangwa | 11,500 | 23,660 |
| Ondangwa | Oshikango | 8,000 | 19,310 |
| Grootfontein | Rundu | 2,960 | 9,900 |
| Rundu | Katima Mulilo | 2,650 | 9,620 |

Note: Total of both directions of assignment results of base case with existing modal share.

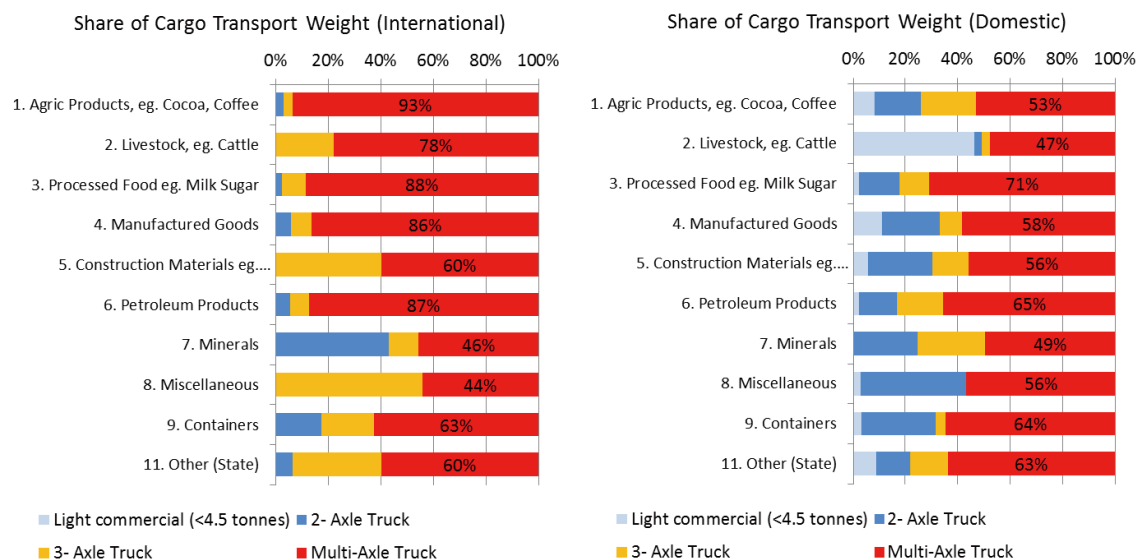
Cargo volume in 2011 is estimated by the data prepared by the Transport Master Plan.

Source: JICA Study Team

The cargo volume transported by road should be converted to vehicular volume to confirm the balance of traffic demand and capacity of the road. Cargo OD for road is converted to vehicular OD in the following steps.

- Cargo OD by type of commodity is divided into type of truck by share of existing transport volume by type of truck and type of commodity based on the results of the roadside interview survey by the Transport Master Plan.
- Vehicular OD of trucks is calculated by cargo OD by type of truck and average loading tonnage by type of truck based on the roadside interview survey by the Transport Master Plan.

- Empty truck OD is estimated by empty truck ratio and vehicular OD of loading truck.
- Integrated vehicular OD is calculated by truck OD including empty truck and passenger vehicle OD consists of passenger cars and buses prepared by the Transport Master Plan.



Source: JICA Study Team calculated by the results of roadside interview survey in the Transport Master Plan.

Figure 10.15: Share of cargo transport weight by type of trucks

Table 10.15: Average loading ton and empty ratio by type of trucks

| Type of truck | Average loading ton per truck (net) | Empty truck ratio |
|--------------------------------|-------------------------------------|-------------------|
| Light commercial (<4.5 tonnes) | 4.5 | 27.8% |
| 2 axle truck | 12.7 | 27.1% |
| 3 axle truck | 19.2 | 13.0% |
| Multi axle truck | 24.2 | 20.0% |

Source: JICA Study Team calculated by the results of roadside interview survey in the Transport Master Plan.

Heavy vehicles such as large buses, heavy trucks and trailer trucks occupy a larger road area and maintain a lower travel speed than passenger cars such as sedans, therefore, they cause a reduction of road capacity and service level of roads. Passenger Car Unit (PCU) or Passenger Car Equivalent (PCE) is a conversion factor to evaluate the impact of heavy vehicles. In this Study, PCU of each vehicle class is defined as shown in Table 10.16.

Table 10.16: Definition of passenger car unit (PCU)

| Vehicle type | PCU |
|------------------------------|-----|
| Passenger car | 1.0 |
| Medium buses | 1.3 |
| Large buses | 3.0 |
| Light commercial (<4.5 tons) | 1.0 |
| 2 axle truck | 2.0 |
| 3 axle truck | 3.0 |
| Multi axle truck | 4.0 |

Source: JICA Study Team defined from other relevant survey including JICA projects.

The existing road network was prepared by the Integrated Transport Master Plan. For the traffic

assignment on the road network, link attributes such as capacity and travel speed of road are defined as Table 10.17 based on the Highway Capacity Manual (HCM).

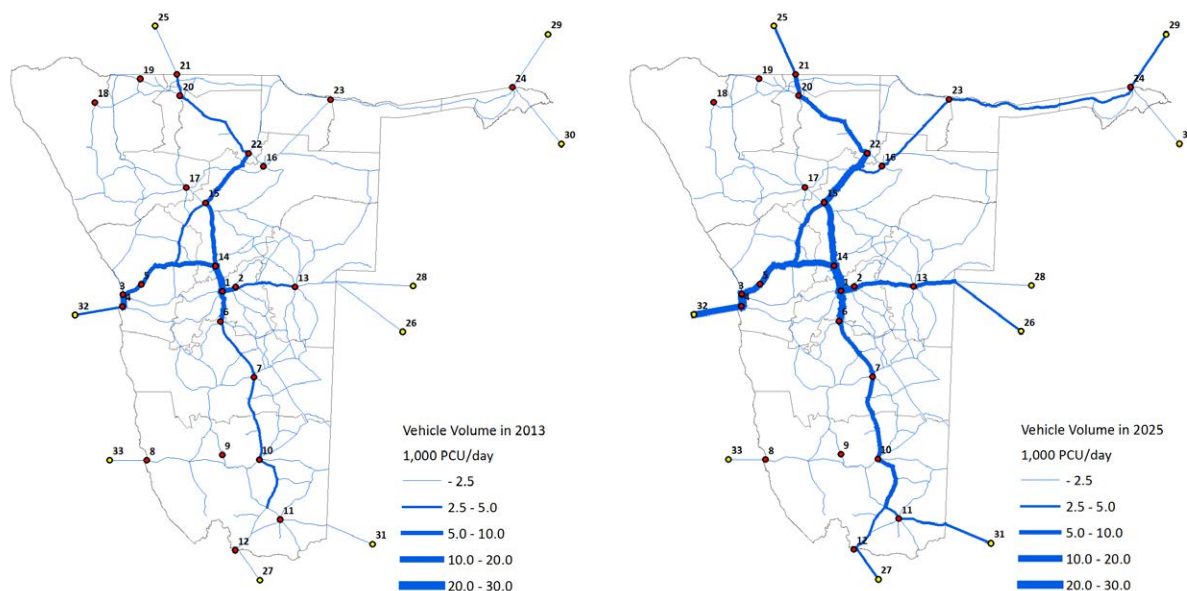
Table 10.17: Definition of road condition

| | | Trunk road | | | Main road | |
|---|-------------------|---------------------|---------------------|-----------|---------------------|-----------|
| | | 4 lanes for two-way | 2 lanes for two-way | | 2 lanes for two-way | |
| | | Paved | Paved | Not paved | Paved | Not paved |
| a) Basic Capacity (PCU/hour) | | 8,800 | 2,500 | 2,500 | 2,500 | 2,500 |
| b) Adjustment factors | Pavement | 1.00 | 1.00 | 0.35 | 1.00 | 0.35 |
| | Lateral clearance | 1.00 | 1.00 | 0.91 | 0.98 | 0.86 |
| | Heavy vehicle | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| | Parking friction | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| c) = a*b Possible Capacity (PCU/hour) | | 7,200 | 2,000 | 600 | 2,000 | 600 |
| d) Adjustment factor | Peak ratio | 12% | 12% | 12% | 12% | 12% |
| e) = c/d Possible Capacity (PCU/day) | | 60,000 | 16,600 | 5,000 | 16,600 | 5,000 |
| f) Adjustment factor | Signal factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| g) = e*f Assignment Capacity (PCU/day) | | 60,000 | 16,600 | 5,000 | 16,600 | 5,000 |
| Maximum Speed (Passenger car) | | km/h | 120 | 120 | 70 | 120 |
| Maximum Speed (Buses) | | km/h | 100 | 100 | 60 | 100 |
| Maximum Speed (Heavy trucks) | | km/h | 80 | 80 | 50 | 80 |

Source: JICA Study Team based on Highway Capacity Manual

The future road network in 2025 includes the road improvement project between Windhoek and Okahandja (expansion to two lanes for each direction).

As a result of traffic demand assignment on the road network, heavy traffic volumes are found on Windhoek – Okahandja, and Walvis Bay – Swakopmund in 2013. In 2025, the traffic volume on Windhoek – Okahandja is expected to be 16,260 vehicles per day.



Source: JICA Study Team

Figure 10.16: Vehicle volume in 2013 and 2025 (existing modal share case)

Table 10.18 and Table 10.19 indicate traffic volume on major road sections in 2013 and 2025 (existing

modal share case). Traffic volumes of passenger cars, medium buses, large bus and light truck are extracted from Namibia Integrated Transport Master Plan. Traffic volume of heavy trucks such as 2 axels truck, 3 axels truck and multi axels trucks are forecast by JICA Study Team. The traffic volume on Walvis Bay – Swakopmund is expected to increase from 9,100 vehicles in 2013 to 18,750 vehicles per day in 2025 (existing modal share case).

As indicated in Table 10.18, estimated daily traffic volume Karibib – Arandis (5,430) is higher than that between Arandis – Swakopmund (5,080). This does not match with common observation and intuitive impression of traffic volumes of respective sections. For example, it is more natural to expect the traffic volume of Arandis – Swakopmund is higher than the one in Karibib – Arandis because of mining activity which generates traffic between Arandis and Swakopmund. Roads Authority also pointed out that the figures estimated by the Integrated Transport Master Plan do not match with Roads Authority’s data as well.

The future daily traffic volumes Karibib – Arandis are also higher than Arandis – Swakopmund as indicated in Table 10.19. Figure 10.17 shows traffic condition in 2013 and in 2025 (existing modal share case).

Table 10.18: Traffic volume on major road sections in 2013

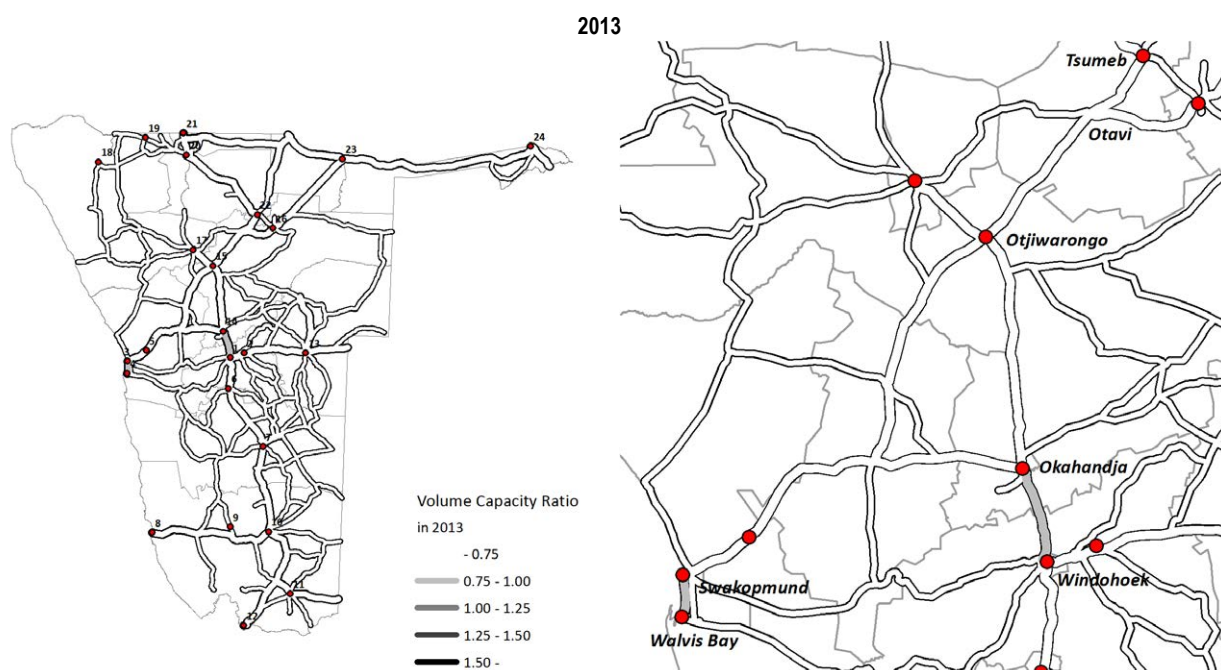
| Sections | | No of lanes | Daily traffic volume (Vehicle/day) | | | | | | Total (vehicle/day) | |
|--------------|---------------|-------------|------------------------------------|------------|-----------|-------------|--------------|--------------|---------------------|------------------|
| | | | Passenger car | Medium bus | Large bus | Light truck | 2 axle truck | 3 axle truck | | Multi axle truck |
| Swakopmund | Walvis Bay | 2 | 6,540 | 480 | 190 | 340 | 460 | 300 | 790 | 9,100 |
| Arandis | Swakopmund | 2 | 3,010 | 210 | 80 | 320 | 450 | 280 | 730 | 5,080 |
| Karibib | Arandis | 2 | 3,320 | 220 | 90 | 320 | 460 | 280 | 740 | 5,430 |
| Okahandja | Karibib | 2 | 2,450 | 170 | 70 | 210 | 220 | 140 | 380 | 3,640 |
| Windhoek | Okahandja | 2 | 6,090 | 420 | 170 | 380 | 480 | 360 | 930 | 8,830 |
| Okahandja | Otjiwarongo | 2 | 2,480 | 160 | 70 | 170 | 250 | 190 | 480 | 3,800 |
| Gobabis | HKIA | 2 | 1,590 | 110 | 40 | 160 | 210 | 130 | 310 | 2,550 |
| HKIA | Windhoek | 2 | 3,570 | 250 | 100 | 170 | 220 | 130 | 330 | 4,770 |
| Rehoboth | Windhoek | 2 | 3,060 | 210 | 80 | 180 | 230 | 160 | 350 | 4,270 |
| Mariental | Rehoboth | 2 | 1,550 | 100 | 40 | 180 | 230 | 160 | 330 | 2,590 |
| Keetmanshoop | Mariental | 2 | 1,160 | 70 | 30 | 180 | 200 | 140 | 270 | 2,050 |
| Keetmanshoop | Luderitz | 2 | 320 | 20 | 10 | 30 | 50 | 40 | 70 | 540 |
| Karasburg | Keetmanshoop | 2 | 760 | 50 | 20 | 170 | 200 | 120 | 250 | 1,570 |
| Ariamsvlei | Karasburg | 2 | 0 | 0 | 0 | 80 | 90 | 60 | 130 | 360 |
| Karibib | Otjiwarongo | 2 | 870 | 50 | 20 | 120 | 230 | 140 | 360 | 1,790 |
| Otjiwarongo | Otavi | 2 | 2,750 | 180 | 70 | 250 | 380 | 260 | 680 | 4,570 |
| Otavi | Grootfontein | 2 | 770 | 50 | 20 | 80 | 90 | 60 | 120 | 1,190 |
| Otavi | Tsumeb | 2 | 1,980 | 130 | 50 | 170 | 290 | 200 | 560 | 3,380 |
| Tsumeb | Ondangwa | 2 | 1,520 | 90 | 40 | 130 | 200 | 170 | 430 | 2,580 |
| Ondangwa | Oshikango | 2 | 1,450 | 100 | 40 | 110 | 150 | 100 | 290 | 2,240 |
| Grootfontein | Rundu | 2 | 640 | 40 | 10 | 80 | 90 | 60 | 120 | 1,040 |
| Rundu | Katima Mulilo | 2 | 290 | 20 | 10 | 80 | 90 | 60 | 110 | 660 |

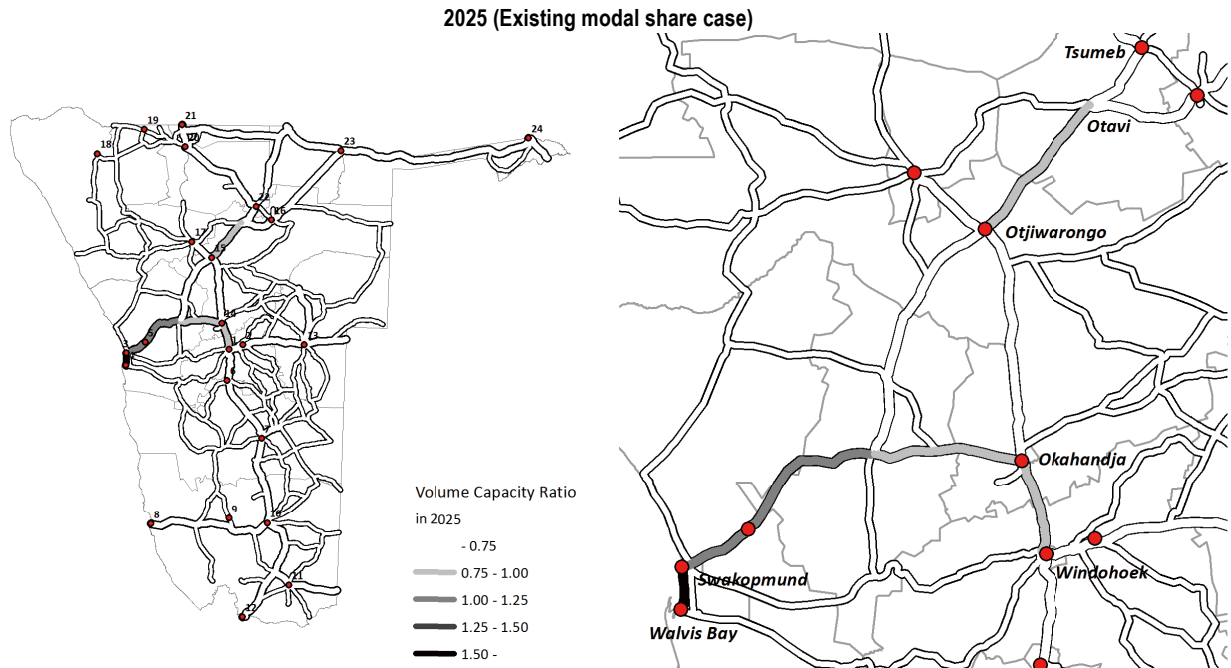
Source: Daily traffic volumes of passenger cars, medium buses, large bus and light truck are extracted from Namibia Integrated Transport Master Plan. Those of 2 axle truck, 3 axle truck and multi axle truck are forecast by JICA Study Team

Table 10.19: Traffic volume on major road sections in 2025 (existing modal share case)

| Sections | | No of lanes | Daily traffic volume (vehicle/day) | | | | | | Total (vehicle/day) | |
|--------------|---------------|-------------|------------------------------------|------------|-----------|-------------|--------------|--------------|---------------------|------------------|
| | | | Passenger car | Medium bus | Large bus | Light truck | 2 axle truck | 3 axle truck | | Multi axle truck |
| Swakopmund | Walvis Bay | 2 | 13,780 | 1,000 | 390 | 650 | 900 | 520 | 1,510 | 18,750 |
| Arandis | Swakopmund | 2 | 6,020 | 410 | 160 | 600 | 840 | 470 | 1,350 | 9,850 |
| Karibib | Arandis | 2 | 6,600 | 440 | 170 | 600 | 840 | 470 | 1,350 | 10,470 |
| Okahandja | Karibib | 2 | 5,050 | 360 | 130 | 350 | 420 | 250 | 740 | 7,300 |
| Windhoek | Okahandja | 4 | 11,360 | 790 | 300 | 670 | 880 | 580 | 1,680 | 16,260 |
| Okahandja | Otjiwarongo | 2 | 4,240 | 280 | 110 | 330 | 450 | 300 | 860 | 6,570 |
| Gobabis | HKIA | 2 | 2,770 | 190 | 70 | 240 | 380 | 190 | 590 | 4,430 |
| HKIA | Windhoek | 4 | 6,940 | 480 | 180 | 240 | 390 | 200 | 620 | 9,050 |
| Rehoboth | Windhoek | 4 | 5,770 | 390 | 150 | 340 | 410 | 250 | 650 | 7,960 |
| Mariental | Rehoboth | 2 | 2,850 | 180 | 60 | 340 | 410 | 240 | 640 | 4,720 |
| Keetmanshoop | Mariental | 2 | 2,100 | 130 | 40 | 340 | 380 | 220 | 560 | 3,770 |
| Keetmanshoop | Luderitz | 2 | 490 | 30 | 10 | 20 | 50 | 30 | 60 | 690 |
| Karasburg | Keetmanshoop | 2 | 1,410 | 90 | 30 | 340 | 370 | 210 | 520 | 2,970 |
| Ariamsvlei | Karasburg | 2 | 0 | 0 | 0 | 150 | 200 | 120 | 310 | 780 |
| Karibib | Otjiwarongo | 2 | 1,550 | 80 | 40 | 260 | 430 | 220 | 620 | 3,200 |
| Otjiwarongo | Otavi | 2 | 4,630 | 280 | 110 | 540 | 770 | 450 | 1,300 | 8,080 |
| Otavi | Grootfontein | 2 | 1,280 | 70 | 30 | 250 | 250 | 130 | 320 | 2,330 |
| Otavi | Tsumeb | 2 | 3,350 | 210 | 80 | 290 | 520 | 320 | 980 | 5,750 |
| Tsumeb | Ondangwa | 2 | 2,410 | 140 | 60 | 240 | 420 | 280 | 830 | 4,380 |
| Ondangwa | Oshikango | 2 | 1,930 | 130 | 50 | 210 | 360 | 200 | 660 | 3,540 |
| Grootfontein | Rundu | 2 | 1,020 | 60 | 20 | 250 | 240 | 130 | 320 | 2,040 |
| Rundu | Katima Mulilo | 2 | 470 | 20 | 10 | 260 | 240 | 130 | 310 | 1,440 |

Source: Daily traffic volumes of passenger cars, medium buses, large bus and light truck are extracted from Namibia Integrated Transport Master Plan. Those of 2 axle truck, 3 axle truck and multi axle truck are forecast by JICA Study Team





Source: JICA Study Team

Figure 10.17: Future traffic condition (existing modal share case)

10.3.3 Rail oriented case

10.3.3.1 Cargo transport by rail

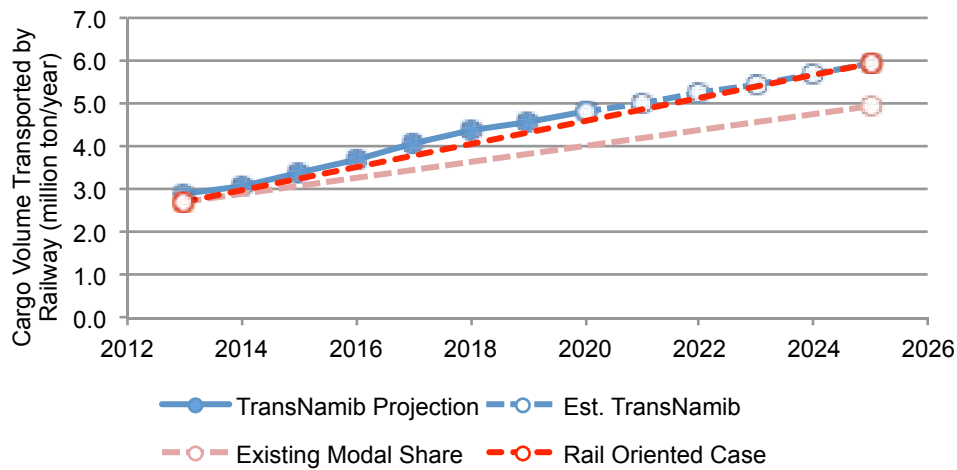
As a railway oriented demand forecast case, the future railway cargo demand for 2025 is assumed to be 6.0 million tons based on an average growth rate in 2018-2020 projected by TransNamib. In this case, cargo transport share of railway will increase to 14.7%.

Table 10.20: Future total cargo volume relevant to Namibia (rail oriented case)

Unit: million ton per year

| Modes | 2013 | | 2025 f | |
|---------|------|----------|--------|----------|
| Railway | 2.7 | (12.2%) | 6.0 | (14.7%) |
| Road | 19.6 | (87.9%) | 34.5 | (85.3%) |
| Total | 22.2 | (100.0%) | 40.5 | (100.0%) |

Source: JICA Study Team

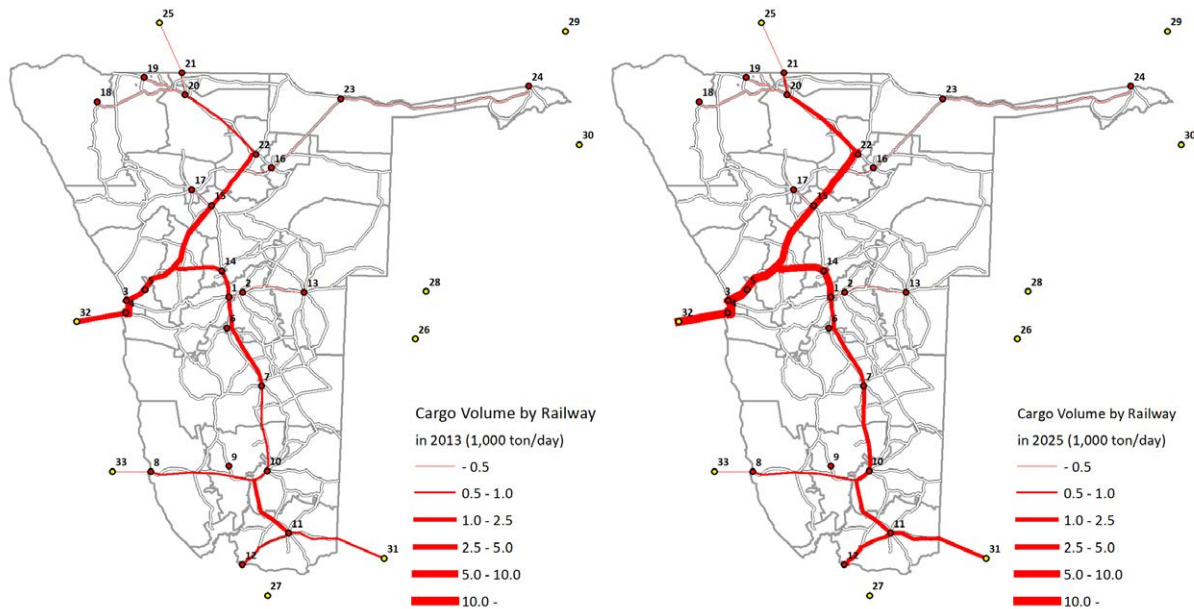


Source: JICA Study Team

Figure 10.18: Cargo transport in 2025 based on TransNamib projection

An increased cargo volume is distributed to OD pairs between (i) Walvis Bay – Kranzberg and Kranzberg – Oshikango, and (ii) Walvis Bay – Kranzberg and Kranzberg – Windhoek considering TransNamib business plan.

As a result of assignment on railway network, section volume of cargo at Walvis Bay – Swakopmund will increase to 13,080 ton per day from 10,220 ton per day in the existing modal share case.



Note: The figures include road transport to access railway station.
Source: JICA Study Team

Figure 10.19: Rail cargo transport in 2013 and 2025 (rail oriented case)

Table 10.21: Forecast cargo demand for rail at major sections

Unit: ton per day

| Section | | Length (km) | 2013 | 2025 f (existing modal share case) | 2025 f (rail oriented case) |
|--------------|--------------|-------------|-------|------------------------------------|-----------------------------|
| Swakopmund | Walvis Bay | 50.3 | 5,230 | 10,220 | 13,080 |
| Kranzberg | Swakopmund | 161.5 | 4,700 | 8,650 | 11,510 |
| Okahandja | Kranzberg | 139.9 | 2,170 | 4,960 | 5,280 |
| Windhoek | Okahandja | 72.7 | 2,190 | 4,980 | 5,300 |
| Gobabis | Windhoek | 226.1 | 50 | 90 | 90 |
| Rehoboth | Windhoek | 94.2 | 1,110 | 1,780 | 1,780 |
| Mariental | Rehoboth | 177.2 | 1,110 | 1,770 | 1,770 |
| Keetmanshoop | Mariental | 231.5 | 950 | 1,550 | 1,550 |
| Keetmanshoop | Lüderitz | 865.6 | 710 | 940 | 940 |
| Karasburg | Keetmanshoop | 227.3 | 1,120 | 1,370 | 1,370 |
| Ariamsvlei | Karasburg | 135.6 | 840 | 1,290 | 1,290 |
| Kranzberg | Otavi | 327.6 | 2,530 | 3,690 | 6,240 |
| Otavi | Grootfontein | 94.8 | 100 | 140 | 230 |
| Otavi | Tsumeb | 61.3 | 2,000 | 3,060 | 5,150 |
| Tsumeb | Ondangwa | 247.3 | 560 | 880 | 1,310 |
| Ondangwa | Oshikango | 56.7 | 340 | 570 | 920 |

Note: Total of both directions of assignment results of base case with existing modal share. Cargo volume in 2013 is actual average daily transport in 2013 based on TransNamib data.

Source: JICA Study Team

10.3.3.2 Cargo transport by road

In accordance with the increase of the share of cargo transport by railway, the cargo volume transported by road is reduced and road congestion is alleviated. Figure 10.20 shows cargo transport by road in 2013 and 2025 (rail oriented case), and Figure 10.21 shows vehicle volume in 2013 and 2025 (rail oriented case), respectively. As a result of modal shift from road transport to rail transport, traffic volume at the section of Walvis Bay – Swakopmund dropped from 18,750 to 1,8570. Traffic volume of Swakopmund – Arandis also dropped from 9,850 to 9,650 as indicated in Table 10.22.

The future daily traffic volumes Karibib – Arandis are higher than Arandis – Swakopmund as indicated in Table 10.22 (traffic volume of rail oriented case in 2025) as same as the traffic volume in 2013 (Table 10.18) and that in 2025 (existing modal share case, Table 10.19). Figure 10.22 also shows Swakopmund – Arandis has a lower Volume Capacity Ratio than Arandis – Karibib.

It is necessary to re-examine traffic demand forecast prepared by Integrated Transport Master Plan carefully, and to forecast traffic volume again by use of available traffic data when road development projects are proposed in the future.

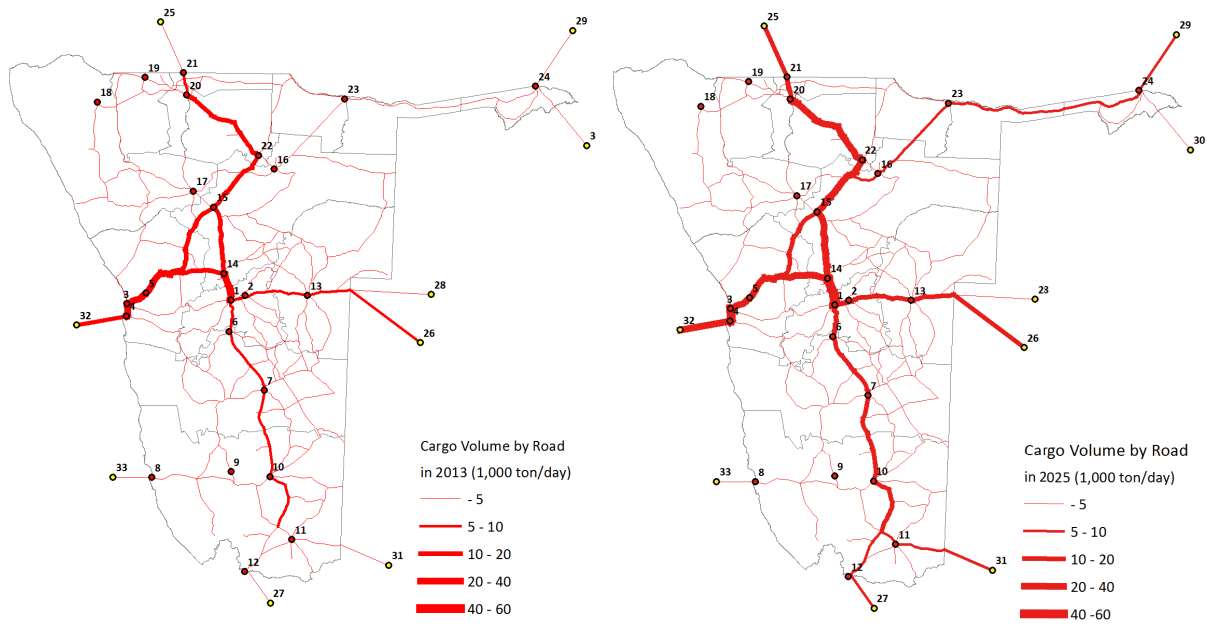


Figure 10.20: Cargo transport by road in 2013 and 2025 (rail oriented case)

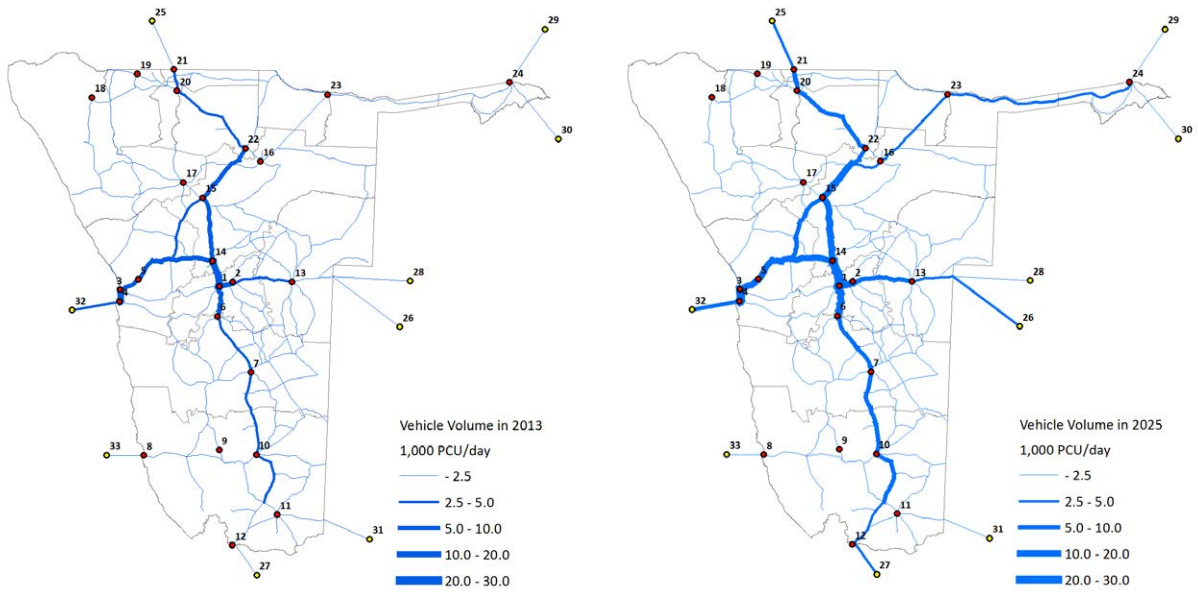
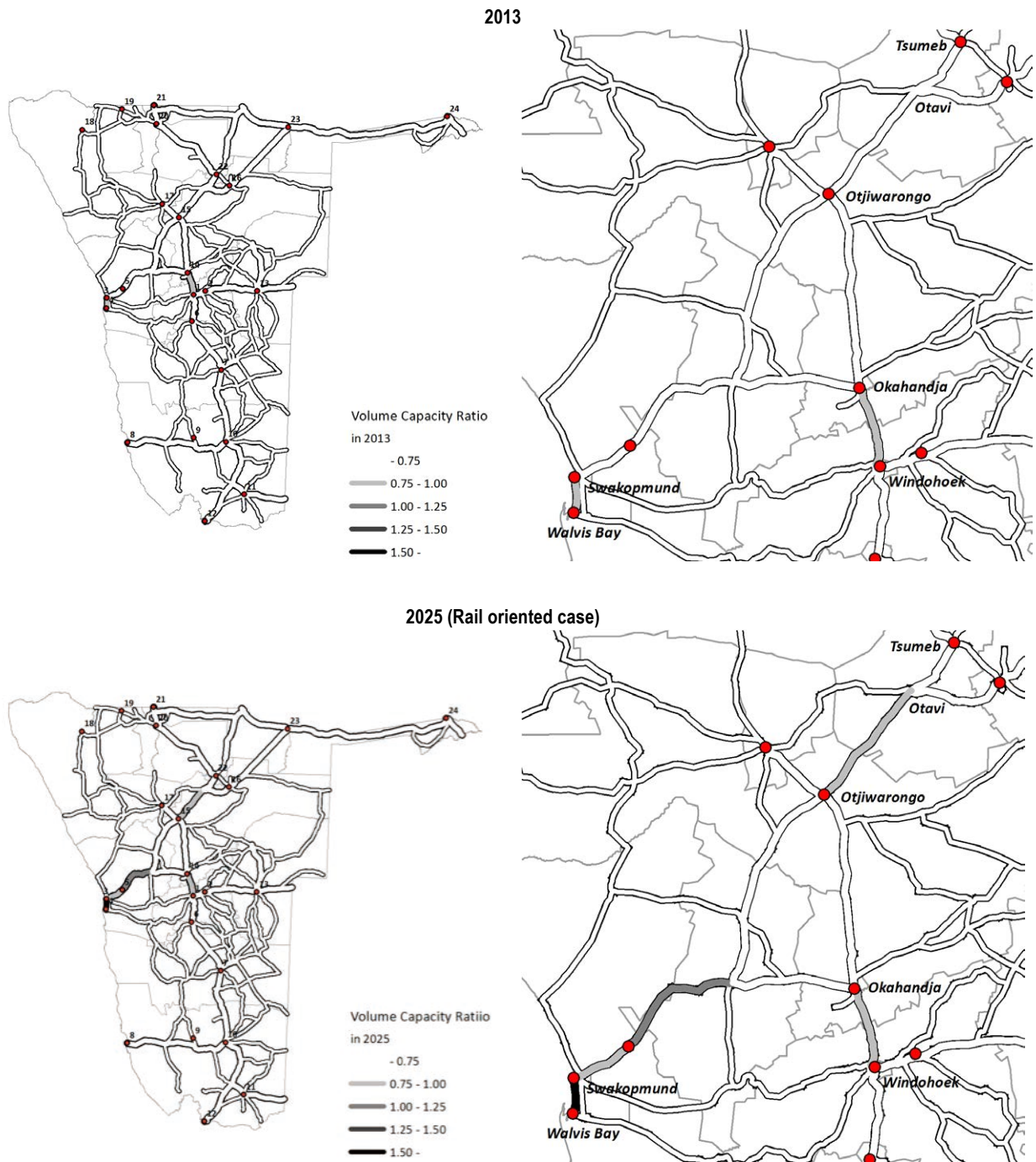


Figure 10.21: Vehicle volume in 2013 and 2025 (rail oriented case)

Source: JICA Study Team



Source: JICA Study Team

Figure 10.22: Future traffic situation (rail oriented case)

Table 10.22: Traffic volume on major road sections in 2025 (rail oriented case)

| Sections | | No of lanes | Daily traffic volume (vehicle/day) | | | | | | Total (vehicle/day) | |
|--------------|---------------|-------------|------------------------------------|------------|-----------|-------------|--------------|--------------|---------------------|------------------|
| | | | Passenger car | Medium bus | Large bus | Light truck | 2 axle truck | 3 axle truck | | Multi axle truck |
| Swakopmund | Walvis Bay | 2 | 13,780 | 1,000 | 390 | 630 | 850 | 500 | 1,420 | 18,570 |
| Arandis | Swakopmund | 2 | 6,020 | 410 | 160 | 580 | 780 | 440 | 1,260 | 9,650 |
| Karibib | Arandis | 2 | 6,600 | 440 | 170 | 590 | 790 | 440 | 1,260 | 10,290 |
| Okahandja | Karibib | 2 | 5,050 | 360 | 130 | 350 | 410 | 250 | 730 | 7,280 |
| Windhoek | Okahandja | 4 | 11,360 | 790 | 300 | 670 | 870 | 580 | 1,670 | 16,240 |
| Okahandja | Otjiwarongo | 2 | 4,240 | 280 | 110 | 330 | 450 | 300 | 860 | 6,570 |
| Gobabis | HKIA | 2 | 2,770 | 190 | 70 | 240 | 380 | 190 | 590 | 4,430 |
| HKIA | Windhoek | 4 | 6,940 | 480 | 180 | 240 | 390 | 200 | 620 | 9,050 |
| Rehoboth | Windhoek | 4 | 5,770 | 390 | 150 | 340 | 410 | 250 | 650 | 7,960 |
| Mariental | Rehoboth | 2 | 2,850 | 180 | 60 | 340 | 410 | 240 | 640 | 4,720 |
| Keetmanshoop | Mariental | 2 | 2,100 | 130 | 40 | 340 | 380 | 220 | 560 | 3,770 |
| Keetmanshoop | Luderitz | 2 | 490 | 30 | 10 | 20 | 50 | 30 | 60 | 690 |
| Karasburg | Keetmanshoop | 2 | 1,410 | 90 | 30 | 340 | 370 | 210 | 520 | 2,970 |
| Ariamsvlei | Karasburg | 2 | 0 | 0 | 0 | 150 | 200 | 120 | 310 | 780 |
| Karibib | Otjiwarongo | 2 | 1,550 | 80 | 40 | 240 | 370 | 190 | 540 | 3,010 |
| Otjiwarongo | Otavi | 2 | 4,630 | 280 | 110 | 530 | 720 | 430 | 1,230 | 7,930 |
| Otavi | Grootfontein | 2 | 1,280 | 70 | 30 | 250 | 250 | 130 | 320 | 2,330 |
| Otavi | Tsumeb | 2 | 3,350 | 210 | 80 | 270 | 480 | 300 | 910 | 5,600 |
| Tsumeb | Ondangwa | 2 | 2,410 | 140 | 60 | 240 | 410 | 280 | 810 | 4,350 |
| Ondangwa | Oshikango | 2 | 1,930 | 130 | 50 | 210 | 350 | 190 | 650 | 3,510 |
| Grootfontein | Rundu | 2 | 1,020 | 60 | 20 | 250 | 240 | 130 | 320 | 2,040 |
| Rundu | Katima Mulilo | 2 | 470 | 20 | 10 | 260 | 240 | 130 | 310 | 1,440 |

Source: Daily traffic volumes of passenger cars, medium buses, large bus and light truck are extracted from Namibia Integrated Transport Master Plan. Those of 2 axle truck, 3 axle truck and multi axle truck are forecast by JICA Study Team

11. Market Promotion

11.1 Questionnaire survey

11.1.1 Overview of questionnaire survey

A questionnaire survey and an interview survey of private companies in Zambia were carried out as part of this Study as examples of marketing activities. The following steps were taken in executing these surveys.

Firstly, the team visited the Zambia Association of Manufacturers (hereinafter referred to as “ZAM”), and obtained the contact details of ZAM members. The Study Team conducted a questionnaire survey and an interview survey with the cooperation of ZAM and the WBCG Zambia Office, in order to explore companies who can possibly use the Namibia route.

The questionnaire was sent to 163 companies to obtain information on (i) kind of goods handled, (ii) logistics route and (iii) possibility to use the Namibia route. The study team received replies from 26 companies (16.0%). Effective responses were from 18 companies. Table 11.1 gives an overview of the questionnaire survey, and Table 11.2 gives the responses of the target companies, respectively.

Table 11.1: Overview of questionnaire survey

| Target, group, survey method and date of survey | | Remarks |
|---|--|---|
| Target group | Manufacturers in Zambia | Joint Survey with ZAM (Zambia Association of Manufacturers) |
| Survey method | Email | Cover letter, questionnaire (PDF and Microsoft Word format) |
| | Follow-up call | All companies. Once or twice |
| Date | 18 th – 26 th of September | Follow-up call: 22 nd of September to 14 th of November |

Source: JICA Study Team

Table 11.2: Collection of the questionnaire

| No of questionnaires to be delivered and collected | Remarks | |
|--|---------|--|
| Delivered to be sent | 235 | All ZAM member companies |
| Undelivered | 72 | Writing errors in email address and telephone number, etc. |
| Number of samples | 163 | |
| Respondents | 26 | |
| International market | 19 | Agro-processing, metal, leather & textile and pharmaceutical, etc. |
| Local market | 7 | |
| Response rate | 16.0% | |
| Effective respondents | 18 | |

Source: JICA Study Team

According to the replies, all companies are importers and 11 companies (61.1%) are exporters.

Most origins of imports are from Asia (in particular India) and Africa. The number of companies importing from Europe and America is relatively small. Many companies are using Dar es Salaam

Port (8 companies) and Beira Port (7 companies), and some companies are using Walvis Bay Port (4 companies). Regarding inland transportation, half of the respondents are using container trailers, while the others use flat bed trucks. Only one company uses rail.

Table 11.3: Compilation of logistics in the questionnaire survey

| Questions | Import | Numbe of replies | Export | number of replies |
|--|----------------|------------------|----------------|-------------------|
| Situation of trade | Import Company | 16 | Export Company | 10 |
| Origin/destination | India | 8 | India | 0 |
| | Africa | 8 | Africa | 10 |
| | Asia | 6 | China | 1 |
| | Europe | 3 | Europe | 1 |
| | America | 1 | America | 0 |
| Current using port | Dar es Salaam | 8 | Dar es Salaam | 2 |
| | Beira | 7 | Beira | 2 |
| | Durban | 5 | Durban | 1 |
| | Walvis Bay | 4 | Walvis Bay | 1 |
| Decision maker of company's route | Your company | 5 | Your company | 3 |
| | Parent company | 5 | Parent company | 2 |
| | other | 4 | other | 1 |
| Style of cargo export: shipping from factory Import: arriving at port | Container | 8 | Container | 4 |
| | Other | 6 | Other | 4 |
| Inland transport | Container | 8 | Container | 4 |
| | Flat Bed | 7 | Flat Bed | 5 |
| | Rail | 1 | Rail | 1 |

Source: JICA Study Team













Almost all export destinations are to Africa, and only a few companies export to Asia and Europe. Since most cargo is exported to countries within Africa, only a few companies use ports such as Dar es Salaam Port (2 companies), Beira Port (2 companies), Durban Port (1 company) and Walvis Bay Port (1 company). Regarding inland transportation, half of the respondents are using container trailers while the other half use flat bed trucks. Only one company uses rail transport. Table 11.3 shows the logistics situation.

The questionnaire had a question about reasons for selecting the current port. Many companies answered as follows; (1) short transit time, (2) existence of reliable logistics company and (3) cheap transportation cost. Regarding possibility of changing ports, 6 companies replied that they could change ports if conditions of the new port could fulfil their requirement. The study team found that many companies are interested in Walvis Bay Port and Beira Port as potential ports in the future. The study team asked companies that replied they are interested in Walvis Bay about the trade particulars. Most of the companies are trading with Europe and America, and one company has a

factory in Livingstone (close to Namibia). The study team could confirm that potential customers of Walvis Bay are companies trading with Europe and America and a company that has a business operation near Namibia. They can benefit financially by transporting cargo faster with a lower total costs through Walvis Bay.

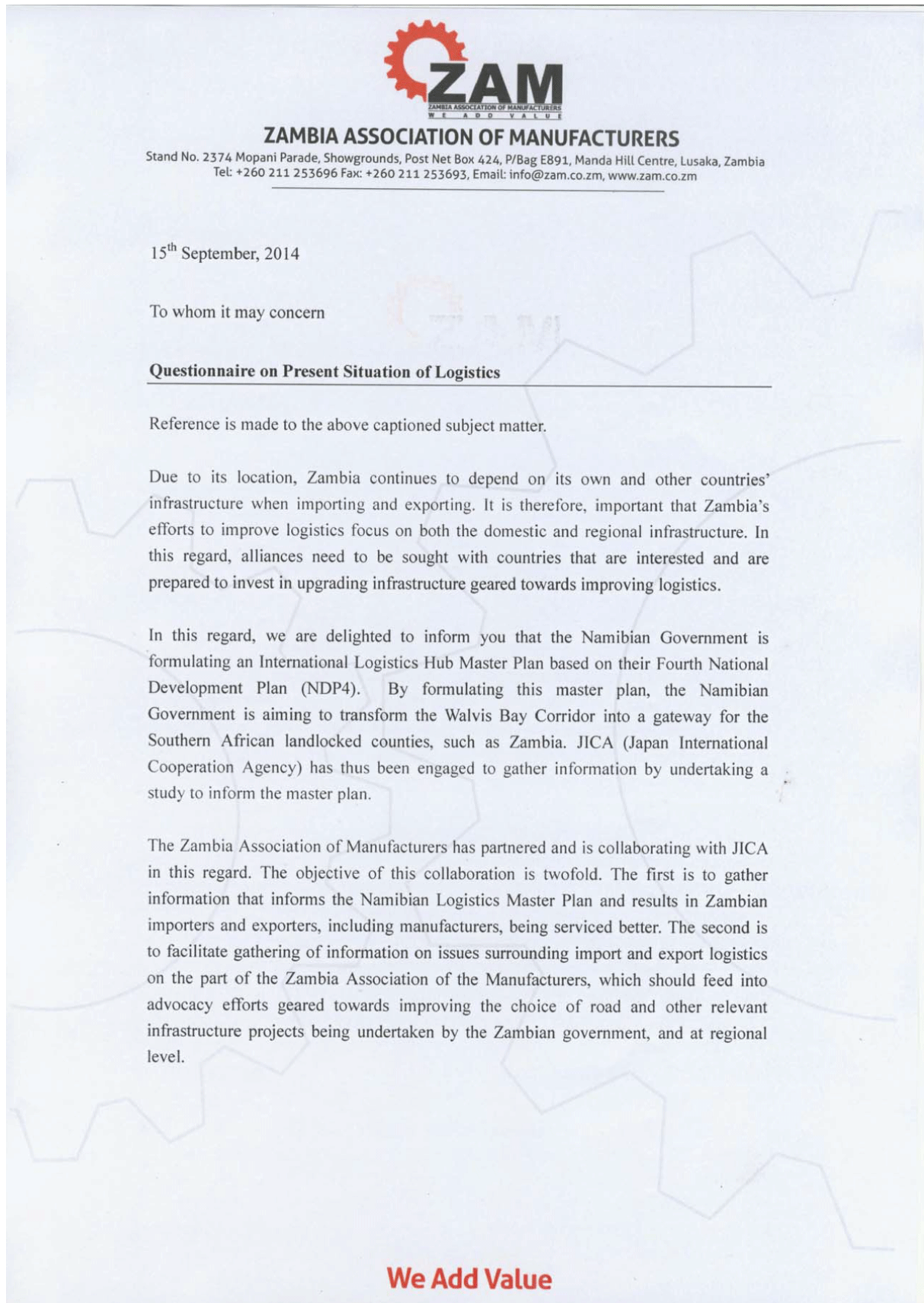
Table 11.4 indicates Criteria for choosing a port and candidate ports.

Table 11.4: Criteria for choosing a port and alternative ports

| Questions | Import | Number of replies | | |
|---|---|--|--|---|
| Main reason to select the current port | Short transit time |  | | 8 |
| | Reliability of logistics company |  | | 6 |
| | Cheap transport cost |  | | 5 |
| | Speed of custom clearance |  | | 3 |
| | Direction of parents company |  | | 3 |
| | Other |  | | 4 |
| Future possibility to change the present port | Continue to use the present port |  | | 6 |
| | Possibly change the port |  | | 6 |
| If you change the present port, which port are you interested in? | Walvis Bay |  | | 4 |
| | Beira |  | | 2 |
| | Durban |  | | 1 |
| | Dar es Salaam |  | | 1 |
| Issues about the present port | Durban: long transit time, Dar es Salaam: unreliable, poor service, congestion, long to discharge, long transit time | | | |
| Advantages and Disadvantages of Walvis Bay | Not transit through 3rd country, Quick Efficient, Cheap Expensive | | | |

Source: JICA Study Team

11.1.2 Questionnaire sheet



Questionnaire on Present Situation of Logistics

Kindly return the completed questionnaire to the study team by email by 26th of September 2014. If you have any questions and comments on this survey, please contact to Eiji Nishizaki by e-mail (nishizaki@sio.ne.jp) or phone (+246-81-427-4867) and copy it to info@zam.co.zm or g.tembo@zam.co.zm

● How to Answer

(1) In case of Blank Answer Column, please write answer directly. Following is an example.

| | name of goods | Destination | | Volume(TEU or Ton) | |
|-----|---------------|-------------|--------------|--------------------|----------|
| | | Country | City or Port | TEU/year | Ton/year |
| 1st | copper wire | USA | NY/NJ | 150TEU | 1500tons |

(2) In case of choice question, Please write number of answer. Following is an example.

| Question | Answer | choices | | |
|---|--------|---------------------------------|---------------------------------|------------------------------------|
| Style of Cargo at the time of shipment from factory | 2 | (1) 40f Container (4) Pallet | (2) 20f Container (5) Carton | (3) Reefer Container (6) Other: |

● How to Return

(1) **E-mail** : Please **“Reply to all”**. [address] nishizaki@sio.ne.jp and g.tembo@zam.co.zm

(MS-word) Please send MS-word file.

(Hand-writing) Please scan/photo and then mail.



Please send MS-word file

or



Scan Photo



Please send PDF/JPEGfile

(2) **Fax** : [\(+260\) 21 124 1329](tel:+260211241329) (WALVIS BAY CORRIDOR GROUP Zambia Office)

Q1 Your company

Q1-1 Please fill company name, address, contact person and contact address.

| | | |
|-----------------|------------|--|
| Company | Name | |
| | Address | |
| Contact person | Name | |
| | Department | |
| | Job Title | |
| Contact address | Telephone | |
| | E-mail | |

Q1-2 Please fill major handling goods of your company.

| | | |
|-------------|----|--|
| Major Goods | 1. | |
| | 2. | |
| | 3. | |

Q2 Export of Goods

Q2-1 Please fill major destination and volume of your export goods.

| | name of goods | Destination | | Volume(TEU or Ton) | |
|-----|---------------|-------------|--------------|--------------------|----------|
| | | Country | City or Port | TEU/year | Ton/year |
| 1st | | | | | |
| 2nd | | | | | |
| 3rd | | | | | |

Q2-2 Please select your logistics route, warehouse and Decision Maker.

| Question | Answer | Choices |
|--|--------|--|
| Route from your factory to Port | | (1) type1: transport from your factory to port directly (2) type2: transport from your factory to port via warehouse |
| In the case of type2, Whose warehouse do you go through? | | (1) your warehouse / parents company's warehouse (2) Trading company / logistics company warehouse (3) Other : |
| Main Decision Maker of your export route | | (1) Parent company (2) Your company (3) Trading company (name of the company : _____) (4) Logistics company (name of the company: _____) (5) Consignee (name of the company : _____) (6) Other: |

Type1: Transport to port directly



Type2: Transport to port via warehouse

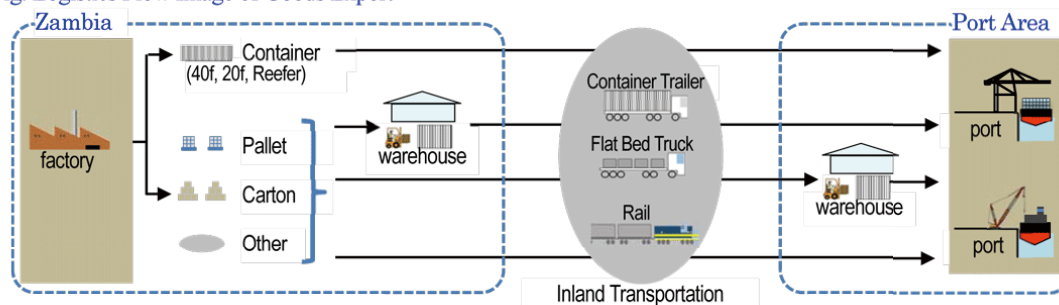


Q2-3 Please select export port, style of cargo, loading place, inland transportation and so on.

(multiple selections are allowed)

| Question | Answer | choices |
|--|--------|---|
| Main Export Port *please approximate share | | (1) Durban(%) (2) Walvis Bay(%) (3) Dar es Salaam(%) (4) Beira(%) (5) Maputo(%) (6) Other: (%) |
| -Main Ship | | (1) Container Ship (2) General Cargo Ships (3) RORO (4) Other |
| Main Route(BorderPost) | | (1) Chirundu (2)Nakonde (3)Victoria Falls (4)Kazungula (5)Wenella (6) Other: |
| Main style of cargo at the time of shipment from factory | | (1) 40f Container (2) 20f Container (3) Reefer Container (4) Pallet (5) Carton (6) Other: |
| Place of loading into container | | (1) Your factory (2) Warehouse near your factory (3) Warehouse near Port (4) Other: |
| Main Inland Transportation Method from factory to port | | (1) Container Trailer (2) Flat Bed Truck (3) Rail (4) Other: _____ |
| Frequency of Shipment | | (1) one or more times per day (2) about once a week (3) about once a month (4) Other: _____ |

Fig. Logistics Flow Image of Goods Export



Q3 Import of Materials

Q3-1 Please fill major origin and volume of your import goods.

| | name of goods | Origin | | Volume(TEU or Ton) | |
|-----|---------------|---------|--------------|--------------------|----------|
| | | Country | City or Port | TEU/year | Ton/year |
| 1st | | | | | |
| 2nd | | | | | |
| 3rd | | | | | |

Q3-2 Please select your logistics route, warehouse and Decision Maker.

| Question | Answer | Choices |
|--|--------|--|
| Route from port to factory | | (1) type1: transported from port to your factory directly (2) type2: transported from port to your factory via warehouse |
| In the case of type2, Whose warehouse do you go through? | | (1) your warehouse / parents company's warehouse (2) Trading company / logistics company warehouse (3) Other : |
| Main Decision Maker of your import route | | (1) Parent company (2) Your company (3) Trading company (name of the company : _____) (4) Logistics company (name of the company: _____) (5) Consignee (name of the company : _____) (6) Other: |

Type1: Transported to factory directly



Type2: Transported to factory via warehouse

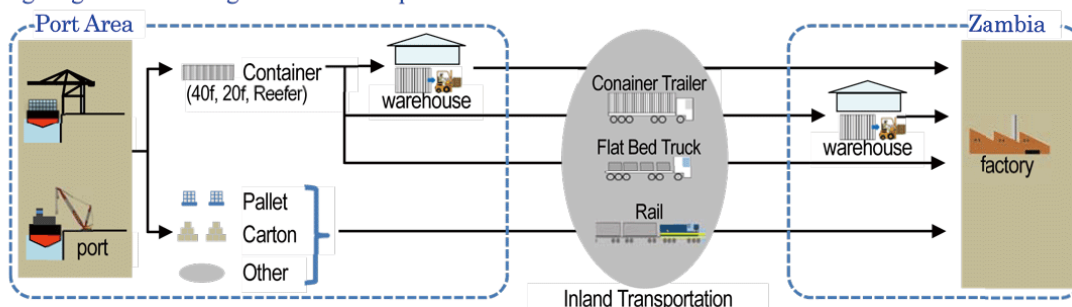


Q3-3 Please select import port, style of cargo, discharging place, inland transportation and so on.

(multiple selections are allowed)

| Question | Answer | choices |
|--|--------|--|
| Main Import Port *please approximate share | | (1) Durban(%) (2) Walvis Bay(%) (3) Dar es Salaam(%) (4) Beira(%) (5) Maputo(%) (6) Other: (%) |
| -Main Ship | | (1) Container Ship (2) General cargo ships (3) RORO (4) Other |
| Main Route(BorderPost) | | (1) Chirundu (2) Nakonde (3) Victoria Falls (4) Kazungula (5) Wenella (6) Other: |
| Main style of cargo at the time of arrival to port | | (1) 40f Container (2) 20f Container (3) Reefer Container (4) Pallet (5) Carton (6) Other: |
| Place of discharging from container | | (1) Warehouse near Port (2) Warehouse near your factory (3) Your factory (4) Other: |
| Main Inland Transportation Method from port to factory | | (1) Container Trailer (2) Flat Bed Truck (3) Rail (4) Other: |
| Frequency of Arrival | | (1) one or more times per day (2) about once a week (3) about once a month (4) Other: |

Fig. Logistics Flow Image of Materials Import



Q4 Reason to select your present port and Future possibility to use other port

Q4-1 Please check the reasons to use your present port. (Please select the major 3 reasons)

| | Answer | choices |
|----------------------------------|--------|---|
| Main reason when you choose port | | (1) Short transit time (2) Cheap transport cost (3) Frequent shipping service (4) Reliability of logistics company (5) Many logistics facilities (6) Many logistics services (7) Speed of custom clearance (8) Direction of your parents company (9) Direction of consignee or trader (10) There are your own logistics facilities. (11) Other: _____ |

Q4-2 Please reply future possibility to change the present port and the condition.

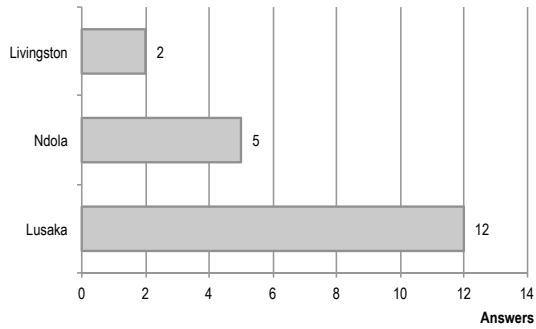
| | Answer | choices |
|--|--|--|
| Future possibility to change the present port | | (1) We continue to use the present port (2) We can possibly change the port if it meets conditions. |
| If you change the present port, which port are you interested in? | | (1) Durban (2) Walvis Bay (3) Dar es Salaam (4) Beira (5) Maputo (6) Other: _____ |
| Please tell us issues about the present port if any. | (Examples: ship congestion, long transit time, long distance to your market, etc.) | |
| If you use WALVIS BAY PORT, please write the advantages and disadvantages. | | |

Thank you for your co-operation in completing this questionnaire. Kindly return the questionnaire as specified in the email address in the 1st page.

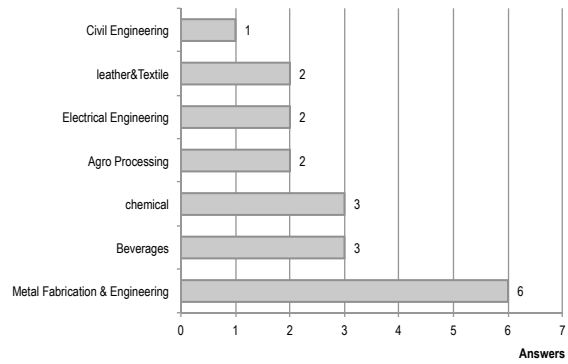
11.1.3 Results of questionnaire survey

11.1.3.1 Q1: company profile

Locations

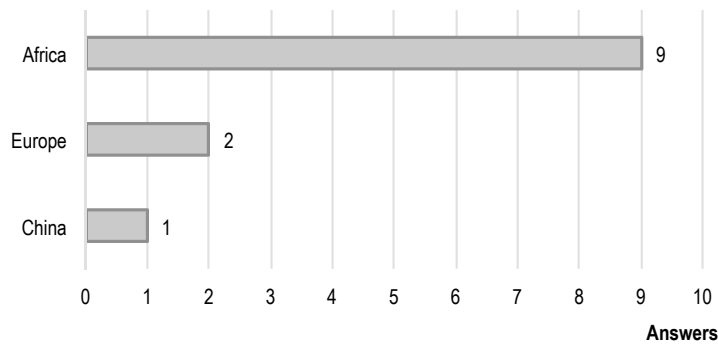


Kind of businesses



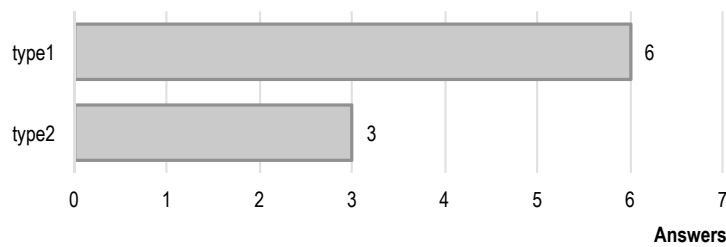
11.1.3.2 Q2: Export

Q2-1: Major destination

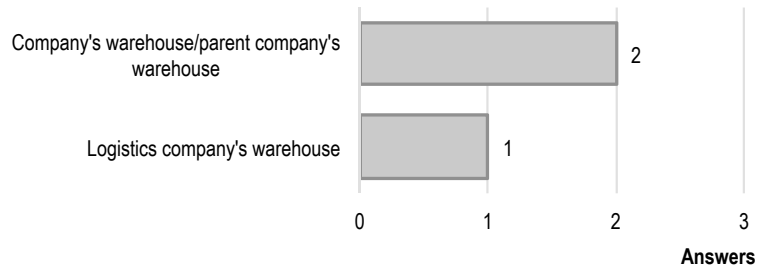


Q2-2: Logistics route and decision maker

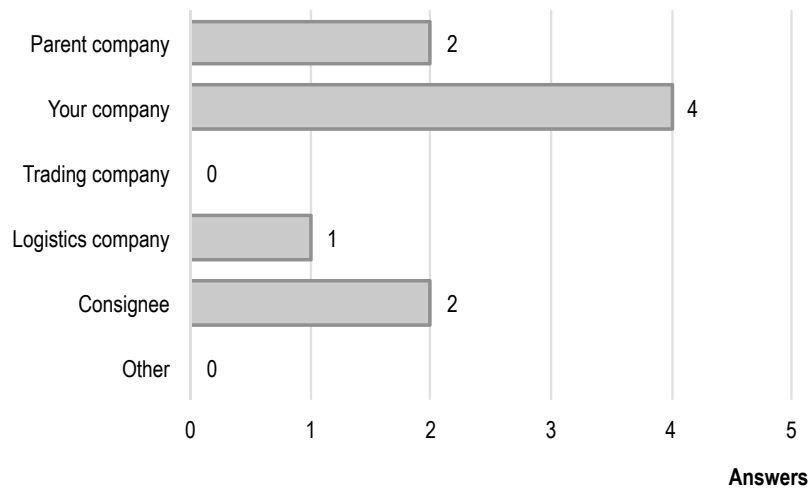
Route from your factory to port: type 1 (factory to port) or type 2 (factory to warehouse)



In the case of type 2, whose warehouse does your cargo through?

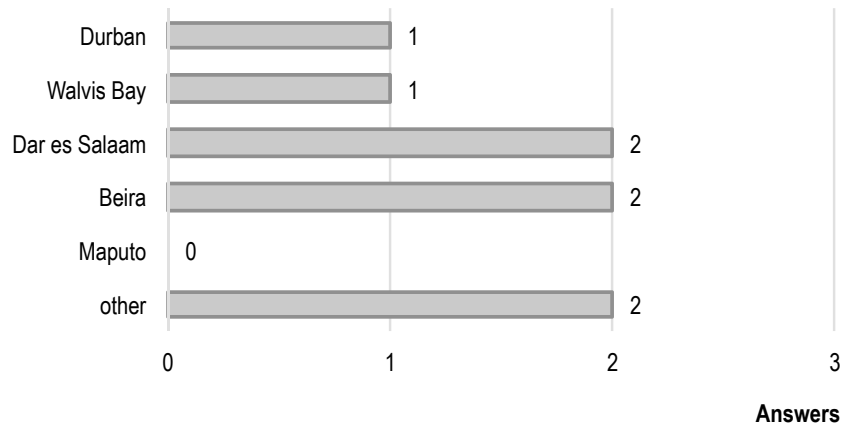


Main decision maker of your export route

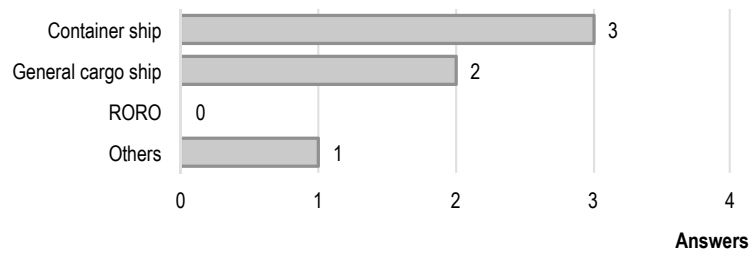


Q2-3: Selection of export port, style of cargo, loading place, inland transportation, etc.

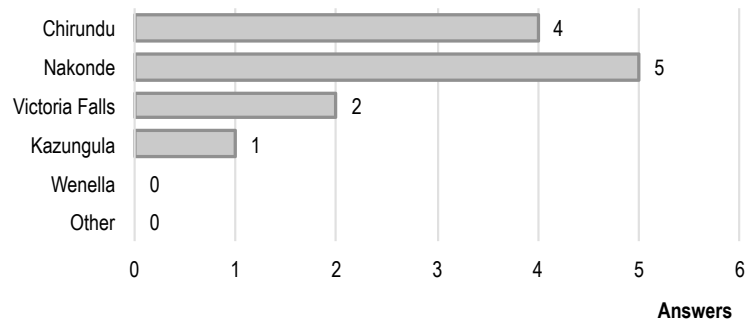
Main export port



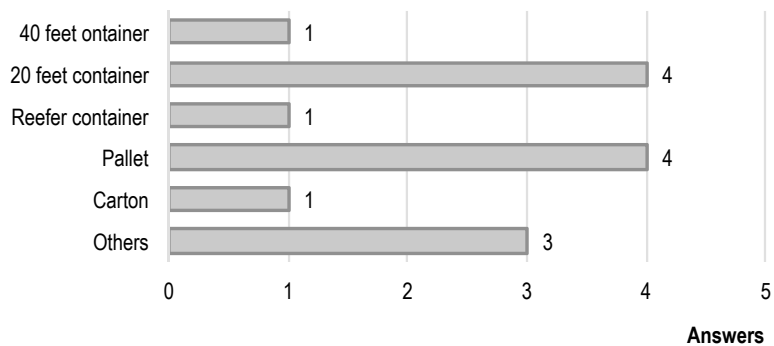
Kind of ship



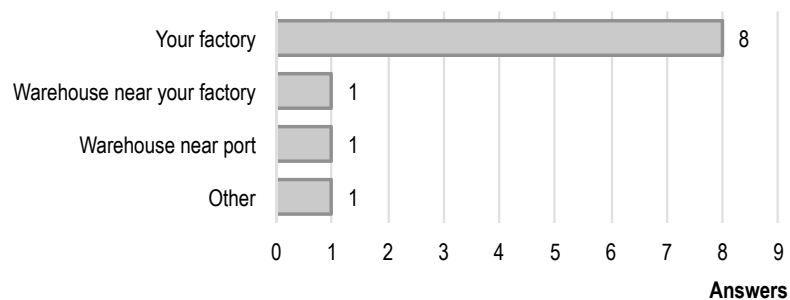
Main route (border post)



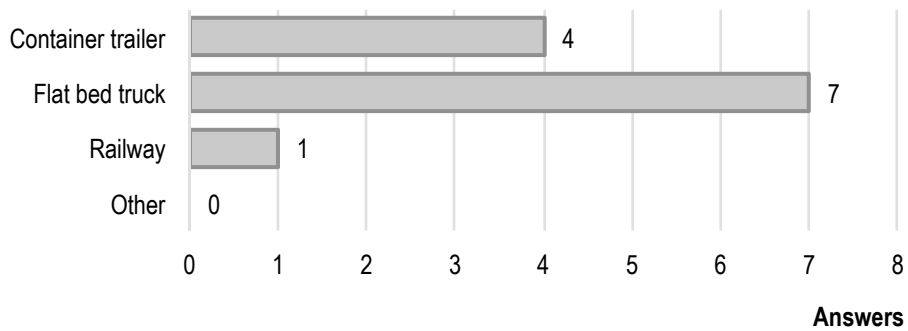
Major style of cargo at the time of shipment from factory



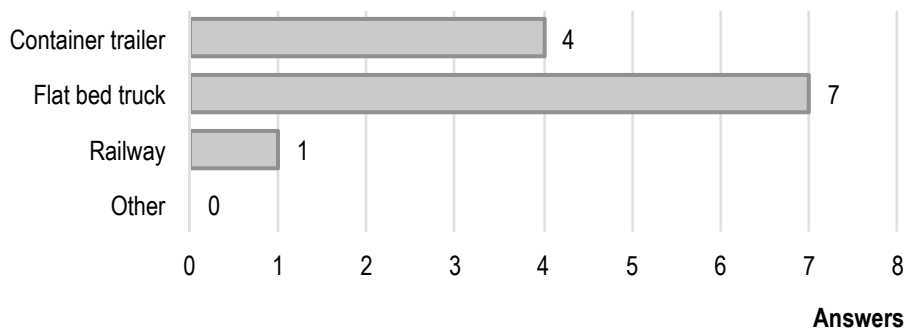
Place of loading into container



Main Inland Transportation Method from factory to port

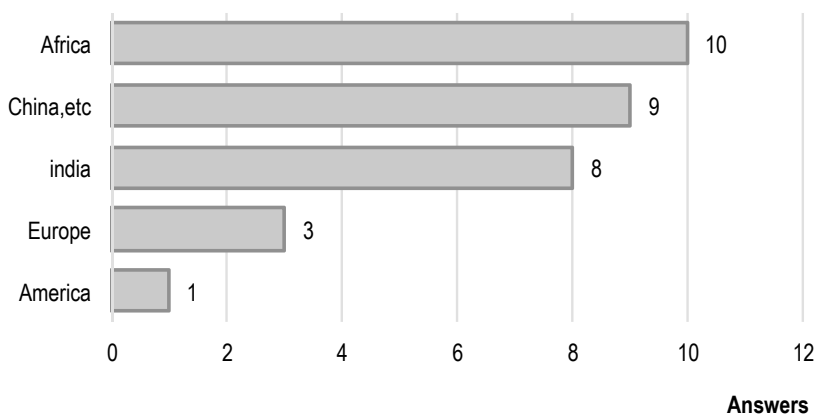


Frequency of shipment



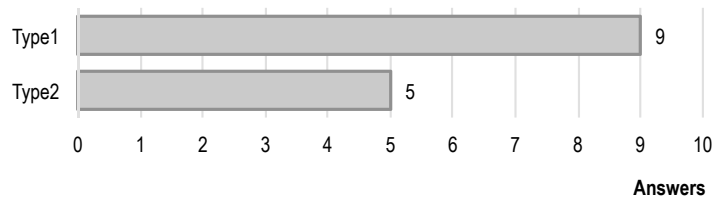
11.1.3.3 Q3 Import

Q3-1 Import origin

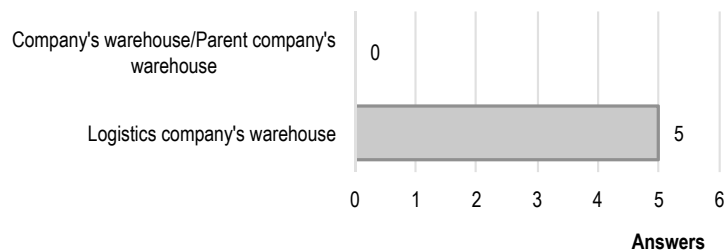


Q3-2: Logistics route and decision maker

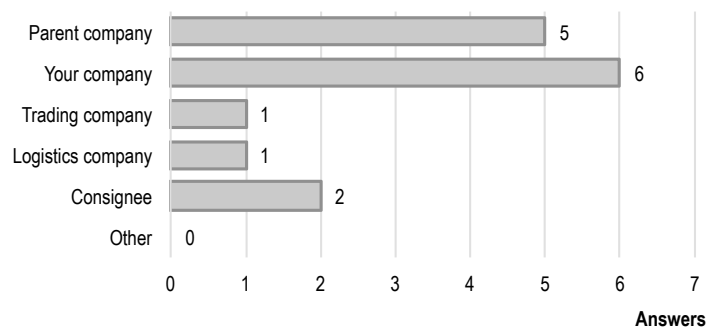
Route from your factory to port: type 1 (factory to port) or type 2 (factory to warehouse)



In the case of type2, whose warehouse does your cargo go through?

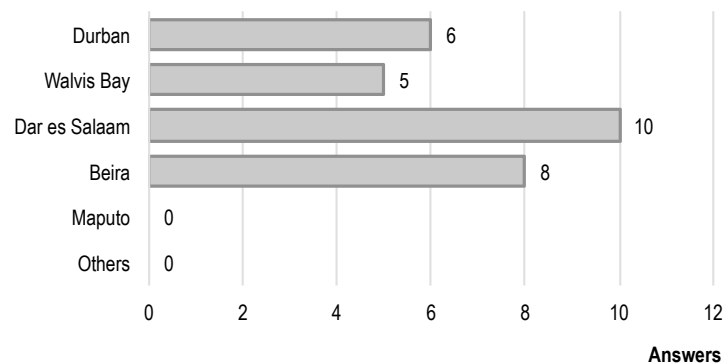


Main decision maker of your import route

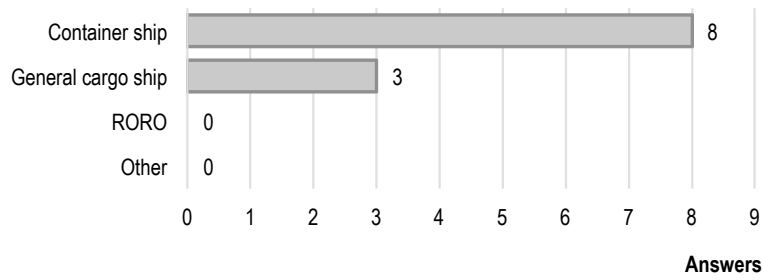


Q3-3: Selection of import port, style of cargo, discharging place, inland transportation, etc.

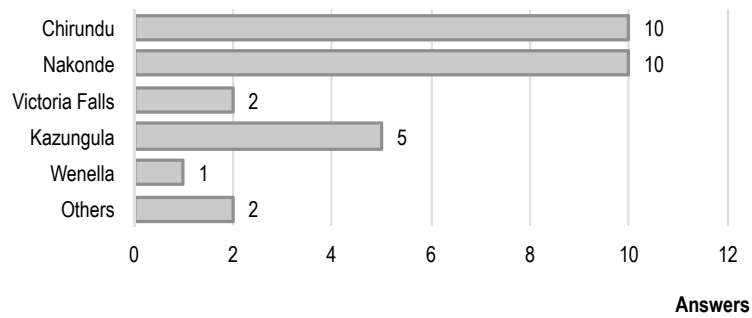
Major import port



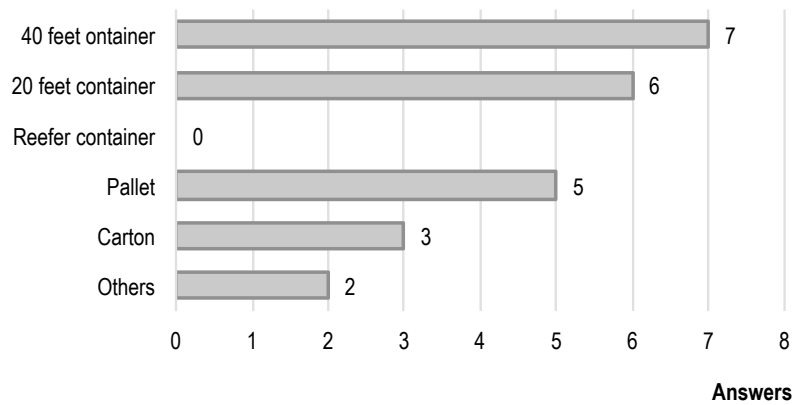
Kind of ship



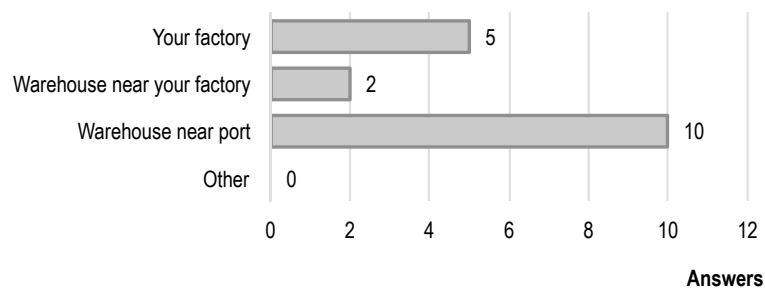
Main route (border post)

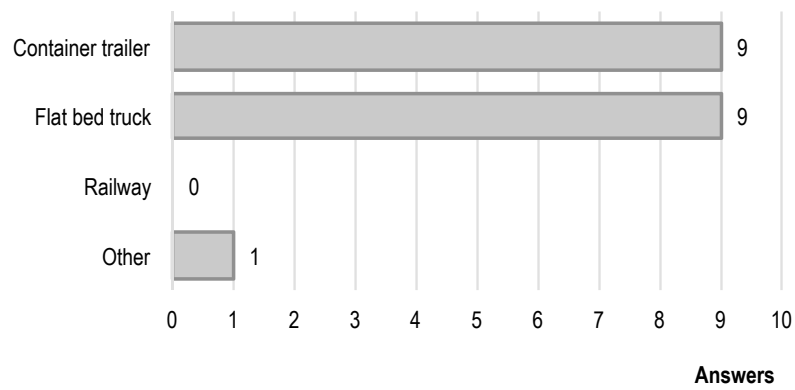
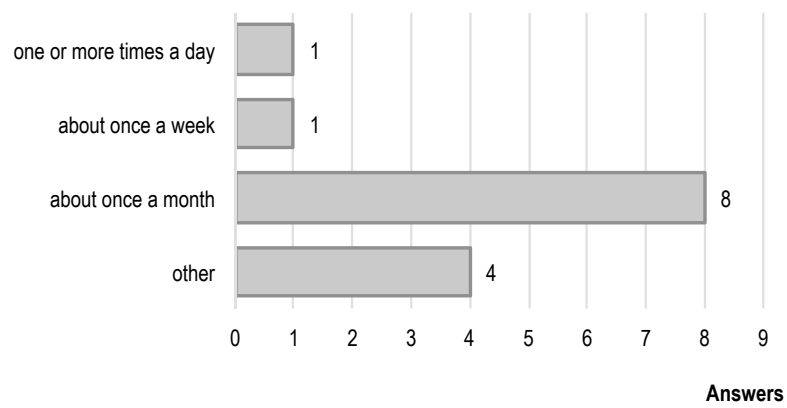


Main style of cargo at the time of arrival to port



Place of discharging from container

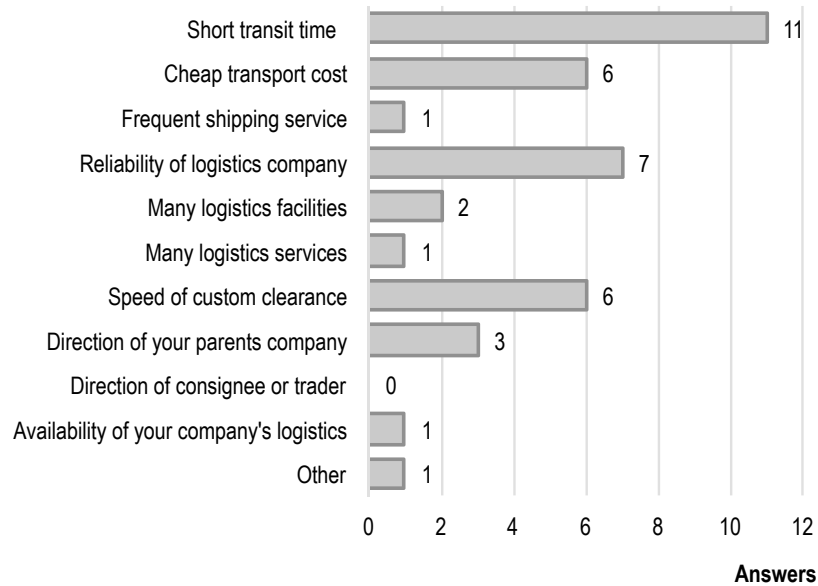


Main inland transportation method from port to factory**Frequency of arrival**

11.1.3.4 Q4: Reason to select present port and possibility to use a different port in future

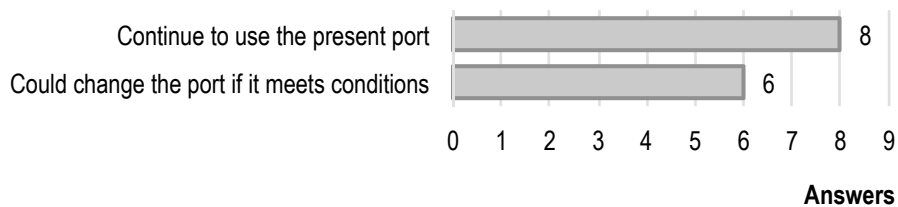
Q4-1: Please check the reasons for using the present port (select the major 3 reasons).

Main reasons of choosing port

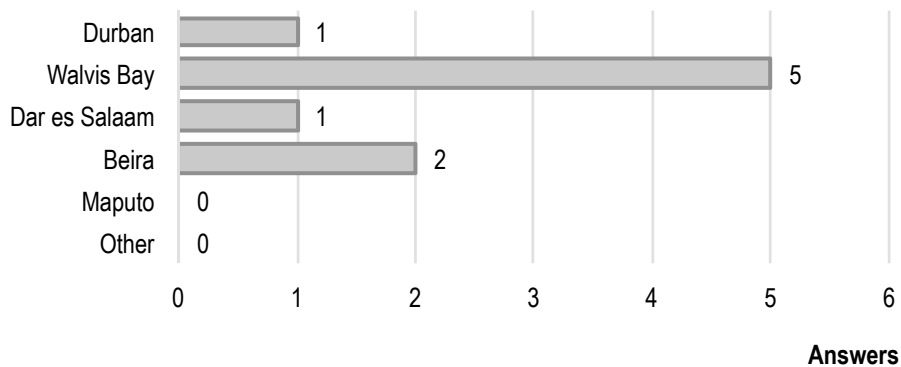


Q4-2 Please give future possibility to change the present port and the condition.

Future possibility to change the present port



If you change the present port, which port are you interested in?



11.2 Interview survey

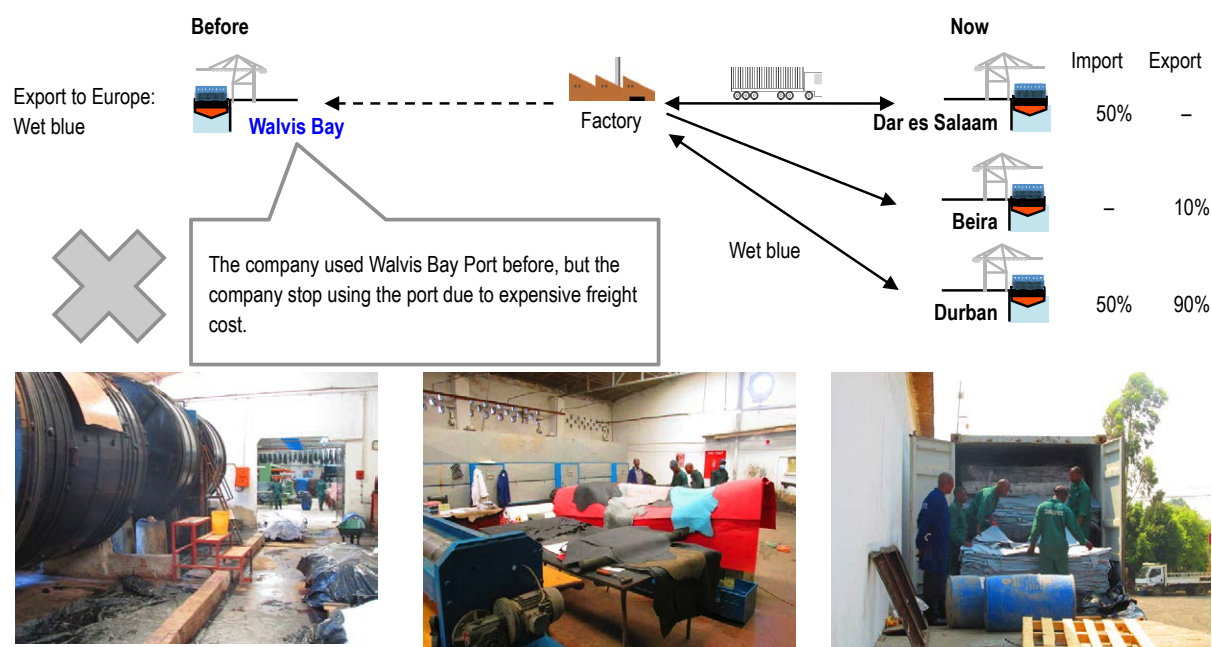
11.2.1 Company A

Company A was established as a subsidiary of Zambeef Products Plc in 1997, upon the acquisition of a tannery. It was created as a way to enable the utilization of raw hides resulting from the slaughter of cattle for the production of beef in the mother company by adding value and processing it into leather. The company is the largest producer of leather in Zambia, processing about 67 000 hides per annum in the tannery. 60% of the hides are processed into wet blue leather for export. The company includes a leather finishing and a shoe manufacturing plant. Export markets include South Africa, Europe and the Far East and average US\$1.3 million per annum.

Table 11.5: Overview of company A

| Items | Contents |
|-----------------|---|
| Main products | Wet Blue, leather product, shoe |
| Material import | India (shoe component, chemical), China (shoe component) |
| Export Market | China (wet blue), Spain (wet blue) |
| Current port | Import=Durban (50%), Dar es Salaam (50%) Export=Durban (90%), Beira (10%) |
| Walvis Bay | They had used Walvis Bay before, but due to expensive freight, they stopped using Walvis Bay. |

Source: JICA Study Team



Source: JICA Study Team

Figure 11.1: Overview of company A's logistics

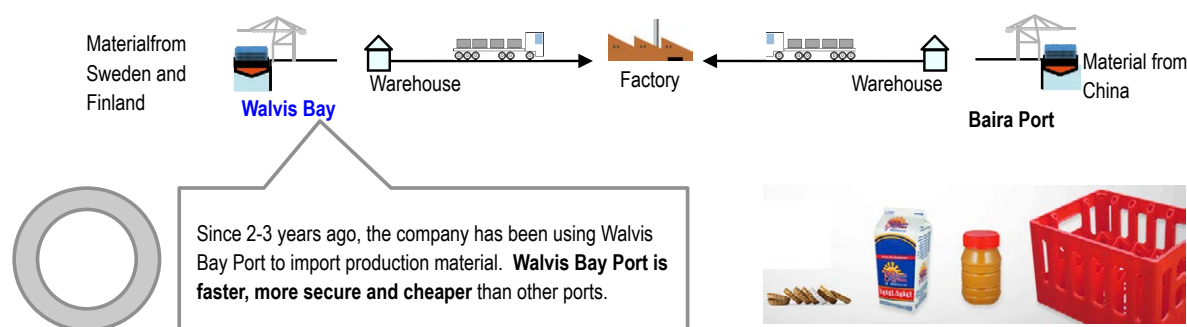
11.2.2 Company B

Company B, formerly a joint venture with British American Tobacco known as International Cartons and Packaging, was established in 1963 and began producing in 1967. It was consolidated into Nampak of South Africa. The company has two plants, one in Lusaka and the other in Ndola. The Lusaka plant has about 150 employees and Ndola about 60 employees.

Table 11.6: Overview of company B

| Items | Contents |
|-----------------|---|
| Main products | Conical carton for Sorghum Beer, Crown Cork and Plastic Bottle |
| Material import | Sweden, Finland (poly-coated board), China (Tinplate) |
| Export Market | Mainly domestic. Partly export to Uganda, Ghana, Nigeria, Zimbabwe, Malawi |
| Current port | Import: Walvis Bay (Sweden/Finland), Beira (China) Export: Durban (Ghana, Nigeria), by truck (Uganda, Zimbabwe, Malawi) |
| Walvis Bay | Since 2-3 years ago, they have been using Walvis Bay as material import port. Walvis Bay is faster, more secure and cheaper than other ports. |

Source: JICA Study Team



Source: JICA Study Team

Figure 11.2: Overview of company B's logistics

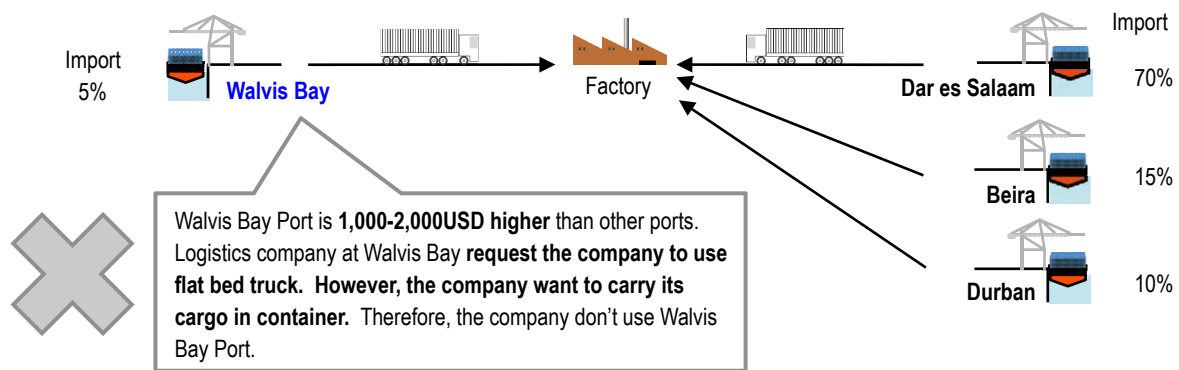
11.2.3 Company C

Company C was established in 1986 and is based in Lusaka where it has 7000m² of warehouse space and a Hammer Mill factory. Besides this, there are branches and warehouses in Mkushi and Kitwe. The main products are tractors, generators, pumps and hammer mills etc. Tractors were imported from Italy.

Table: 11.7: Overview of company C

| Items | Contents |
|-----------------|---|
| Main products | Tractors, generators, pumps and hammer mills |
| Material import | India, China, Italy |
| Export Market | Mainly domestic market. Partly Angola |
| Current port | Dar es Salaam (70%), Beira (15%), Durban (10%), Walvis Bay (5%) |
| Walvis Bay | Walvis Bay Port is 1,000-2,000 US dollar higher than other ports. Logistics company at Walvis Bay Port requested the company to use flat bed trucks. However, the company wanted to carry its cargo in containers. Therefore, the company stopped to use Walvis Bay Port. |

Source: JICA Study Team



Source: JICA Study Team

Figure 11.3: Overview of company C's logistics

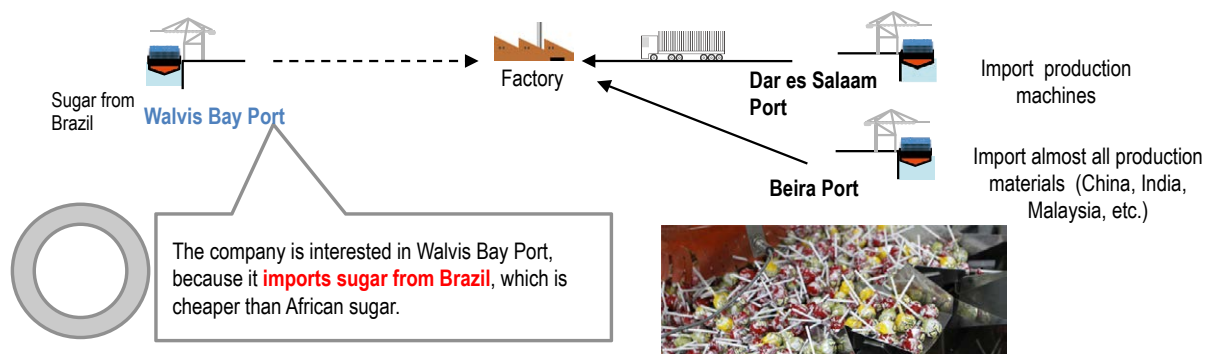
11.2.4 Company D

Company D was established in 1995. The main products are detergents and sweets. The company has 6 factories in Lusaka and 1600 employees. In addition to this company, the owner of the company manages 6 more production units and his companies employ a total of 6,000 persons.

Table 11.8: Overview of company D

| Items | Contents |
|-------------------|--|
| Main products | Consumer goods: detergents and sweets |
| Imported material | China and India (Sodium), sugar (Brazil) and Palm oil (Malaysia) |
| Export market | 60% of the products are exported to 8 countries in SADC and COMESA, and Australia, New Zealand, UAE and Qatar. 40% of the products are consumed in Zambia. |
| Current port | Beira (import almost all materials), Dar es Salaam (production machines) |
| Walvis Bay | The company is interested in Walvis Bay Port, because it imports sugar from Brazil, which is cheaper than African sugar. |

Source: JICA Study Team



Source: JICA Study Team

Figure 11.4: Overview of company D's logistics

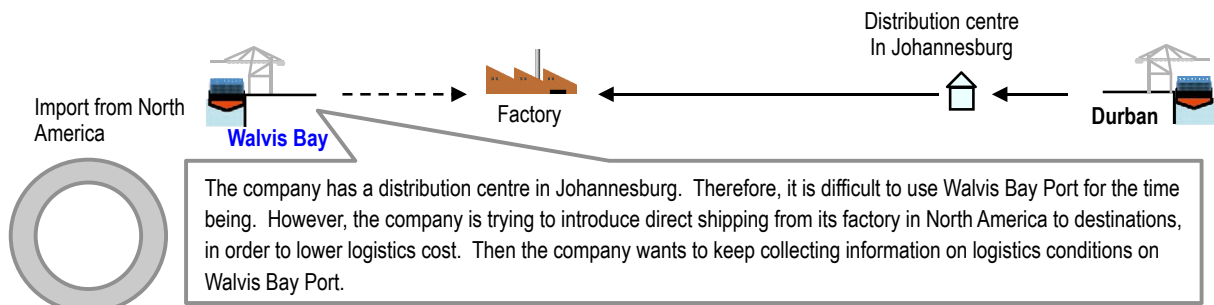
11.2.5 Company E

Company E was established in 2010 and began to operate a factory (20,000m²) to recondition used construction machines in 2012. The company employs about 150 staffs in the factory and mining sites in Zambia. The main customer is a copper mine in Lumwana.

Table 11.9: Overview of company E

| Items | Contents |
|-----------------|--|
| Main products | Construction machines |
| Material import | Japan, etc. |
| Export Market | Mostly domestic market. |
| Current port | Durban (100%) |
| Walvis Bay | The company has a distribution centre in Johannesburg. Therefore, it is difficult to use Walvis Bay Port for the time being. However, the company is trying to introduce direct shipping from its factory in North America to destinations, in order to lower logistics cost. Therefore the company wants to keep collecting information on logistics conditions on Walvis Bay Port. |

Source: JICA Study Team



Source: JICA Study Team

Figure 11.5: Overview of company E's logistics

12. Bypass and Truck Stop

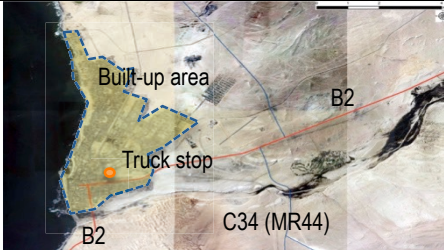
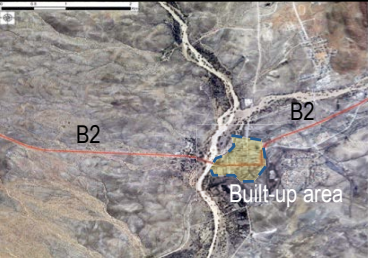

12.1 Current status and need of bypass and truck stop

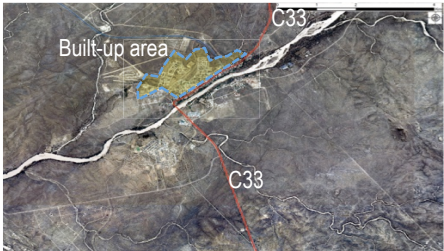

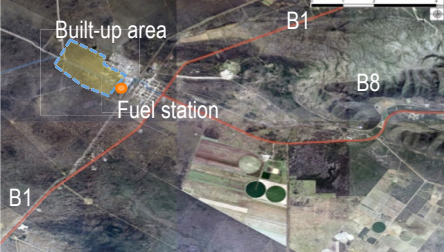
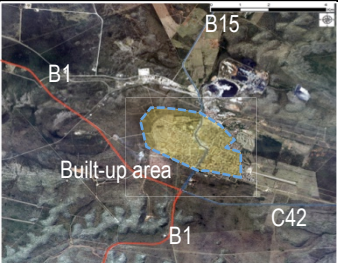
Towns where a bypass is required are to be selected along the following 3 criteria.

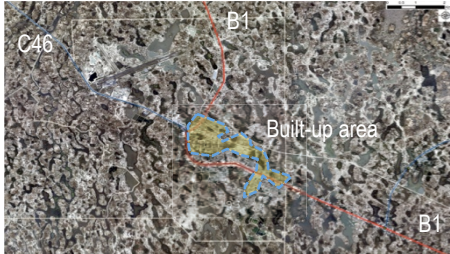
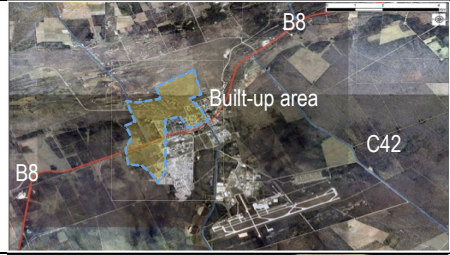
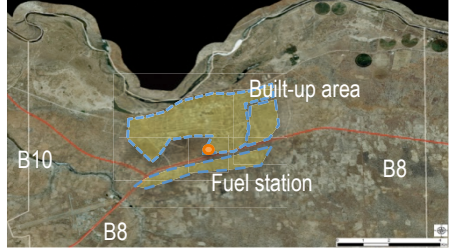
- A gap between current road capacity and future demand: From a viewpoint of smooth transport, once the traffic volume (Average Annual Daily Traffic; AADT) reaches 10,000 vehicles, it is better to develop a bypass road.
- Volume of large vehicles may threaten traffic safety in the town.
- Road alignment in the town and congested traffic cause a delay of passing vehicles.

Table 12.1 summarises town structure and future transport volume of all towns along Trans–Cunene and WNLDC.

Table 12.1: Current status and need of bypass and truck stop

| Corridors | Town | Satellite map | Road and built up area | Truck stop | Traffic volume in 2025 (AADT, rail oriented case) | Remarks |
|-----------|------------|--|---|--|--|---|
| WNLDC | Swakopmund |  | Although current B2 road passes through built-up area, current C34 road will be upgraded to MR44 to bypass the built-up area. | Truck stop with maintenance garage is located at the entrance of town. | 18,570 | Need to consider whether new truck stop is required since a new truck stop will be planned in Walvis Bay. And existing truck stop is in good condition, |
| | Arandis | No Image | B2 road pass outside built-up area. | No fuel station was observed along the B2 Road | 9,650 | Bypass and Truck stop is not necessary since town is off B1 road |
| | Usakos |  | B2 road passes through the built-up area with a 90 degree angled intersection. | There is at least 1 fuel station is along B2 road. However it is not possible for trucks to stay long. | 10,290 | |
| | Karibib |  | B2 road pass through the built-up area. A junction with B2 and C33 is located outside of the town. | A Fuel station and supermarket is located here but not enough space for allocating trucks. | 7,280 | |

| Corridors | Town | Satellite map | Road and built up area | Truck stop | Traffic volume in 2025 (AADT, rail oriented case) | Remarks |
|--------------|------------|---|--|---|--|---|
| | Omaruru |  | C33 road passes through the built-up area with 90 degree angled intersection | There is at least 1 fuel station in the town. However it is not possible for trucks to stay long. | 3,010 | |
| | Otiwarongo |  | B1 road passes through built-up area. A junction with C33 and C3 is located west of the built-up area and joins B1 in built-up area. | A shop and fuel station inside the town. | 7,930 | Structure plan formulated, truck stops are also proposed. |
| | Otavi |  | Junction with B1 and B8 located adjacent to built-up area. | A fuel station is located at junction with B1 and B8. | 7,930 | |
| Trans Cunene | Tsumeb |  | A junction of B1 and B15 is located south of the built-up area. | No fuel station was observed along the B1 road | 5,600 | |

| Corridors | Town | Satellite map | Road and built up area | Truck stop | Traffic volume in 2025 (AADT, rail oriented case) | Remarks |
|-----------|--------------|--|--|---|--|---------|
| | Ondangwa |  | B1 road passes through the built-up area. | Fuel stations were observed along the B1. However it is not possible for trucks to stay long. | 4,350 | |
| WNLDC | Grootfontein |  | B8 passes through the built-up area. C42 meet a junction in the east of town | Some fuel stations are observed along B8 road. However it is not possible for trucks to stay long | 2,330 | |
| | Rundu |  | B8 passes through built-up area (south of the road is informal settlements). B10 meet at the southwestern corner of built-up area. | Some fuel station is developed at the south gate of the built-up area. | 2,040 | |

Source: JICA Study Team; Satellite image from NSA

13. Strategic Environmental Assessment

13.1 Baseline Information on Lüderitz

13.1.1 Infrastructure

Lüderitz is the only harbour in the world that does not have a functioning railway connection between the port and its hinterland¹. Nevertheless, TransNamib recorded that 710 tons per day was transported by rail between Keetmanshoop and Lüderitz in 2013, and the JICA Study Team predicts this can rise to 940 tons per day by 2025 (up to 30% increase). The harbour currently exports zinc and lead concentrate from mines in the Karas Region and imports bulk suppliers for their processing plants. Fresh and frozen fish is also transhipped between vessels, road to aeroplane.

The final connection of the railway into the harbour is expected to be completed mid-2015. This will enable transshipment of 1 million tons of manganese a year, via barges to larger vessels anchored in deeper waters. A greenfield bulk terminal is planned at Angra Point.

13.1.2 Natural environment

The marine environment of Lüderitz Bay and the offshore areas immediately north and south lie within an intense upwelling cell, creating a node of high marine productivity which in turn results in strong fish populations, and large congregations of seabirds.

Namibian Islands' Marine Protected Area (NIMPA) stretches for about 400 km along the southern coast to a distance of about 30 km from shore, and includes all islands. Lüderitz Bay is included, but NamPort has jurisdiction over the area within the port limit (Figure 13.1). An MPA is "a defined area within or adjacent to the marine environment, together with its overlaying waters, and associated flora, fauna and historical and cultural features, which has been reserved by legislation, with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than its surroundings²". The management zoning for the Lüderitz Bay is shown in Figure 13.1.

¹ ASEC 2009. Social Aspects Of The New Rail Access To Lüderitz Harbour Scoping Report. Unpublished report, Alex Speiser Environmental Consultant CC.

² Currie H, Grobler CAF and Kemper J 2008. Namibian Islands' Marine Protected Area. Concept note, background document and management proposal for the declaration of Marine Protected Areas on and around the Namibian offshore islands and adjacent coastal area. Ministry of Fisheries and Marine Resources, Namibia.

MFMR 2010. The Namibian Islands' Marine Protected Area: Draft Operational Management Plan. Compiled by H.Currie and J.Kemper et al, for Ministry of Fisheries and Marine Resources, Namibia.

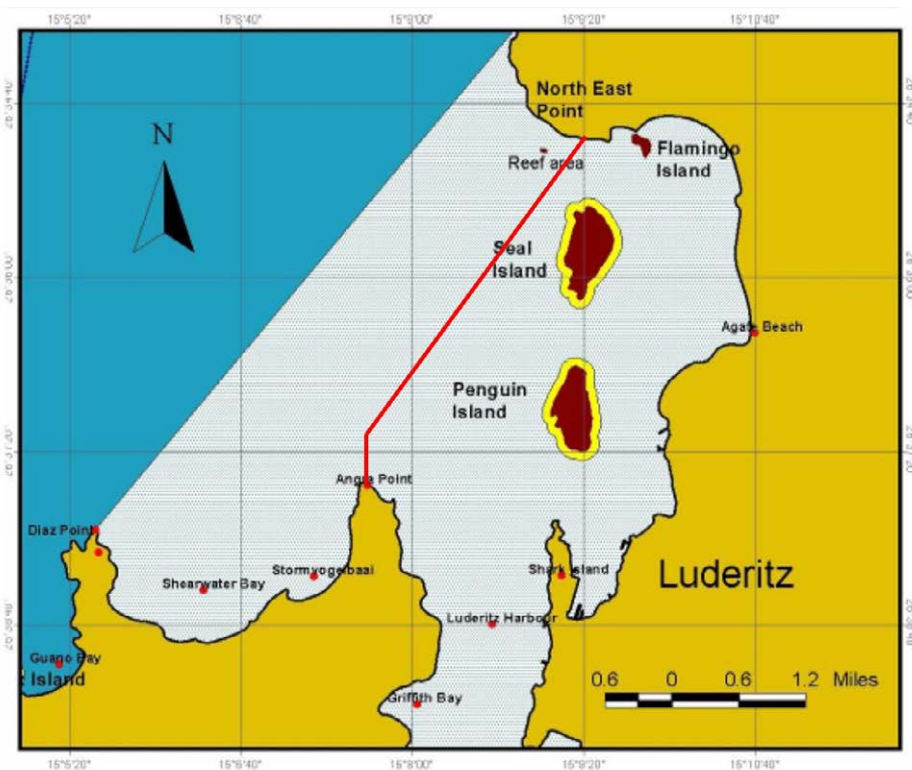


Figure 13.1: Zonation of the marine protected area within Lüderitz Bay

Note: Lobster fishing is prohibited in the grey area. Seal and Penguin Islands have the highest level of protection (Zone 4 = brown, surrounded by Zone 3 = yellow), with restrictions on access to the islands and sea-based activities around them. Red line shows the approximate present port limit.

Source: Currie et al 2008, MFMR 2010³.

The three over-arching objectives of the NIMPA here, as stated in the Draft Management Plan, are:

- Improve the conservation status of species of conservation significance
- Preserve ecosystem health and function
- Improve fisheries management.

The functions of the NIMPA, following from the objectives, include:

- Protection of the spawning and nursery grounds of lobsters and certain fish species, to promote recovery of the populations;
- Protection of the foraging and breeding requirements of various animals in the Benguela ecosystem, including a number of globally threatened seabirds and cetaceans such as Heaviside's Dolphin and the Southern Right Whale;
- Improved vigilance over shipping-related risks, risks such as oil spills and other pollution;

It is important that future developments in the Bay do not jeopardise these functions.

The Lüderitz Bay Islands – including Halifax, Penguin and Seal Islands – are recognised as an

³ Currie H, Grobler CAF and Kemper J 2008.
 MFMR 2010.

Important Bird Area (IBA)⁴. The rocky shore of the Bay, including the Peninsula, is included within the IBA. Key species that breed on the islands and elsewhere in the Bay⁵ are shown in Table 13.1 below. African Penguins breed on Halifax and Ichaboe Islands, and feed in the waters of the Bay, bringing them into frequent close contact with ships and any associated pollution.

Other bird species considered threatened in Namibia and found in the Lüderitz area include Greater and Lesser Flamingo (both VU in Namibia and both here for most of the year in various bays the wetland and the sewage outlet vlei, except when it's exceptionally wet inland), Black-necked Grebe (NT, flocks of up to 400 individuals close inshore between the harbour islands and Diaz Point), Eurasian Curlew (NT, small numbers at Second Lagoon and Radford Bay), Chestnut-banded Plover (NT, small numbers at Second Lagoon), Hartlaub's Gull (VU, resident breeder), Caspian Tern (VU, small numbers), Cape Gannet (CR, often seen foraging in Shearwater Bay in particular).

Table 13.1: Threatened birds found in the Lüderitz area

| Species | Threatened Status in Namibia | Presence and estimate of population in Lüderitz Bay |
|-----------------------------|------------------------------|---|
| African Penguin | Endangered | Up to 6,000, Halifax and Ichaboe Islands are 2 nd and 3 rd largest colonies of these birds in Namibia |
| Crowned Cormorant | Near-Threatened | |
| Bank Cormorant | Endangered | 3% of the world population |
| Cape Cormorant | Endangered | Up to 3500 pairs |
| African Black Oystercatcher | Near Threatened | 20% of the world population |
| Damara Tern | Near Threatened | ~20 nests on the Peninsula The Peninsula is also probably a stopover site on their migrations. |
| Greater and Lesser Flamingo | Both Vulnerable | Various bays and at the sewage outlet vlei |
| Black-necked Grebe | Near-Threatened | Flocks up to 400, between harbour islands and Diaz Point |
| Eurasian Curlew | Near-Threatened | Small numbers at Second Lagoon and Radford Bay |
| Chestnut-banded Plover | Near-Threatened | Small numbers |
| Hartlaub's Gull | Vulnerable | Breeding resident |
| Caspian Tern | Vulnerable | Small numbers |
| Cape Gannet | Critically Endangered | Forages in Shearwater Bay |

Source: Simmons et al 1998, Currie 2008, Simmons et al (in press)⁶.

The Lüderitz Peninsula holds about 14,000 shorebirds, and in the summer when migrants are in southern Africa, the density of shorebirds is about 30/km, which is not as high as in the Walvis Bay area but is locally dense⁷.

The Red list status of the species listed above reflects their decline, most importantly from depletion of their food sources⁸. Any additional threat, such as an oil spill disaster or disturbance to their breeding

⁴ Simmons RE, Boix-Hinzen C, Barnes KN, Jarvis AM & Robertson A. 1998. Important Bird Areas of Namibia. In: Barnes, K.N. (ed.), The Important Bird Areas of southern Africa. BirdLife South Africa, Johannesburg. pp. 295-332.

⁵ Cooper J and Robertson HG. 1980. Waders (Charadrii) and other coastal birds of the Diamond Coast and the islands off South West Africa. Madoqua 12(1): 51-57.

Hockey PAR. 1982. Waders (Charadrii) and other coastal birds in the Lüderitz region of South West Africa. Madoqua 13(1): 27-33.

Simmons RE, Boix-Hinzen C, Barnes KN, Jarvis AM & Robertson A. 1998.

Kolberg H. 2011. Wetland bird counts in Namibia 4: coastal wetlands. Lanieturdus 44(1): 9-12.

⁶ Simmons RE, Brown CJ & Kemper, J (in press). Birds to watch in Namibia – Red, rare and endemic species.

⁷ Hockey PAR. 1982. Waders (Charadrii) and other coastal birds in the Lüderitz region of South West Africa. Madoqua 13(1): 27-33

Simmons RE, Boix-Hinzen C, Barnes KN, Jarvis AM & Robertson A. 1998.

⁸ Roux J-P 2003. Risks. In: Molloy F, Reinikainen T (eds). Namibia's marine environment. Directorate of Environmental

areas, could have a critical impact on the populations that are already severely depressed, particular those that are breeding residents in the area, such as African Penguin, Cape Gannet, Bank Cormorant and Cape Cormorant.

Cetaceans (dolphins and whales) are well represented in the Bay area⁹. Heaviside's Dolphin, a species that is endemic to the Benguela ecosystem, is locally very common and they use the bay as a breeding area. Worldwide populations of Southern Right and Humpback Whales are extremely depressed but now are on a slow recovery, and both these species are increasingly seen in the Bay.

The marine environment in Lüderitz Bay is well suited to mariculture as the water quality is good (low level of pollutants) and this area is less prone to red tides and sulphur eruptions, that occasionally have disastrous consequences on the oyster farms in Walvis Bay.

The terrain of the Peninsula is hilly and rocky with small sandy valleys and plains. It hosts low vegetation classified as dwarf shrubland, and has surprisingly high plant diversity. This is the motivation for the inclusion of the Peninsula as an Important Plant Area¹⁰. The Sperrgebiet Land Use Plan¹¹ lists botanical sensitivity in the Lüderitz area as "HIGH", with the Peninsula having "VERY HIGH" conservation importance due to the high species diversity as well as numerous protected, endemic and range-restricted plant species¹².

The Peninsula has varying numbers of typical desert herbivores such as springbok, ostrich and oryx. More specialised for this area are Brown Hyena (Near-Threatened), which occur at high density along the Sperrgebiet coast, including at the Lüderitz Peninsula¹³. The habitat is also known to host a relatively high diversity of small reptiles, such as geckos, some of which are Namibian endemics with very restricted ranges. In years when rain falls in the area, Ludwig's Bustard (Endangered) breeds in the secluded sandy valleys and plains on the Peninsula and inland.

Tourism initiatives on the Peninsula are relatively small but have great potential. Recreational fishing, including lobster fishing, happens at a few of the bays. Boat cruises focus on the dolphins and views of the seabird and seal colonies on the islands. The stone cross at Diaz Point marks the place where the Portuguese explorer, Bartolomeu Diaz, landed on the southern African coast in 1488. Refreshment and camping facilities are available here. Many tourists make the trip out to Diaz Point

Affairs of the Ministry of Environment and Tourism, Windhoek, Namibia.

⁹ Roux J-P 2003.

¹⁰ Hofmeyer, W. (Ed.) 2004. Proceedings of the Important Plant Areas workshop. NBRI, Windhoek.

¹¹ MET 2001. The Sperrgebiet Land Use Plan (2nd Draft). Unpublished report by The Sperrgebiet Consortium, Windhoek, to the Ministry of Environment and Tourism.

¹² Burke A. 2004. A preliminary account of patterns of endemism in Namibia's Sperrgebiet – the succulent Karoo. *Journal of Biogeography* 31: 1613-1622.

Burke, A. 2006. The Sperrgebiet. Managing its biodiversity. Enviroscience, Oranjemund and Namibia Nature Foundation, Windhoek.

¹³ Wiesel I 2006. Predatory and foraging behaviour of brown hyenas (*Parahyaena brunnea* (Thunberg, 1829)) at Cape fur seal (*Arctocephalus pusillus pusillus* Schreber, 1776) colonies. PhD thesis, University of Hamburg, Germany.

Kuhn BF, Wiesel I, Skinner JD 2008. Diet of brown hyaenas (*Parahyaena brunnea*) on the Namibian coast. *Transactions of the Royal Society of South Africa* 63: 150-159.

and pay little attention to other attractions on the way, such as dolphin watching, specialised succulent plants, shell middens representing the presence of hunter-gatherers on these shores hundreds of years ago, and historical features such as an old whaling station. The point is that Lüderitz residents and visitors have very few options for outdoor recreation, and the Peninsula offers great potential for that.

The above description shows that there is significant biodiversity and tourism value in the general area of Lüderitz Bay, both in the terrestrial and marine environments. This was not emphasised in the Baseline Report, hence its description here. Important components are:

- High density of Red Data bird species, especially breeding colonies on the islands,
- Local abundance of dolphins and occasional presence of whales in the Bay,
- Vegetation diversity and endemism on the Peninsula, and
- Huge tourism potential, which is not yet realised by the sector.

13.2 Issues and Response

Comments and inputs were invited to the Proposed Master Plan, during the Scoping Phase (October to December 2014) and after disclosure of the Draft SEA Report (mid-January 2015). All **inputs**, both written and given verbally during the various public meetings, are listed in the Table below. **Response** explains how the input has been taken up in the Final SEA Report (February 2015). In some cases, a comment is inappropriate (e.g. because it is off the point) or too general to be specifically addressed. In these cases it is stated that the response is ignored i.e. it is not addressed.

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|---------------------------------------|--------------------------|--|
| Scoping - Project description Comment: Quality of roads and railways a concern, both need much upgrading. Also port upgrading. All of these will take time and high costs. | Windhoek Scoping Meeting 9-10-2014 | NP du Plessis, Namwater | Agree, but the comment is general and beyond the scope of the SEA. Ignore. |
| Scoping – Additional impacts or issues Comment: Transmission of diseases into Namibia along transport routes. | Windhoek Scoping Meeting 9-10-2014 | NP du Plessis, Namwater | Issue assessed in Sec 5.2.2 Social and health impacts; Sec 6.6.8 Increased STDs and parasitic infections along corridors |
| Scoping – Additional impacts or issues Discussion: Truck stops on bypass routes may take business away from shops in small towns. Such towns may actually want the increased traffic to go through the towns rather than around them. They may even want the 'bottlenecks' so that drivers decide to stop and buy goods. Bypass routes could then be a disadvantage for small struggling towns. | Windhoek Scoping Meeting 9-10-2014 | All meeting participants | Issue assessed in Table 6.1, point 6.1.7 Industrial service road bypasses. Sec 6.6.9 Stimulation of local economies |
| Scoping – Additional impacts or issues Comment: Increased traffic along corridors, a safety issue for children and livestock. | Windhoek Scoping Meeting 9-10-2014 | NP duPlessis, Namwater | Issue assessed in Table 6.1, point 6.1.6 Upgrading of roads in corridors 6.6.7 Increased road accidents |
| Scoping – Additional impacts or issues Comment: Increased water consumption as hub towns expand. | Windhoek Scoping Meeting 9-10-2014 | J.Sirunda, Namwater | Issue assessed in Table 6.1, point 6.1.1 and 6.1.2 harbour upgrades and expansion 6.5.5 Increased use of water resources |
| Scoping – Additional impacts or issues Comment: More freight on roads will mean roads will need more maintenance. The MP should emphasise that most freight should be sent by rail. | Windhoek Scoping Meeting 9-10-2014 | NP duPlessis, Namwater | Increased maintenance addressed in Sec 6.6.3, 6.6.5, 6.6.6. The road-rail balance is taken up directly in the project design – Sec 3.4 Modal share scenarios |
| Scoping – Additional impacts or issues Discussion: Industrialisation might jeopardise tourism figures. | Windhoek Scoping Meeting 9-10-2014 | All meeting participants | Issue addressed in Sec 6.5.4 Degradation of sense of place |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|--|------------|--|
| Scoping Upgrading of the Walvis Bay-Swakopmd road behind the dunes has been on the cards for years now – this must be done now urgently, there are continuing bad accidents on the coastal road. This plea must be taken to RA to make this a priority. | Walvis Bay Scoping Meeting 14-10-2014 | B.Uakumbua | Upgrading of M44 is included in the Master Plan – see this report Sec 3.6.1 |
| Scoping W Bay Transport Master Plan proposes some changes to the road network – these must be taken up in this Master Plan. E.g. the routing to the new port is not shown accurately on the JICA map. | Walvis Bay Scoping Meeting 14-10-2014 | Anonymous | (Response by JICA Study Team) W Bay Transport Master Plan is not yet finalized that makes the Master Plan impossible to refer at the moment. In the future the results will be reflected. |
| Scoping South African ports are presently not coping with local demand, let alone importing/exporting for neighbouring countries. Ports such as Walvis Bay, Luanda, and Dar es Salaam are all growing to cater for these needs. There is region-wide expansion in logistics. Walvis Bay is becoming recognised as the top port in western Africa, and this is changing trade routes. E.g. there is a requirement for a dry port for DRC goods. There will also be fuel imports in future. | Walvis Bay Scoping Meeting 14-10-2014 | Tony Raw | Noted, no response needed. |
| Scoping This Master Plan must be fully integrated with other growth plans for Walvis Bay, such as the Heavy Industry zone on Farm 58, ITZ proposals. | Walvis Bay Scoping Meeting 14-10-2014 | Tony Raw | Noted. The situation of the proposed Logistics Hub Centre will consider all relevant factors. See Sec 6.4.2 |
| Scoping - Bilateral agreements with our neighbours should also be refined to facilitate trade. | Walvis Bay Scoping Meeting 14-10-2014 | Tony Raw | Noted. |
| Scoping – SEA process The SEA should be advertised in the press so that community members can also know about it, not just the people identified in our stakeholder list. Briefings to the business community (run by NPC + JICA) will have helped but not adequate for reaching community members. | Walvis Bay Scoping Meeting 14-10-2014 | B.Uakumbua | The public consultation process included a press article published in Namibia's 4 main newspapers. See Sec 5.1 |
| Scoping – environmental impacts Nacoma has compiled EMPs for all the coastal towns, we should consult these if we need further baseline info or ways that the towns are dealing with current issues. Nacoma will also be calling for an SEA for the central coastal development hub within the next few months. | Walvis Bay Scoping Meeting 14-10-2014 | R.Braby | Noted. The coastal town EMPs by Nacoma were used in this assessment. |
| Scoping – additional impacts Transport of hazardous substances will happen on our roads, making traffic accidents more dangerous. There will possibly also be trafficking of illegal goods. | Walvis Bay Scoping Meeting 14-10-2014 | B.Uakumbua | Addressed in Sec 6.5.3 |
| Scoping – additional impacts The relatively new Bird Paradise (presently far outside of town but due to become surrounded by urban build-up and industrial zones) will become increasingly isolated. Power lines and other developments will have negative impacts on birds moving between this area and the coast. | Walvis Bay Scoping Meeting 14-10-2014 | R.Braby | Addressed in Sec 6.5.2 |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|--|--------------------------------|---|
| <p>Scoping – additional impacts The SEA predicts greater strain on social services. Note that growth and greater income to the towns could also bring about improved social services.</p> | <p>Walvis Bay Scoping Meeting 14-10-2014</p> | <p>Tony Raw</p> | <p>Noted, addressed in Sec 6.5.8</p> |
| <p>Scoping – additional issues T.Raw suggested prior and present studies that will help the SEA to identify impacts, such as</p> <ul style="list-style-type: none"> • Transportation Master Plan – get from Johnny Smith • NDC Business parks – get from Koos van Staden • NamPort EIAs, get from Elsevir Gelderblom, and present SEA for North Port being done by GeoPollution Technologies. • Rail expansion plans, get from Robert Kalomho • Power requirements; get from ECB, Francois Robinson. | <p>Walvis Bay Scoping Meeting 14-10-2014</p> | <p>Tony Raw</p> | <p>Noted, references and contacts consulted in the process where appropriate.</p> |
| <p>Scoping – project description M.Kooper emphasised that the South is often neglected, this should not be allowed to happen with this new Logistics Master Plan – Lüderitz must be fully included as an important component in the whole. This was re-iterated in the SEA meeting by the Lüderitz CEO, Aune Gideon. Lüderitz can serve SA and southwestern Botswana. Some JICA maps were criticised for not including Lüderitz. The slide showing timeliness and cost factors is based on Walvis Bay – how does Lüderitz compare? If Walvis Bay experiences some disaster, Lüderitz can act as Namibia’s ‘plan B’. This requires investment in the port ahead of demand.</p> | <p>Lüderitz Scoping Meeting 16-10-2014</p> | <p>Max Kooper, NamPort</p> | <p>Noted</p> |
| <p>Scoping – project description Before the final draft for the Logistics MP is submitted, there must be a meeting in Lüderitz, including all the Councillors, to ensure there is full local buy-in and to ensure that Lüderitz is properly represented in the MP.</p> | <p>Lüderitz Scoping Meeting 16-10-2014</p> | <p>A.Gideon</p> | <p>NPC Deputy PS has visited Lüderitz and held discussions.</p> |
| <p>Scoping – project description Additional structures planned for Lüderitz:</p> <ul style="list-style-type: none"> • Rail network expansion within the port area and to the proposed Deep Sea Port at Angra Point • Lüderitz Boatyard rehabilitation • Lüderitz Corridor Development Initiative (similar to WBCG) • Upgrade to Reefer terminal • LPG gas facility • New port at Angra Point – mainly for Mn exports from Northern Cape. | <p>Lüderitz Scoping Meeting 16-10-2014</p> | <p>NamPort representatives</p> | <p>Noted</p> |
| <p>Scoping – project description Railway line has been upgraded from Aus – Lüderitz (almost complete) but there is still a stretch between Keetmanshoop and Aus that is not up to standard.</p> | <p>Lüderitz Scoping Meeting 16-10-2014</p> | <p>NamPort representatives</p> | <p>Noted</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|--|---------------------------------|------------------------------------|
| Scoping – Findings from Baseline study Angra Point is part of the Peninsula Protected Area and Lüderitz Marine Protected Area. The area has not yet been made available for port developments by MET or MFMR. | Lüderitz Scoping Meeting 16-10-2014 | JP Roux | Noted |
| Scoping – Findings from Baseline study There is an additional area of high concern – the Lüderitz Peninsula. Not just two critical areas, as the Baseline Report stated, but three | Lüderitz Scoping Meeting 16-10-2014 | J. Kemper | Addressed in Sec 4.2.3 |
| Scoping – Additional impacts <ul style="list-style-type: none"> • JP Roux – The Peninsula is v valuable in biodiversity and for tourism, even though tourist potential not fully realised. Industrialisation could kill that potential. • Two endemic plant species confined to the Peninsula, and the area is a hotspot for succulent plants. Northern-most rocky coastal habitat in the Succulent Karoo. • Red Data birds that depend on a healthy marine ecosystem in the Bay and around the islands, and that nest / roost on the Peninsula: Damara Tern, Cape Gannet, Bank Cormorant, Crowned Cormorant, African Penguin, African Oystercatcher. Also other migrants that stop off here • Tourist boats use Heaviside’s Dolphins and Africa Penguins as part of the attractions on their bay tours. • Archaeological and historical heritage – shell middens, remnants of old whaling station. • Lüderitz Bay is the centre of the Marine Protected Area, it has good quality, clean sea water, ideal for mariculture which is more successful here than in Walvis Bay. • Bay is used for recreational activities, one of the few places that Buchters can get outdoors. Recreational and subsistence fishing takes place. Deep Water Port and the storage areas on the peninsula jeopardise many of these assets on the Peninsula. 890ha area of land identified – alternative sites and areas must be considered. | Lüderitz Scoping Meeting 16-10-2014 | JP Roux | Addressed in Sec 4.2.3 and Sec 6.5 |
| Scoping – Additional impacts Lüderitz critically needs the development and economic opportunities, so we need to consider these vulnerabilities and other options. All stakeholders must figure this out together. | Lüderitz Scoping Meeting 16-10-2014 | C. Kamupingene and A. Gideon | Noted. |
| Scoping – Other issues and cumulative impacts Potential phosphate mining a major negative impact, with strong potential for significant negative cumulative impacts. Both marine and land-based operations | Lüderitz Scoping Meeting 16-10-2014 | J. Kemper | Noted. |
| Scoping – Other issues and cumulative impacts We need to understand the potential risks of the port development on the natural resource assets. | Lüderitz Scoping Meeting 16-10-2014 | C. Kamupingene | Noted. |
| Scoping – Other issues and cumulative impacts Much of the storage space in the port should be covered. Prior feasibility work has been based on open-air facilities | Lüderitz Scoping Meeting 16-10-2014 | Max Kooper | Noted. |
| Scoping – Other issues and cumulative impacts Engineering aspect: the winds at Angra Point are much stronger than in the present harbour | Lüderitz Scoping Meeting 16-10-2014 | JP Roux | Noted. |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|---|------------------------|--|
| Scoping – Other issues Trucks in southern Angola enter Namibia, use our good quality tarred road between Oshikango and Katwitwi, and then continue in Angola. They lead to road deterioration, accidents, traffic jams at the borders, and Namibia gains very little. | Oshikango Scoping Meeting 28-10-2014 | P. Nghikembua | Noted. |
| Scoping – Other issues The Logistics Master Plan and the Spatial Development Framework of Helao Nafidi Town should be integrated. | Oshikango Scoping Meeting 28-10-2014 | I. Ipinge | Noted. |
| Scoping - Impacts <ul style="list-style-type: none"> Increased traffic and trade likely to stimulate economic opportunities and growth. This is seen as a positive, but there are concerns that the opportunities will be grabbed by foreigners and/or the elite, to the detriment of locals. Concern that shortage of suitable land for development, and the rising cost of such land, will limit optimisation of benefits, and further disadvantage locals. Currently, the only real growth areas in Katima Mulilo are retail, with additional shopping malls being erected. Some see this as development, but others recognise that it results in leakage as most retailers are either South African (e.g. Shoprite, Checkers, Pick n Pay), while others are Chinese. Participants bemoaned the fact that there are limited traditional markets, pointing out that these would attract tourists, provide opportunities for locals and at the same time reduce economic leakage. Whilst job prospects will likely improve, with resultant social benefits, concerns are that foreigners will dominate. | Katima Mulilo Scoping Meeting 30-10-2014 | Anonymous participants | Capture of trade and entrepreneur opportunities by wealthy people and foreigners - Addressed in 6.5.9. |
| Scoping - Impacts The area needs to do more regarding agriculture, since water and soils are available. The Master Plan could stimulate agriculture through improved transportation. | Katima Mulilo Scoping Meeting 30-10-2014 | Anonymous participant | Noted |
| Scoping - Impacts Increased road transport, especially long haul trucks, will likely increase spread of HIV and AIDS | Katima Mulilo Scoping Meeting 30-10-2014 | Anonymous participant | Agree. Addressed in Sec 6.5.7 and 6.6.8 |
| Scoping – Impacts For the master plan to benefit Namibia adequately, there needs to be investment in training and skills development. Skills amongst locals are inadequate at present. | Katima Mulilo Scoping Meeting 30-10-2014 | Anonymous participant | This is addressed by the Master Plan. See Sec 3.1.2 in this report. |
| Scoping – Impacts Main concern is balancing envisaged industrial growth with current nature-based tourism, which is based on the area's comparative advantages of intact natural habitats and wildlife. Participants agreed that a balance can be found through proper zonation, where the two antagonistic sectors are kept apart. For example, KM can be an industrial hub, but the wilder areas (e.g. national parks and conservancies), must be zoned for wildlife and tourism. | Katima Mulilo Scoping Meeting 30-10-2014 | Anonymous participants | Addressed in Sec 6.5.4 |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|---|--------------------------------|--|
| <p>Scoping – Impacts</p> <p>Increased traffic and trade will place more pressure on roads, which are already deteriorating. If we do not capture the benefits of such trade, we will only carry the costs</p> <p>Border posts and customs officials will come under increasing pressure. Current facilities and staff at border crossings will not be able to cope. Expansions to both will be required.</p> | <p>Katima Mulilo Scoping Meeting 30-10-2014</p> | <p>Anonymous participants</p> | <p>Noted</p> |
| <p>Scoping – Impacts</p> <p>The pressure on the corridor between Walvis Bay – Usakos will be greater than anywhere else in the country as it is common to all four corridors. Need a dual carriage road for this stretch. Need to develop railway infrastructure and capacity as an alternative to road transport for goods.</p> <p>What will happen in the interim, before these further developments take place: already there is an increasing number of trucks with large loads. Consider a truck-free time zone for normal vehicles, e.g. 6h00-12h00? Many trucks are empty one way; how to address this – incentives for coordination/synergies?</p> <p>Urgently need to enforce road safety laws as a matter of promoting human safety. Increase staff capacity and public awareness, training to increase standards for drivers' licences. Introduce deterrents (spot fines and licence suspensions) for offenders who do not obey stop signs and jump red robots. Bring in two-phase robots in towns/cities; document perpetrators on camera.</p> <p>Pollution from diesel locomotives already occurs and is a cause for concern.</p> <p>Need to maintain picnic sites – litter and shade covers.</p> | <p>Email 13-10-2014</p> | <p>Mike & Ann Scott</p> | <p>The suggestions to upgrade the Walvis Bay-Usakos section to 4 lanes, and to send a higher proportion of cargo by rail, are addressed in the Master Plan.</p> <p>Truck-free time zones? Noted as a possible Mitigation Sec 6.6.7.</p> <p>Road safety addressed in Sec 6.5.6 and 6.6.7</p> <p>Pollution addressed in Sec 6.5.3</p> <p>Sense of place and road maintenance addressed in Sections 6.6.5 and 6.6.6</p> |
| <p>Scoping</p> <p>Are we not going to create smaller towns by developing these truck stops? I am saying this because a lot of people will see these stops as viable market places thus, we will end up with truck stops being turned into towns flooded with hawkers, hookers, and drug dealers.</p> | <p>Email 15-10-2014</p> | <p>Kleopas Kantika, Nacoma</p> | <p>Agree, larger and new truck stops will probably attract informal sellers. The Mitigation recommendations (Sec 6.5.6) state that truck stops should be well managed and should provide appropriate facilities as a measure to minimise illegal activities.</p> |
| <p>Coordination with Local Authorities</p> <p>How will developments at border posts and other towns (e.g. border infrastructure, truck stops) be coordinated with Local Authorities?</p> | <p>Windhoek Disclosure Meeting, 26-01-2015</p> | <p>C. Tubaleki, MRLGHRD</p> | <p>The SEA and the SEMP note that developments in towns must be properly planned with local institutions. Also, the SEA and SEMP note that an EIA will be required for every such development, where public consultation will also be required.</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|--|--|---|
| <p>Coordination with neighbouring countries Coordination of this Master Plan in Namibia is needed with other national plans of neighbouring states (e.g. the bottleneck for transport going through Kazungula border post). How will this be achieved?</p> | <p>Windhoek Disclosure Meeting, 26-01-2015</p> | <p>C. Tubaleki, MRLGHRD</p> | <p>The Master Plan notes the need for integration with developments in other countries. The SEA notes as a constraint that cross-border impacts are not assessed, and that the influence of logistics developments in neighbouring countries will strongly influence the success of the Plan in Namibia.</p> |
| <p>Opportunity costs The SEA should include costs and benefits of the Master Plan in real terms. Including opportunity costs.</p> | <p>Windhoek Disclosure Meeting, 26-01-2015</p> | <p>C. Tubaleki, MRLGHRD</p> | <p>This would be a very difficult exercise involving economist specialists, so is not do-able in the available time. It would also go beyond the TOR for the SEA. Response by S. Kawahara: Opportunity costs must be considered in the context of the greater benefits that the project will bring to the whole country. If implementation is successful, the boost to trade and employment will make the costs carried now, insignificant.</p> |
| <p>Pollution risks What measures are being put in place to reduce the risks of transporting dangerous goods e.g. coal from Botswana (coal dust blowing off wagons), nuclear materials (from uranium mines)...?</p> | <p>Windhoek Disclosure Meeting, 26-01-2015</p> | <p>B. Kohrs, Earthlife</p> | <p>The SEA notes this risk and makes mitigation recommendations. But we agree the risks cannot be completely removed. Response by C. Smith (WBCG): The Master Plan includes key elements for maintaining and improving transport safety standards. Namibia can still decide what sort of freight to carry, so we do not expose the country to unreasonable risks.</p> |
| <p>Accident risks Re-emphasize increased risk of accidents</p> | <p>Windhoek Disclosure Meeting, 26-01-2015</p> | <p>V. Mbai, Polytechnic Logistics Centre</p> | <p>Agree, this impact is real and it is difficult to mitigate. The SEA makes recommendations on enforcing speed limits, and on trying to reduce the linear spread of settlements along roads so that children and livestock are not exposed to greater risk.</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|--|--|---|
| <p>Impact on scarce water resources What is the cumulative impact of this project on Namibia's scarce water resources?</p> | <p>Windhoek Disclosure Meeting, 26-01-2015</p> | <p>B. Kohrs, Earthlife</p> | <p>The project overall will not cause water consumption to increase above normal growth rates. Gradually increasing water demand is accommodated in the water management activities of GRN and NamWater. Construction projects will cause small peaks in water consumption but these are not significant increases overall. The SEMP notes that every individual project in this overall Master Plan will require an EIA, and that projects should avoid excessive pressure on surface and ground water resources. Response by Dudley Biggs (retired Director from Department of Water Affairs, MAWF): Logistics activities do not place a heavy demand on water resources.</p> |
| <p>Project description – Walvis Bay coal terminal? The project description does not include the coal terminal for export of Botswana coal through Walvis Bay. Is this project included?</p> | <p>Walvis Bay Disclosure Meeting, 27-01-2015</p> | <p>A. Burger, Walvis Bay Municipality Engineer</p> | <p>The Master Plan focuses on light freight, not bulk. Assessment by the JICA Study Team shows that the bulk coal project is unlikely to materialise within the project horizon of the Master Plan (next 10 years).</p> |
| <p>Project description – integration with Walvis Bay IUSDF The IUSDF does not include the Master Plan proposal for the Logistics Hub Centre in 'Triangle'. This needs to be resolved</p> | <p>Walvis Bay Disclosure Meeting, 27-01-2015</p> | <p>A. Burger, Walvis Bay Municipality Engineer</p> | <p>Noted</p> |
| <p>Project description – integration with Walvis Bay IUSDF The SEA must be aligned to the IUSDF plans.</p> | <p>Walvis Bay Disclosure Meeting, 27-01-2015</p> | <p>S. Uushini</p> | <p>Noted</p> |
| <p>Project description – integration with existing Walvis Bay harbour developments The Dry Ports presently under consideration (for Zimbabwe and Zambia) also need to be included in the Master Plan.</p> | <p>Walvis Bay Disclosure Meeting, 27-01-2015</p> | <p>R. Eksteen, international consultant</p> | <p>Noted</p> |
| <p>A proposal at Oshikango At Oshikango, the proposed truck stop is a long way from the existing railway terminus. It will be expensive and inefficient to have to transport cargo from one mode to the other through Oshikango.</p> | <p>Walvis Bay Disclosure Meeting, 27-01-2015</p> | <p>S. Shoopala. Woker Freight Services</p> | <p>Noted</p> |
| | | | |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|---------------------------------|-----------------------|--|
| <p>Executive Summary – Aviation upgrades Comment: I am not sure whether shutting down Lüderitz airport would constitute an "upgrade". At the moment this is the only transport alternative to road. Even if the railway does resume, it is doubtful whether it will provide a useful and viable passenger service. At the moment the airport is used by (a) Air Namibia to carry tourists, fishing industry management and mining industry management people (b) oil companies shuttling crew to exploration sites (c) little planes carrying tourists. I don't necessarily want to encourage industry to have an airport base here (because I am not encouraging industrial development here), but it is something that needs to be considered.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>It is not proposed to shut down the unprofitable local airports in the Master Plan. This is clarified and revised in SEA final report (Sec 3.6.4). The Master Plan suggests that NAC sheds its unprofitable airports (Lüderitz is one of them), but recognises that they could be retained for the social functions they serve, with tax money not by cross subsidies of NAC and Air Namibia.</p> |
| <p>Exec Summary – Impacts of Master Plan in section 6.5 "This impact, and the possible disturbance and pollution risk to birds and cetaceans in Lüderitz Bay..." Addition: ...and the possible displacement, disturbance and pollution risk...</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Added</p> |
| <p>Sec 2.2.1: Trans-boundary impacts not included "The Terms of Reference for this SEA did not require the consideration of trans-boundary impacts. A logistics plan of this nature clearly has trans-boundary implications, especially during its "implementation phase". However, it remains unknown whether neighbouring countries (notably Angola, Botswana, South Africa, and Zambia) will make any new infrastructure or other investments to mirror those envisaged within Namibia." Comment: that is quite a key assumption, particularly in the case for the envisaged linkage for manganese export between SA's Northern Cape and Lüderitz</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. It is a key assumption, and a critical unknown in the prediction of impacts. But one that cannot be solved now.</p> |
| <p>Fig 3.13 Road and rail links within Southern Africa. Comment: just to clarify...is this the existing railway network or is this proposed/envisaged? Also, how much of that network is able to handle bulk industrial cargo (i.e. these really long trains that go at snail's pace 24/7) without interfering with existing railway traffic?</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Caption clarified. The figure does not distinguish between railway lines for bulk (e.g. Sishen-Saldanha iron ore trains). Namibia's railways are not equipped to handle that kind of bulk, and the Master Plan does not suggest bulk railway haulage in Namibia.</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|---------------------------------|-----------------------|--|
| <p>Sec 3.6.4 Aviation “Integrate domestic flights into Hosea Kutako operations (i.e. close Eros Airport), and don’t use the unprofitable airports (Rundu, Katima, Keetmanshoop and Lüderitz)”</p> <p>Comment: I can see that a code-sharing / open skies approach is unlikely to improve air traffic flow at Lüderitz. However, "not using" the Lüderitz airport by Air Namibia and NAC begs the question then whether it will continue to be maintained (and by who) to allow private air traffic to operate, including traffic related to the tourism, fishing, mining and oil industries.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>It is not proposed to shut down the unprofitable local airports in the Master Plan. This is corrected in SEA final report (Sec 3.6.4). The Master Plan suggests that NAC sheds its unprofitable airports (Lüderitz is one of them), but recognises that they could be retained for the social functions they serve with tax money not by cross subsidies of NAC and Air Namibia. With regard to code-sharing / open skies approach, this will open the aviation industry to the free market. The Master plan does not foresee which airline or which airport will serve in an economically viable way. It is out of the scope of the project.</p> |
| <p>Sec 3.8 “Development of the port of Lüderitz is included in the Master Plan, to address the demand to export manganese ore from the Northern Cape in RSA, zinc from the Rosh Pinah area, and fruits (mainly table grapes and dates) from the Orange River valley and southern Namibia”</p> <p>Question: Is there really a demand to export manganese ore from the Northern Cape? As far as I understand these mines have a largely dedicated railway system to export via Saldanha.</p> <p>Question: - would this require a new railway section on the South African side, from the manganese mine to somewhere where it can hook up with the Namibian network?</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>(Response by JICA Study Team) Demand base should be studied further, for the price of resource is quite volatile. At least their potential capacity exceeds the capacity of present Transnet transportation. Thorough EIA must be done at the stage of Feasibility Study and decide if it is good or not. There is an existing physical connection at least. Further technical details should be studied after the market assessment.</p> |
| <p>Sec 3.8.1 “Improvements to Lüderitz Port have been underway for many years, with improved facilities for cold storage and containers, and completion of the railway to Aus in 2014.”</p> <p>Comment: the completion of the railway between the Lüderitz railway station and Aus—the part between the railway station and the port actually has not been tackled yet and appears to be the responsibility of Namport. As such the railway line serves little purpose at this stage.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. But it does not affect the SEA.</p> |
| <p>Sec 4.1.1 Environmental situation of the corridors – 09 Keetmanshoop-Lüderitz</p> <p>Comment: not sure whether it is worth adding the "wild" horses just west of Aus that tend to congregate at Garub, and provide a popular tourist attraction (as well as a road hazard) between Aus and Lüderitz</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Revised report states:</p> <ul style="list-style-type: none"> • “Wild horses at Garub (close to Aus) provide a popular tourist attraction” |
| <p>Table 4.2 Key features of the major nodes. Lüderitz Land Use</p> <p>Comment: Essentially Lüderitz is surrounded only by the Tsau//Khaeb (Sperrgebiet) NP, with a coastal section of it extending north past Lüderitz.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Revised report states:</p> <ul style="list-style-type: none"> • Surrounded by the Tsau//Khaeb (Sperrgebiet) National Park |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|---------------------------------|-----------------------|--|
| <p>Table 4.2 Key features of the major nodes. Lüderitz Employment and local economy Comment: What about Namdeb? Although most Namdeb activities near Lüderitz are concentrated at Elizabeth Bay (and possibly elsewhere near there, e.g. Kolmanskop), many workers seem to commute and have their families in town. Plus there are associated security and office staffs that live and work in Lüderitz.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Revised report states:</p> <ul style="list-style-type: none"> Namdeb activities near Lüderitz are concentrated at Elizabeth Bay and Kolmanskop. Many workers commute and have their families in Lüderitz. Plus there is associated security and office staffs that live and work in Lüderitz. |
| <p>Table 4.2 Key features of the major nodes. Lüderitz Other Comment: should have a similar blurb to Swakopmund about being rich in architectural heritage from the German colonial era, both at Kolmanskop and in Lüderitz itself.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Revised report states: Rich in architectural heritage, with many buildings from the German colonial era both at Kolmanskop and in Lüderitz itself.</p> |
| <p>Table 4.2 Key features of the major nodes. Lüderitz Natural Environment Comment: There seems to be a bit of an imbalance on what is listed for Swakop/Walvis and for Lüderitz. If you mention Bird Island, you need to mention the Lüderitz Bay islands too; same for the Lüderitz wetland, which probably supports a similar number of Namibian Red Data species. And seeing that you mention the Walvis-Swakop IBA, you should perhaps then also make reference to Lüderitz being surrounded by the Sperrgebiet IBA and the Lüderitz Bay Islands IBA Comment: Not sure whether wind farms (and their potential as wildlife barriers) should be mentioned here? One is approved and is supposed to go ahead in the immediate future near Kolmanskop (to feed into the national grid) and another one is planned to specifically provide power for town.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. These points are added in Sec 4.2 Additional notes on the nodes - Lüderitz</p> <p>Agree. Revised report states: Two wind farms are proposed. One near Kolmanskop (to feed into the national grid) and another one is planned to specifically provide power for Lüderitz.</p> |
| <p>Sec 4.2.3 Lüderitz Infrastructure Comment: are you sure about the manganese concentrate? At the moment Rosh Pinah Zinc Corporation is transporting zinc and lead concentrate to Lüderitz, where it is stored in a shed in the harbour and then exported.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>(Response by JICA Study Team) Market assessment should be done first. At least some vacant warehouses are available in Lüderitz.</p> |
| <p>Sec 4.2.3 text above Figure 4.3 "The management zoning proposed for the Lüderitz Bay is shown in Figure 4.3" Comment: the Currie et al report was written before the MPA was actually proclaimed. Now that is is proclaimed (since 2009), the management zoning that was proposed in the report has been endorsed and is valid. This has been gazetted and regulations specific to the MPA have also been gazetted since then. To clarify that these ARE the zones (and not just proposed zones) you could chop off the headings above the map, especially since you explain the important colour coding in the legend anyway.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Revised report states: The management zoning for the Lüderitz Bay is shown in Figure 4.3. Legend above the map has been removed in the revised report.</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|---------------------------------|-----------------------|--|
| <p>Sec 4.2.3 Lüderitz Natural environment</p> <p>Comment: perhaps it is relevant to add the three overarching objectives of the NIMPA here, as per DRAFT management plan (let me know if you would like to see a copy). These are:</p> <ol style="list-style-type: none"> 1. Improve the conservation status of species of conservation significance 2. Preserve ecosystem health and function 3. Improve fisheries management. <p>The functions you have listed (and which are important in the context of this report) would fall under these objectives.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Inserted in revised report.</p> |
| <p>Sec 4.2.3 Lüderitz Natural environment</p> <p>Comment: add breeding requirements here - excessive disturbance will decrease breeding success and at worst cause displacement/abandonment of a site; this would be particularly relevant for the Halifax Island and Penguin/Seal Island birds, and possibly for cetaceans such as the Heaviside's Dolphin and the Southern Right Whale</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Revised report states: "Protection of the foraging and breeding requirements of various animals in the Benguela ecosystem, including a number of globally threatened seabirds and cetaceans such as Heaviside's Dolphin and the Southern Right Whale;"</p> |
| <p>Sec 4.2.3 Lüderitz Natural environment</p> <p>Comment: In Simmons et al 1998 (not sure how that differs from the Simmons et al 2001), the Lüderitz Bay Islands IBA doesn't include Flamingo Island. Simmons RE, Boix-Hinzen C, Barnes KN, Jarvis AM, Roberson A 1998. Important Bird Areas of Namibia. In: The Important Bird Areas of southern Africa. Barnes KN (ed.) pp. 295-332. BirdLife South Africa, Johannesburg.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Flamingo Island removed from text in revised report.</p> |
| <p>Sec 4.2.3 Lüderitz Natural environment Table 4.3</p> <p>Comment: Other bird species considered threatened in Namibia and found in the Lüderitz area include Greater and Lesser Flamingo (both VU in Namibia and both here for most of the year in various bays the wetland and the sewage outlet vlei, except when it's exceptionally wet inland), Black-necked Grebe (NT, flocks of up to 400 individuals close inshore between the harbour islands and Diaz Point), Eurasian Curlew (NT, small numbers at Second Lagoon and Radford Bay), Chestnut-banded Plover (NT, small numbers at Second Lagoon), Hartlaub's Gull (VU, resident breeder), Caspian Tern (VU, small numbers), Cape Gannet (CR, often seen foraging in Shearwater Bay in particular)</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. These additional species added to Table 4.3</p> |
| <p>Sec 4.2.3 Lüderitz Natural environment Table 4.3 Swift tern</p> <p>Comment: not threatened globally or in Namibia so should be taken off this list. 40% of population</p> <p>Comment: That seems a bit high; incidentally a colony of Swift Terns and Hartlaub's Gulls had been displaced from a breeding site when the current harbour was extended in the late 1990s, mainly because of harbour-related disturbance and the presence of fish factory and harbour-dwelling feral cats. Luckily they have low site fidelity and are happy to breed on Penguin, Seal and Halifax Islands (they seem to "shop around" and choose whatever island seems right when they are ready to breed)</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Swift Tern removed.</p> |
| <p>Sec 4.2.3 Lüderitz Natural environment Table 4.3 Crowned cormorant</p> <p>Comment: Near Threatened in Namibia</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Corrected in revised report .</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|---------------------------------|----------------|---|
| Sec 4.2.3 Lüderitz Natural environment Table 4.3 Cape cormorant Comment: Endangered globally and in Namibia Comment: up to ~3500 pairs (see for example Kemper et al 2007 estimates) | Email 29-01-2015 | Jessica Kemper | Agree. Corrected in revised report |
| Sec 4.2.3 Lüderitz Natural environment Table 4.3 African BI Oystercatcher Comment: Near Threatened in Namibia and globally | Email 29-01-2015 | Jessica Kemper | Agree. Corrected in revised report |
| Sec 4.2.3 Lüderitz Natural environment Table 4.3 Damara Tern Comment: Near Threatened globally and in Namibia | Email 29-01-2015 | Jessica Kemper | Agree. Corrected in revised report |
| Sec 4.2.3 Lüderitz Natural environment "Any additional threat, such as an oil spill disaster or disturbance to their breeding areas, could have a critical impact on the populations that are already severely depressed." Comment: particular those that are breeding residents in the area and surrounds, such as African Penguins, Cape Gannets, Bank Cormorants, and Cape Cormorants | Email 29-01-2015 | Jessica Kemper | Agree. Added to text in revised report |
| Sec 4.2.3 Lüderitz Natural environment Brown hyena Endangered Comment: According to IUCN it is currently listed as Near Threatened. I know that a new assessment has just been done which involved Ingrid Wiesel's input, but probably has not been published yet. Ingrid might be able to give you updated details. | Email 29-01-2015 | Jessica Kemper | Agree. Corrected in revised report. |
| Sec 4.2.3 Lüderitz Natural environment Brown hyena Reference Try Wiesel I 2006. Predatory and foraging behaviour of brown hyenas (<i>Parahyaena brunnea</i> (Thunberg, 1829)) at Cape fur seal (<i>Arctocephalus pusillus pusillus</i> Schreber, 1776) colonies. PhD thesis, University of Hamburg, Germany. It's downloadable from the web. See page 8 for a density map. Alternatively use the Roan News article in the latest issue which shows the use of the peninsula nicely | Email 29-01-2015 | Jessica Kemper | Agree. Corrected in revised report. |
| Sec 4.2.3 Lüderitz Natural environment Recreational fishing. Comment: ... including lobster fishing. This is one of the favourite pastimes of the locals, especially given that there is not much else to entertain yourself with in this town and our remoteness to any other towns, so it actually plays quite a big role in local social life. | Email 29-01-2015 | Jessica Kemper | Agree. Added to text in revised report. |
| Sec 5.2.3 Scoping–Ecological impact Comment: Compromising the structural and functional integrity of marine and/or terrestrial "hotspot of biodiversity" habitats. (not sure whether that is covered as such in point 5.2.5, but I feel it should be explicitly listed under "ecological impacts") | Email 29-01-2015 | Jessica Kemper | Agree. Added to text in revised report. |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|--|-----------------------|--|
| <p>Sec 6.1 Table 6.1 Lüderitz Bay "Key additional concerns are: • Additional habitat loss (endemic plants) • Disturbance to marine species (e.g. dolphins and seabirds)" Addition: loss of kelp beds and associated fauna, including rock lobsters, and foraging habitat for Crowned Cormorants and Bank Cormorants in particular (they tend to forage in the kelp beds)</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Added to text in revised report.</p> |
| <p>Sec 6.3.1 Table 6.4 Higher road traffic volumes... Comment: Just an aside; a significant number of brown hyenas are killed on the road between Lüderitz and Aus, especially at two particular spots. This prompted the erection of traffic signs warning about crossing hyenas - the only official brown hyena traffic signs in the world. Quantification has been difficult, as carcasses have been known to be removed for multi-purposes.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Useful addition. The following has been added to mitigations in the revised report: "- Erect signposts at places where there is a high frequency of animal crossings, such as the brown hyena signposts between Aus and Lüderitz, and elephant signposts on the Trans-Caprivi road." Table 6.15 includes the mitigation suggestion to erect signage for wildlife crossings.</p> |
| <p>Sec 6.3.1 Table 6.4 Increased road accidents ... truck drivers needing breaks The new draft (?) Structure Plan for Lüderitz includes provision for a truck stop</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Noted, and confirmed by JICA Study Team that there is no provision for a truck stop yet.</p> |
| <p>Chapter 6 Table 6.9 Impact of increased rail traffic. "Reduced disturbance to wildlife, livestock and vegetation" Comment: this might depend where the railway runs. Not having had a railway near Lüderitz for many years, it is difficult to judge its impacts on local wildlife, especially brown hyenas. However, a new railway system shuttling bulk industrial goods (and therefore presumably running constantly) between Angra Point and further inland is likely to pose a disturbance to brown hyenas and may change their movement routes. This is something you could bounce off Ingrid Wiesel</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Noted. Ingrid Wiesel commented by phone that the proposed railway line on the Peninsula will interfere with the daily movements of brown hyenas between their dens and foraging areas on the beaches.</p> |
| <p>Sec 6.5.1 Footprint "The terrestrial footprint of the proposed Angra Point Port is approximately 9 km², about one third of the total area of the Peninsula" Comment: not sure whether this is of relevance in this argument, but also note that the Peninsula is currently the only place where people can go outside of Lüderitz to relax and for recreation, as the town is surrounded from all sides by Namdeb security area. Taking away a third of this therefore limits local recreation venues and movement of locals (and tourists) even further. Also, the associated infrastructure (rail, road upgrade, power lines) will increase that footprint in terms of potential impacts on the local fauna and flora even further. Addition: inside a protected area, within the Tsau//Khaeb (Sperrgebiet) National Park</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. These points added to the revised report.</p> <p>Agree, added to revised report.</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|---|--|-----------------------|---|
| <p>Sec 6.5.5 Illegal plant collecting. "Some of the succulent plants found on the Peninsula are ... prone to illegal collecting. Development of the Angra Point port would make access onto the Peninsula easier and many more people would be moving around in the area, making this sort of illegal activity more likely" Comment: not sure if this is a valid argument. More than anything the new port area would already eradicate these succulents to a large extent, so illegal collecting inside the port would be minimal. Whether illegal plant collectors are more likely to score lifts out to the peninsula to search for and collect plants elsewhere on the peninsula, thanks to the increased (port-related) traffic is debatable. The peninsula is accessible to the public already and illegal plant collectors appear to have no problems getting out there (pers obs.).</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. This issue has been removed from the impacts section.</p> |
| <p>6.5.6 Urban congestion "There is no truck port included in the town plan but there are areas zoned for business where one could be built, with investor assistance". Comment: as mentioned earlier, the new Structure Plan is making provision for a truck port near the entrance of town (I have not seen the final draft, but had raised the issue in a public meeting and I was assured that this is planned)</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>The presence or absence of a truck stop at Lüderitz is not clear.</p> |
| <p>Table 6.15 increased risk of pollution Lüderitz and Walvis Bay "Pollution prevention plans and oil spill contingency plans must be in place, with appropriate equipment always ready". Addition: oil spill contingency plans regularly updated (especially contact lists) and port staff trained in using the equipment.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Extra conditions included in revised report for both towns.</p> |
| <p>6.6.4 Increased road kills "There is a surprising lack of data on this problem. Since it is foreseen to become a bigger problem in future, data collection should be started as soon as possible...." Comment: it would actually be really interesting and useful to have a roadkill atlas programme of sort that extends beyond the "Event Book" approach and would involve public participation. Similar to SABAP perhaps. It could reveal "roadkill hotspots" that could perhaps be mitigated in future.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. This suggestion has been added to the SEMP (5.3.1)</p> |
| <p>Table 7.1 Lüderitz harbour upgrade - Negative impacts "Dredging – suspension and dispersal of toxic substrate – affecting fish, birdlife, aquaculture" Addition: marine life (i.e. more than fish, e.g. lobster, kelp beds, local benthos etc.)</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Additional components included in revised report.</p> |
| <p>Table 7.1 Lüderitz harbour upgrade - Negative impacts "Loss of unique coastal habitat (many endemic species present)" Addition: inside a protected area (terrestrial) and MPA (marine); endemic and threatened species present</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Additional components included in revised report.</p> |
| <p>Table 7.1 Lüderitz harbour upgrade - Negative impacts "Increased traffic in urban areas (noise, inconvenience, pollution, accidents)" Addition: ... and on the Peninsula.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. Additional text included in revised report.</p> |

| Inputs | Meeting or correspondence, date | Persons | Responses |
|--|---------------------------------|-----------------------|---|
| <p>Table 7.1 Lüderitz harbour upgrade – Alternatives to Angra Point Deep Water Port - Establish new harbour in disturbed area in Diamond Area 1, south of Lüderitz “May be uneconomical as railway and other infrastructure will have to be built/established, and area is an exposed, high-energy coastline, which may provide engineering challenges”.</p> <p>Comment: it is unlikely that the one railway line between Aus and Lüderitz will be able to handle the envisaged activities at the Angra Point port. Therefore a new (additional) railway line would probably have to be built in any case through hilly / shifting sand dune terrain, which poses its own costly engineering challenges, albeit perhaps less challenging than via Uubvlei.</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Addition of a second railway line is not suggested or considered likely. The comment is irrelevant. Ignore.</p> |
| <p>Table 7.1 Lüderitz harbour upgrade – Alternatives to Angra Point Deep Water Port “A comprehensive EIA will be needed as part of the planning of the new port, and consideration of site alternatives should be the most important component of the EIA”</p> <p>Comment: there would first have to be an EIA for rezoning the area from protected to industrial, and only then an EIA for the port as such</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Agree. This text is inserted in the revised report: Any rezoning of land from Protected to Industrial land use would first have to be assessed, and only if that was approved, then an EIA for the port would need to be done.</p> |
| <p>Table 7.1 New railway line through East Kavango and Zambezi</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>A new railway line is not suggested in the Master Plan. This component is not considered, so the comments are irrelevant. Ignore.</p> |
| <p>References. “Elwen S. 2014. Heaviside’s Dolphin in Lüderitz. Roan News.” Comment: that’s Golaski et al in Roan News</p> | <p>Email 29-01-2015</p> | <p>Jessica Kemper</p> | <p>Reference corrected in revised report.</p> |

13.3 Strategic Environmental Management Plan

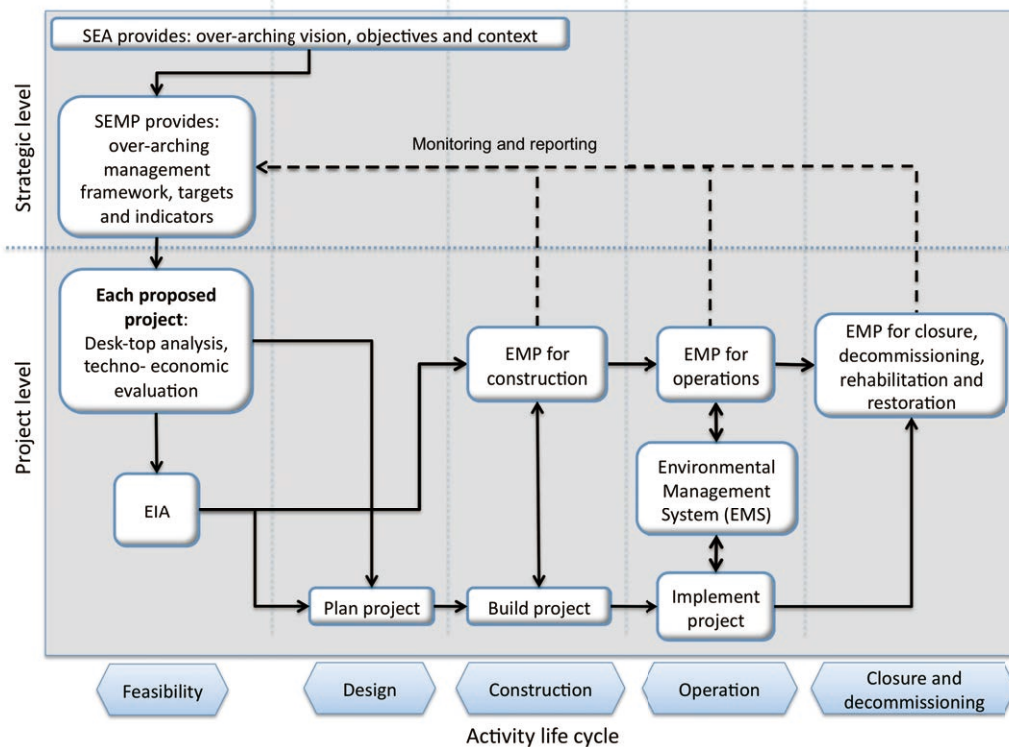
13.3.1 Introduction

Since SEA is driven by the concept of sustainability, the logical consequence of an SEA should be guidance on how sustainability principles can be mainstreamed throughout the life cycle of activities and projects. This guidance is provided through the Strategic Environmental Management Plan (SEMP).

The main goal of this SEMP is to guide decision makers on how best to realise the benefits of the proposed Master Plan whilst also minimising the key negative risks. The aim is to develop win-win situations where multiple, mutually reinforcing gains can strengthen the economic base, provide equitable conditions for all, and protect and enhance the environment. Where this is impossible, the trade-offs must be clearly documented to guide decision-makers.

The SEMP provides an over-arching framework for addressing the direct, indirect and cumulative impacts of projects and activities linked to the implementation of the Logistics Hub Master Plan. A key manner in which this is achieved is by setting Environmental¹⁴ Quality Objectives (EQOs) that need to be met by the individual projects, and through all of them collectively, the Master Plan as a whole. The SEMP does not remove the obligation for a project-specific Environmental Impact Assessment (EIA) and abiding by a site-specific Environmental Management Plan (EMP) (Figure 13.2). On the contrary, all projects listed in the Environmental Management Act (EMA) of 2007, must undergo an EIA (though some may be “mini EIAs”) prior to authorization and implementation. Moreover, each project will have a number of permit obligations that must be met for the developer to be legally compliant.

¹⁴ Environment is broadly defined to include socio-economic, biophysical and other elements.



Source: Modified from Department of Environmental Affairs and Tourism, RSA, 2002

Figure 13.2: Planning hierarchy from strategic to project levels

In order to present a SEMP that is useful for guiding development along a sustainable pathway, the SEA initially developed a good understanding of the scope of the Logistics Hub Master Plan, the need for upgrading infrastructure (e.g. roads and rail) and the need for other resources (e.g. water, land, labour). In this way, it was possible to understand the impacts likely to result from the implementation of the Master Plan.

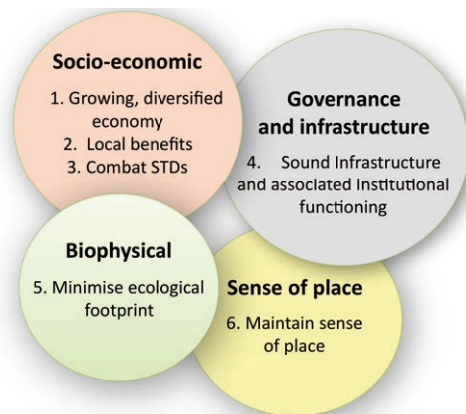
An understanding of the development and the vulnerability of the receiving environment has led to the identification of the responses needed at strategic levels – particularly from high level decision makers, be they government, parastatal, local authority or corporate. They are primarily responsible for ensuring that environmental issues are appropriately addressed, and that an enabling environment is created for sustained growth and development. Also, developers are responsible for implementing best practice, whether defined by local legislation or industry norms. Best practice means doing more than the bare minimum.

Developing the EQOs contained in this SEMP required a combination of public and expert opinion, and an examination of policy, ethical and legal requirements. The six EQOs each articulate an overall goal and include twenty key outcomes that need to be monitored. These collectively make up the SEMP, which is the framework within which individual projects need to be planned and implemented and within which a number of institutions need to undertake certain actions. If the required

investments are made (e.g. physical and social infrastructure), institutions are strengthened and partnerships are forged, governance is improved and individual projects are well planned and implemented, there is a good chance that the Logistics Hub Master Plan will contribute significantly to the goal of sustainable development of Namibia. This is the desired outcome.

13.3.2 Vision, EQOs and indicators

An EQO is typically a non-enforceable goal, which specifies a target for environmental quality which, it is hoped, will be met. In some cases, EQOs are a vague form of generally desirable objectives, but in other cases, they might be concrete quantitative measures. Wherever possible, they should be acceptable to all key stakeholders, quantifiable, verifiable and outcomes oriented. Implicit within all EQOs is a minimum management objective that any changes to the environment must be within acceptable limits and that pro-active intervention will be triggered by the responsible party to avoid unwanted changes that breach a specified threshold. Whilst many of the EQOs are interrelated and thus difficult to compartmentalize, they are arranged under broad themes (Figure 13.3).



Source: SAIEA

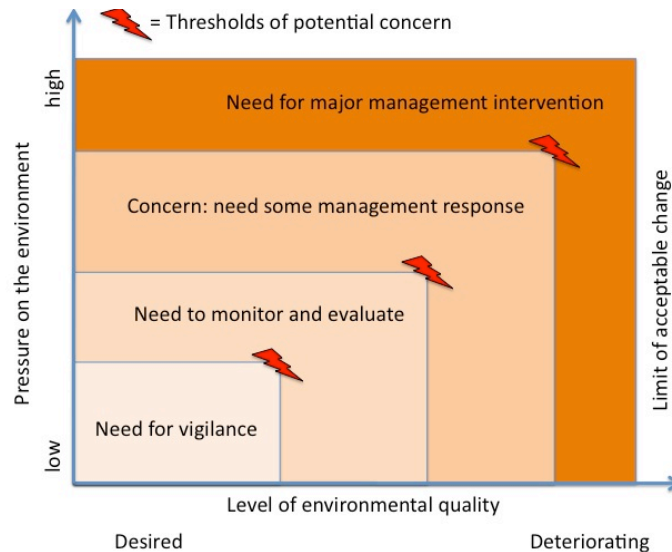
Figure 13.3: The 6 EQOs clustered within broad themes

13.3.3 Management, monitoring and reporting

The best way for Namibia to properly implement the Master Plan is for decision makers at all levels to enter into meaningful partnerships with each other, so that the country can utilize all available skills. However, it is recommended that Government (through the NPC) take overall responsibility for implementing the SEMP, with a close partnership fostered between the most pertinent GRN agencies, parastatals, Local Authorities and the private sector.

The implementation of the SEMP needs to be overseen by at least one full-time staff member, who could sub-contract and manage all the monitoring, communication and reporting. The office must then collate the data and compile the annual SEMP report. Data for many of the indicators are already being collected by various institutions for various purposes, but some effort will be required in order to collect additional data.

Monitoring and auditing of the implementation of the Master Plan is required to assess whether the sustainability criteria are being met and the guidelines are being adhered to. A monitoring and auditing programme should be developed for this purpose. The sustainability indicators, formulated as part of the SEA, are tools that can be used for monitoring the extent to which the sustainability criteria are being met. Monitoring and auditing guides the adjustment of the plan and projects, as well as the extent to which enabling investments are being made and institutions are functioning adequately (Figure 13.4).



Source: adapted from Binedel and Brownlie, 2007¹⁵

Figure 13.4: Using a precautionary approach to managing strategic impacts in relation to the limits of acceptable change

The information obtained through monitoring and auditing is required for completion of an annual SEMP report and refinement of the EQOs, their indicators and data gathering methods. It is important that procedural arrangements are established and maintained to ensure that the monitoring system runs effectively and that data from year to year are replicable, comparable and auditable. Also, it should be noted that monitoring does not end with the collection of environmental information but includes their evaluation, interpretation, reporting and recommendations for corrective action. Information received through monitoring can be of assistance when considering appropriate remedial action by the relevant stakeholders.

Thus, the SEMP office, with assistance from its many partners, must produce an annual SEMP report that provides a clear indication of what targets are being exceeded, met or not met, as the case may be. The recommended structure for the SEMP report is as follows:

- Title and period: e.g.
 - Logistics Hub Master Plan SEMP Report, 2015

¹⁵ Binedell ML, Brownlie S. 2007. Limits of acceptable change: how much is too much? In: Govender K, Adouin M (eds.). Enhancing the Effectiveness of SEA in South Africa, p.55-74.

- Compiled by (Name) and date completed
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 - Citation (e.g. Logistics Hub Master Plan SEMP Report, 2015. Published by the Government of the Republic of Namibia, National Planning Commission, Windhoek)
 - Disclaimers (if any)
 - Place where copies of the report may be obtained (e.g. GRN website)
- Executive Summary (less than 5 pages, includes key findings, conclusions and recommendations)
- Acknowledgements
 - Co-authors
 - Data gatherers and data providers
 - Sponsors
- EQOs and indicators (keep this succinct – preferably < one page per indicator)
 - Name of EQO
 - Description of indicators and performance targets
 - Status of performance: Exceeded/met/not met/unsure
 - Assessment: Narrative report on status of performance – include tables/graphs that illustrate the most important trends. Key questions are:
 - What are the root causing for good/poor performance?
 - Are there lessons to be learnt?
 - Is there a need for modifying the indicator?
 - Do we need to improve/change monitoring methods?
 - Data source: List who provided the data, and the locality of the data (for future reference). The data do not need to be in the SEMP report – they could be bound into a separate report.
 - Public consultation and input:
 - List the extent to which communications or submissions was received from the public. Space permitting, letters/faxes/emails or SMSs can be attached, or at least referenced.
 - List dates, venues, agendas and minutes of meetings held (if any).

13.3.4 Environmental Quality Objectives

Since the EQOs are a synthesis of the content and analysis provided in the main SEA report, the reader is referred to the main SEA report for more detailed background information.

Also, it should be noted that a complete list of references, a glossary and a list of acronyms appears in the main SEA report. None of these have been replicated in this SEMP.

13.3.4.1. EQO 1: A growing, diversified Namibian economy

Aim of this EQO

The Logistics Hub Master Plan must improve Namibia’s sustainable socio-economic development and outlook without undermining the growth potential of other sectors or desirable land use practices.

Background

If poorly planned and managed, major infrastructure projects could negatively impact various natural resources (e.g. land, water, biodiversity) and thus undermine other economic sectors such as tourism and agriculture. Namibia cannot afford to promote one sector to the extent that it presents opportunity costs on other important socio-economic activities.

Performance and monitoring indicators

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|--|--|---|---|
| 1. Significant increase in cargo transported through Namibia | Namibia’s share of total potential transit cargo volume to landlocked areas of SADC increases from 12% (2013) to 20% (2025) | NPC and MWTC are “champions”, with TransNamib, WB Corridor Group and haulage contractors as key partners | WB Corridor Group |
| | Proportion of transport and storage to GDP increases from 2,5% to 4,6% by 2025 | As above | As above |
| 2. Projects consider multiple sector needs | <ul style="list-style-type: none"> All listed projects¹⁶ have an EIA and EMP prior to final design and implementation, and in all cases, opportunity costs are considered After construction, impacted areas are rehabilitated in such a way that other land use is possible. | <ul style="list-style-type: none"> Contractors, but this requirement must be specified in tender documents MET ensure correct application of Environmental Management Act (EMA) For major projects, MET to conduct inspections at appropriate intervals. | <ul style="list-style-type: none"> EMA (2007) compliance register EIAs and Records of Decision (RoDs) Contractors provide information– and MET to verify |

Policy, legal or other tools available for achieving this EQO

Environmental Management Act, 2007

Guidelines and references

None identified.

¹⁶ Listed means the activity is required to have an EIA under the Environmental Management Act of 2007.

13.3.4.2. EQO 2: Local benefits

Aim of this EQO

Promote local employment and socio-economic benefits.

Background

Social trends cannot be predicted with any great degree of accuracy. However, it is obvious that large infrastructure projects will impact on the lives of people, and these impacts must be carefully managed to achieve positive gains and avoid conflict. Since it is inconceivable that all the new construction and maintenance jobs will go to locals, it is certain that some areas will experience significant in-migration and that various socio-economic impacts will result. Many of these will be positive (e.g. employment, new skills), but some will also be negative (e.g. increased competition for jobs, housing and services, increased crime, spread of STDs, etc.). Given that Namibians have a Constitutional right to live and work anywhere in the country, preventing within-country migration is neither possible nor desirable. However, it may be necessary to consider measures that limit the extent to which opportunities are captured by foreigners at the expense of locals. Given that this SEA is attempting to seek ways of maximizing the positive impacts of the Master Plan for Namibia, protecting local livelihoods and promoting opportunities for locals, should be a policy objective.

Performance and monitoring indicators

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|---|--|--|---|
| 1. GRN income is optimised | <ul style="list-style-type: none"> Corporate taxes are paid in full by transport parastatals, private companies, industrial parks and associated companies EPZ status only granted in accordance with existing policies and laws | <ul style="list-style-type: none"> Parastatals and companies must pay taxes, and other fees as specified by law. Ministry of Finance, Ministry of Trade and Industry | <ul style="list-style-type: none"> GRN budget documents Parastatal and company annual reports |
| 2. Economic opportunities optimised | <ul style="list-style-type: none"> Majority (preferably over 75%) of all sub-contractors are Namibian registered companies Majority (preferably over 75%) of all employees are Namibian citizens or permanent residents Increasingly, inputs are sourced locally rather than imported | Contractors, but this requirement must be specified in tender documents | <ul style="list-style-type: none"> MWTC Contracting companies |
| 3. Where local skills are unavailable, training programmes improve skills | <ul style="list-style-type: none"> Every major project has a skills development programme for employees All employees and contractors undergo regular training so that lost time incidents are within industry norms | Contractors, but this requirement must be specified in tender documents | <ul style="list-style-type: none"> MWTC Contracting companies |

Policy, legal or other tools available for achieving this EQO

Project-specific EIAs and EMPs, tender documents, contract agreements, Labour Act

Guidelines and references

Not identified.

13.3.4.3. EQO 3: Combat STDs

Aim of this EQO

Mainstreaming HIV and AIDS into the environmental assessment and Master Plan implementation process, so that project-specific EMPs incorporate measures to avoid, reduce, minimise or control the transmission of HIV.

Background

Eastern and southern Africa is more heavily affected by HIV and AIDS than any other region of the world, with some 22.5 million people living with HIV. Although the region has only 5.4% of the world's population, it has 48.3% of global HIV infections. 60% of the world's women infected with HIV live in this region. Despite recent achievements including expansion in access to treatment and prevention of mother to child transmission, the epidemic is still one of the key threats to attaining the over-arching objective of sustainable and equitable economic growth and socio-economic development in the region.

The impact on households, institutions, society and the economy is reflected in the rising cost of health care, changes in the population structure, and increased dependency ratios. Like Namibia, all the countries in the region aspire to greater economic development and many see this as a way to reduce poverty and increase government revenues and social spending. Ironically, however, many types of development projects inadvertently increase the risk of HIV transmission. The linkages between increased HIV prevalence around large-scale projects such as the construction of infrastructure (roads, pipelines, transmission lines, dams, etc.) are well documented and are due to the presence of mostly male migrant workers. The combination of mobility, loneliness, money, alcohol and a high-risk work environment often results in men having unprotected sex with local sex workers. It has also been established that increased trade, especially along road routes, through ports and at border crossings can increase the incidence of HIV in these areas.

The spread of HIV along transportation routes (roads and railways) is well-documented and so this component of the project needs special attention.

Performance and monitoring indicators

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|-----------------------------------|---|---|-------------|
| 1. "Hotspots" become "safe-spots" | <ul style="list-style-type: none"> Every truck stop has adequate appropriate facilities to entertain truck drivers and reduce their need for unsafe sexual interactions The Logistics Hub Master Plan has a specific awareness programme aimed at reducing the risk of unsafe sex | Contractors, but this requirement must be specified in tender documents | MWT |
| 2. Efficient border crossings | Lobby governments to improve border crossing procedures for trucks to minimise delays; | Ministry of Home Affairs and Immigration (MHA) | MHA |

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|---|--|---|-------------|
| 3. Workers and affected communities are not more vulnerable to HIV because of the project | <ul style="list-style-type: none"> • Project managers, supervising consultants and contractors should all receive adequate training and technical support to design and monitor HIV components. • Conduct regular health/disease surveillance in construction camps. • Voluntary testing and counselling of workers • Improve HIV awareness & promote behaviour change based on agreed targets and key performance indicators. • Provide free antiretrovirals and condoms to staff during project construction operation • Recruit locally wherever possible. • Prevent job seekers flocking to the project site or local villages. Strategies include: <ul style="list-style-type: none"> • Do not hire casual labourers 'at the gate'; • Hire through established employment agencies; • Conduct job interviews at nearby towns, not on site; • Provide information about employment policies and procedures; • Work with local government and police to prevent squatter camps at site gate/nearby villages. | Contractors, but this requirement must be specified in tender documents | WBCG |
| 4. Transport staff are not more vulnerable to HIV because of the project | <ul style="list-style-type: none"> • Lobby transport companies to adopt and implement in-house HIV programmes and policies; • Work with transport companies to ensure that their drivers receive adequate HIV training; • Develop tailored behaviour change communication (BCC) materials such as mirror hanger messages and bumper stickers; • Include condoms in the road safety kit; • Target main transportation hubs e.g. loading/offloading points, transporter rest stops, passenger transport terminals, etc. with HIV awareness campaigns. | WBCG | WBCG |

Policy, legal or other tools available for achieving this EQO

Article 10 of the Constitution of the Republic of Namibia (1990) states that all persons shall be equal before the law and that no persons may be discriminated against on the grounds of sex, race, colour, ethnic origin, religion, creed or social or economic status. Article 5 ensures that the fundamental rights and freedoms enshrined in the Constitution shall be respected and upheld by the Executive, Legislature and Judiciary and all organs of the Government and its agencies.

Labour Act, No 11 of 2007 and the regulations on health and safety of employees published under s.101 of the old Labour Act, 1992, which remain in force. In Notice No. 78 of 18 March 1998 the Namibian Ministry of Labour and Social Welfare promulgated Guidelines for Implementation of the National Code on HIV and AIDS in Employment.

Guidelines and references

- UNDP (2012). Guidelines for Integrating HIV and Gender-related Issues into Environmental Assessment in East and Southern Africa. Prepared for UNDP by the Southern African Institute for Environmental Assessment. UNDP, Pretoria, South Africa

13.3.4.4. EQO 4: Sound infrastructure and associated institutional functioning

Aim of this EQO

This is one of the primary motivating factors for the Logistics Hub Master Plan, and the plan itself provides great detail in this regard. There is no point in repeating text that is available elsewhere, so in this EQO, only the most pertinent points are covered. The aim of this EQO (and as noted earlier, the Logistics Hub Master Plan) is to ensure that key infrastructure in selected nodes and corridors are in place and well maintained, thus enabling economic development, improved public convenience and enhanced safety. However, good infrastructure alone is not enough: institutions that are responsible for managing the infrastructure and trans border movement must provide effective governance through good leadership, oversight and facilitation, so that all legal requirements are met by all parties involved, whilst at the same time, efficient travel is achieved.

Background

The roads in and through Namibia are essential for mining, trade (local and regional), tourism, agriculture and socio-economic development generally. The road network is of reasonably good quality but the safety of many corridors has been compromised by increased traffic, more heavy vehicles than before and inadequate maintenance.

Considering the anticipated escalating traffic as a result of the implementation of the Logistics Hub Master Plan, the upgrading and proper maintenance of the main tarred road network is essential. Similarly, substantial new investments are needed to bring Namibia's railways up to standard, so that a far greater percentage of goods can be transported by rail than is currently the case. Also, the existing harbours are earmarked for major renovations.

Performance and monitoring indicators

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|--|---|--|---|
| 1. Roads are in good condition | <ul style="list-style-type: none"> All key road corridors are maintained timeously to avoid deterioration, and upgraded as required. Road markings and signage are in place and in good condition | Roads Authority | Roads Authority Independent survey report |
| 2. Most bulk goods are transported by rail | >14% of all bulk goods passing through Namibia, are transported by rail by 2025 | Industries, in collaboration with MWTC and TransNamib | <ul style="list-style-type: none"> TransNamib Namport Mining companies |
| 3. Walvis Bay and Lüderitz harbours are efficient and safe | <ul style="list-style-type: none"> Average loading/ offloading rate for containers is similar to/faster than at Durban or Cape Town ports Average waiting time for ships to obtain a berth is similar to/shorter than at Durban or Cape Town ports | Namport | Namport |
| 4. Border control points are upgraded | <ul style="list-style-type: none"> Adequate processing facilities, parking and public amenities, are established (and maintained) at the relevant border crossings Adequate staff are assigned to such crossings to ensure efficient processing and | <ul style="list-style-type: none"> Ministry of Home Affairs and Immigration Ministry of Finance (Customs & Excise) | MHAI |

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|-----------------|---|------------------------------------|-------------|
| | traffic movement <ul style="list-style-type: none"> Average waiting times for industrial traffic are similar to / shorter than at other major border posts in southern Africa. | | |

Policy, legal or other tools available for achieving this EQO

- The Roads Master Plan (2003) contains the entire medium to long term strategies for managing all public roads in Namibia. It gives guidelines for managing the maintenance and upgrading of public roads. This Roads Master Plan is due for review and updating.
- Namibian Ports Authority, Ports Regulation, 2001, Government Gazette No. 2549

Guidelines and references

- Procedure Manuals of the Ministry of Works, Transport and Communication, Department of Transport (1993)

13.3.4.5. EQO 5: Minimise ecological footprint

Aim of this EQO

The ecological integrity and diversity of fauna and flora of Namibia is not compromised by the implementation of the Master Plan. Integrity in this case means that ecological processes are maintained, key habitats are protected, rare and endangered and endemic species are not threatened. All efforts are taken to avoid impacts to the natural environment and where this is not possible, disturbed areas are rehabilitated and restored to function after construction activities.

Background

Namibia has a great variety of habitats with high levels of endemism and numerous advanced adaptations to arid conditions. The country has two globally significant “biodiversity hotspots”; namely the Sperrgebiet and Namib Desert. In many parts of the country, the rate at which development is taking place is outpacing the implementation of environmental, social, and health and safety safeguards necessary to ensure sustainable and responsible development.

Performance and monitoring indicators

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|--|--|--|---|
| 1. Construction avoids impacts to biodiversity and ecosystems through careful site selection, and where impacts are unavoidable, mitigation, restoration and offsetting form part of the EMP | <ul style="list-style-type: none"> Greenfield projects in protected areas are avoided wherever possible Infrastructure corridors are carefully planned to avoid important biodiversity areas - demonstrate consideration of alternatives, commitment to the ‘green route’ Footprints of projects are minimized and every project has a biodiversity | <ul style="list-style-type: none"> Contractors, but this requirement must be specified in tender documents MET ensure correct application of Environmental Management Act For major projects, MET | <ul style="list-style-type: none"> EMA (2007) compliance register EIAs and RoDs Contractors provide information– and MET to verify |

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|---|---|---|---|
| | rehabilitation and restoration programme | to conduct inspections at appropriate intervals. | |
| 2. Important ecological processes must not be compromised | <ul style="list-style-type: none"> • Surface hydrology and groundwater movement are not impeded and linear oases are protected • Wildlife movements are not disrupted • To minimize erosion, soil surface is not degraded by construction activities outside delineated footprint areas. | As above | As above |
| 3. Projects do not threaten integrity of aquifers and their associated biodiversity | <ul style="list-style-type: none"> • Groundwater used for construction only if aquifer known to be able to supply adequate water without undermining the aquifers integrity | As above | As above |
| 4. Species extinctions must constitute a FATAL FLAW. If infrastructure placement will likely result in a species extinction, no infrastructure planning permission will be granted. | <ul style="list-style-type: none"> • All EIAs must consider extinction possibility, and resources must be available for reasonable investigation. • GRN refuses project authorization if extinction likely | <ul style="list-style-type: none"> • Projects (that commission and fund EIAs) • MET approves/ denies project implementation | As above |
| 5. No secondary impacts occur | <ul style="list-style-type: none"> • Off-road driving, poaching, illegal camping, littering by construction personnel, are explicitly disallowed in contract documents • Effective vigilance and visibility of law enforcement personnel, with structured support from civil society | <ul style="list-style-type: none"> • Contractors, but this requirement must be specified in tender documents • MET ensure correct application of Environmental Management Act • For major projects, MET to conduct inspections at appropriate intervals. | MET, Namibian Police Force (NAMPOL), Conservancies, Farmers Associations, Local Authorities |

Policy, legal or other tools available for achieving this EQO

- Article 95(1) of the Namibian Constitution states that the Government must adopt policies for the maintenance of ecosystems, essential ecological processes and the biological diversity of the country, as well as the utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future.
- Environmental Management Act, 2007
- Marine Resources Act 2000
- Draft Wetlands Policy 2004
- Draft Pollution Control and Waste Management Act
- Water Resources Management Act 2004, currently under revision and not yet commenced

Namibia is signatory to the UN Convention on Biological Diversity (CBD). Namibia is therefore obliged to conserve biodiversity and regulate the sustainable use of its natural resources. It is also obliged to develop and adopt national biodiversity strategies, plans or programmes and integrate biodiversity conservation and sustainable use into relevant sectoral or cross-sectoral plans, programmes and policies.

Namibia is also signatory to:

- Ramsar Convention on Wetlands of International Importance (1971)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973, CITES)
- Convention on the Conservation of Migratory Species of Wild Animals (1979),
- International Treaty on Plant Genetic Resources for Food and Agriculture (2001)

Guidelines and references

Not identified

13.3.4.6. EQO 6: Maintain sense of place

Aim of this EQO

To ensure that the natural and architectural beauty of the nodes and corridors, and their sense of place, are not compromised unduly by the implementation of the Logistics Hub Master Plan.

Background

The concept of ‘sense of place’ is relative and highly subjective. To some people a specific place or town is unattractive, but to others it is the place where they choose to live or visit, and they may resist actions that cause its character to deteriorate.

For example, Swakopmund is labelled ‘beautiful with character, laid back and inviting’. New buildings must be ‘consistent’ with the ambience of the town so that sense of place is maintained or enhanced. By contrast, Walvis Bay is an industrial town, since it has developed around the port and fishing industry. This implies that people are somewhat more tolerant of ‘ugly’ structures such as stacks, cranes, bulk-fuel reservoirs, coal heaps, shunting yards, etc. Lüderitz is an example of a town that is both touristy and characterful, whilst also being industrial. In other towns, such as Usakos, Karibib, Grootfontein, Katima Mulilo and Oshikango, sense of place is somewhat less defined or nurtured, as they struggle to maintain any form of identity. These towns are neglected, under-developed, poorly resourced and desperate for almost any kind of investment.

Similarly, Namibia’s rural landscape is defined by low levels of habitation, natural bush, and wildlife. Namibia is branded and successfully marketed as “land of open spaces” and the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities that must be regarded as valuable natural assets.

The Logistics Hub Master Plan may change the character of some towns, but mostly it will probably not. Walvis Bay and perhaps Lüderitz will continue to grow as industrial hubs, with port expansion, increased heavy traffic, and housing extensions, inevitable. Also, the volume of traffic on all corridor roads will increase, with escalating road accidents experienced.

Performance and monitoring indicators

| Desired outcome | Activities and performance indicators | Party responsible for implementing | Data source |
|---|--|---|--|
| 1. Hub projects are planned and developed in an orderly fashion | <ul style="list-style-type: none"> • Zoning restrictions are adhered to, thus avoiding inappropriate and conflicting land use and development • Planning safeguards and due process are applied to avoid undue fast-tracking and circumvention | Municipalities – enforced by NAMPAB and MRLGHRD | <ul style="list-style-type: none"> • Town planning scheme • Municipality • Minutes of municipality Council meetings • EIA reports and RoDs |
| 2. Rural landscapes (e.g. Namib and Zambezi) remain visually attractive | <ul style="list-style-type: none"> • Project developers must minimize negative visual impacts. EIAs required prior to final design and outcomes-based EMPs must guide project planning and implementation. In all cases, visual impacts are assessed by a specialist • New roads, rail and other infrastructure should be kept as close to existing roads and other visual disturbances as possible. • No billboards are erected beyond a 5km radius of proclaimed towns. | | <ul style="list-style-type: none"> • EIA report and visual impact specialist study • EMP report • Decommissioning and restoration plan, with funds • The proponent. The DEA must keep a copy of all EIA reports and specialist studies |

Policy, legal or other tools available for achieving this EQO

- Namibian Constitution
- Environmental Management Act, 2007

Guidelines and references

- Namibia Vision 2030: Policy Framework for Long term Development. © Government of the Republic of Namibia 2004
- Guidelines for Landscape and Visual Impact Assessment. 2002. U.K Institute of Environmental Management and Assessment (IEMA). Spon Press
- Oberholzer, B. 2005. Guideline for involving visual and aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town. http://www.capecgateway.gov.za/eng/publications/guidelines_manuals_and_instructions/G/103381.