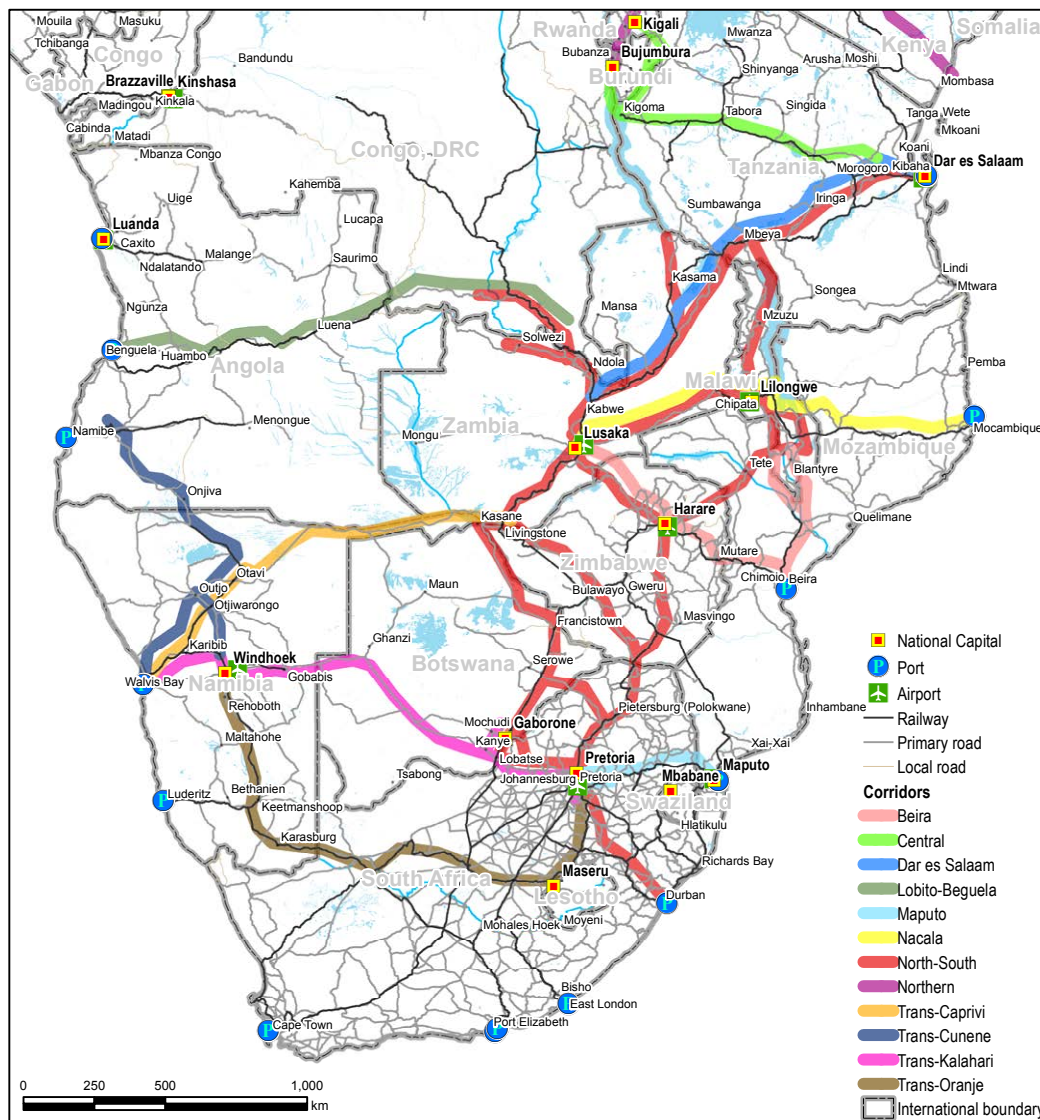


4. Logistics Network in SADC and Namibia

4.1 Regional cargo flows in SADC

4.1.1 Logistics network in SADC

Figure 4.1 shows an overall picture of the current logistics network in SADC, including ports, airports, railways and corridors (trunk roads). Business people look at the picture when they need to provide logistics services in SADC and consider which route fits their needs in terms of cost, time, security, and additional services and functions.



Source: Tripartite Corridors eGIS "SADC Transport Corridors - Roads, Ports and Border Posts"

Figure 4.1: Current Network of Ports, Airports, Railways and Roads in SADC

There are different “natural” positions among major gateway ports mainly according to their locations and size of economies of their immediate hinterland.

A current main gateway to SADC is Durban Port that has the largest hinterland in South Africa, and the port is connected with the inland countries via the North-South Corridor. Walvis Bay Port is the gateway to the Atlantic Ocean and is connected with the inland countries via the Trans–Caprivi, Trans–Kalahari Corridors and so on. The gateway to the Indian and Pacific Oceans is Dar es Salaam Port that is connected with the inland countries via the Dar es Salaam Corridor.

4.1.2 Cargo volume of SADC countries

4.1.2.1 Total cargo volume

The cargo volume of SADC which is the sum of import and export¹ is estimated 420.5 million tons in 2010 (refer to Table 4.1). Among them, South Africa accounted for 59% (248.0 million tons), and other countries with ports accounted for 32% (135.5 million tons), and inland countries represented 9% (37.0 million tons), respectively.

Table 4.1: Trade volume of SADC countries in 2010

Unit: million tons

Countries	Export	Import	Total (export and import)	Share in total (%)
Angola	95.0	10.0	105.0	25.0%
Botswana*	2.0	5.0	7.0	1.7%
DRC	3.0	4.0	7.0	1.7%
Lesotho*	0.0	0.0	0.0	0.0%
Malawi*	1.0	2.0	3.0	0.7%
Mozambique	4.0	6.0	10.0	2.4%
Namibia	3.0	5.5	8.5	2.0%
South Africa	190.0	58.0	248.0	59.0%
Swaziland*	1.5	1.5	3.0	0.7%
Tanzania	3.0	9.0	12.0	2.9%
Zambia*	4.0	4.0	8.0	1.9%
Zimbabwe*	3.0	6.0	9.0	2.1%
Total	309.5	111.0	420.5	100.0%
Countries with seaports excluding South Africa	105.0	34.5	135.5	32.2%
Countries without seaports	11.5	18.5	37.0	8.8%

Note: * countries which don't have seaports; Angola's export includes crude oil (95 million ton).

Source: Compiled by JICA Study Team based on the graph of "2012 Journal of Transport and Supply Chain Management" (pp 202-203)

4.1.2.2 Seaborne cargo

In SADC countries, a very large share of international trade with the world is transported by sea. The total trade volume of SADC Countries by all modes was 420.5 millions tons in 2010. Of this, the total volume of seaborne cargo amounts to 388.2 million tons in 2010 (refer to Table 4.2).

¹ Island countries such as the Republic of Mauritius and the Republic of Seychelles are not included in this analysis.

Table 4.2: Estimated seaborne cargo volume by countries

Unit: tons

Country	2010		2011		2012		2013	
	Volume	Share	Volume	Share	Volume	Share	Volume	Share
Namibia	5,248,981	2%	5,530,767	2%	6,522,205	-	6,505,928	-
South Africa	248,787,484	85%	264,469,818	85%	268,652,855	-	-	-
Mozambique	14,078,500	5%	19,435,200	6%	-	-	-	-
Tanzania	10,993,080	4%	12,084,000	4%	13,713,389	-	-	-
Angola	14,071,985	5%	10,599,296	3%	11610484	-	11,823,704	-
Total	293,180,030	100%	312,119,081	100%	-	-	-	-
Angola's Crude Oil	95,000,000	-	-	-	-	-	-	-
Grand Total	388,180,030	-	-	-	-	-	-	-

Note: Container cargo volume of South Africa was converted from TEU basis to weight basis by using a 13.5ton/TEU conversion factor. The conversion factor is calculated from data from Durban Port (<http://www.ports.co.za/durban-harbour.php>). The volume of Angola's crude oil was converted from barrels basis to weight basis by using a conversion factor of 1.928 million barrels/day into tons/year.

Source: Namport (Namibia); Summary of cargo handled at ports of South Africa January-December 2012, national port authority of South Africa expressed in TEU in January-December 2012 (Transnet, South Africa); Relatorio-e-Contas 2011 (CFM, Mozambique); Tanzania Port Authority Annual Statistical Report for 2012-13(TPA, Tanzania); Boletim estatístico anual 2013(CNC, Angola); EIA data (Angola's crude oil)

4.1.2.3 Airborne cargo

The total air cargo volume handled in southern Africa was 0.5 million tons, and 52% of the total air cargo was handled at OR Tambo Airport in 2009 (refer to Table 4.3). Therefore, forwarders' warehouses are accumulated around OR Tambo Airport. Both air cargo and seaborne cargo from Durban Port is collected, consolidated and transhipped to the inland countries in these warehouses. Table 4.4 indicates major logistics companies which handle Air Cargo.

Table 4.3: Air transport freight in 2009

Unit: ton

Countries	Air cargo volume (A)	Share	Major airport	Air cargo volume (B)	Share (B/A)
Angola	53,339	11%	Luanda	53,339	100%
Botswana		0%			
Congo, Dem. Rep.	88,183	18%	Kinshasa	67,544	77%
Lesotho		0%			
Malawi	4,303	1%	Lilongwe	4,303	100%
Mozambique	10,462	2%	Maputo	7,373	70%
Namibia	7,315	2%	Hosea Kutako	6,362	87%
South Africa	266,989	55%	OR Tambo	252,063	94%
Swaziland		0%			
Tanzania	25,868	5%	Julius Nyerere	18,844	73%
Zambia	4,756	1%	Lusaka	4,756	100%
Zimbabwe	20,155	4%	Harare	20,155	100%
Total	481,370	100%	Total	434,739	90%

Source: World Airport Traffic Report, ACI, 2009

Table 4.4: Major logistics companies handling air cargo

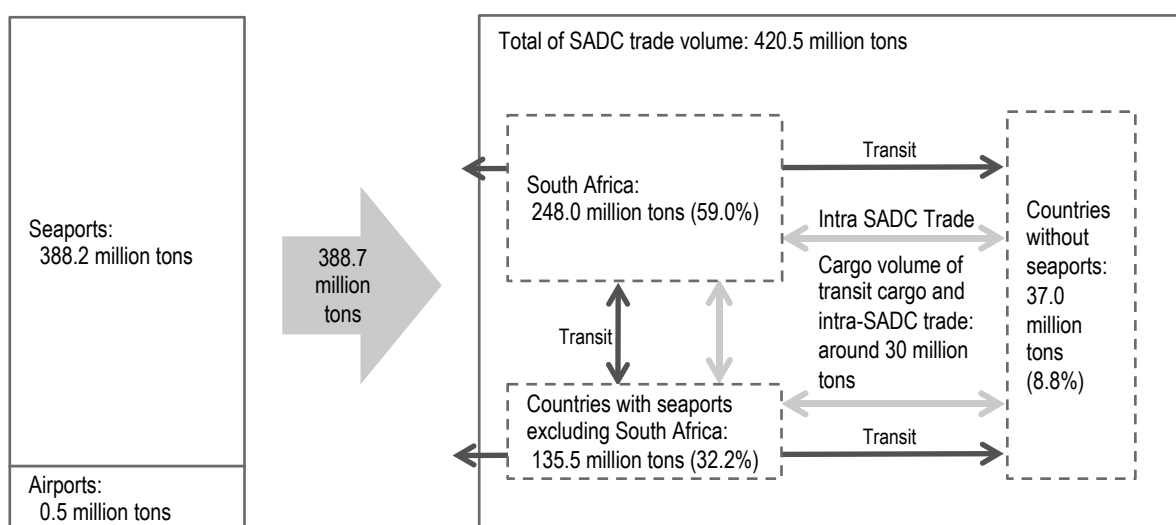
	Name of companies
1	Air Menzies International SA (Pty) Ltd
2	DHL Global Forwarding SA
3	DHL International Pty Ltd
4	Kuehne & Nagel (Pty) Ltd.
5	Lonrho Logistics Pty Ltd
6	Morgan Air Cargo Pty Ltd
7	Safcor Freight (Pty) Ltd
8	Schenker South Africa (Pty) Ltd
9	Skyservices (Pty) Ltd
10	UTi South Africa (Pty) Ltd

Source: Interviews with logistics companies

4.1.2.4 Total trade volume and cargo handling volume

The total trade volume of SADC countries amounts to 420.5 million tons of which more than 90 % of international cargo is handled by the seaports. Therefore, intra-SADC trade can explain the difference between the seaborne cargo volume and the total trade volume. The intra-SADC trade volume was 31.2 million tons in 2010.

The trade volume of intra-SADC is also calculated from trade volume of inland countries (37 million tons) minus transit trade volume. The transit trade volume from gateway ports to the inland countries is examined and the trade volume of intra-SADC is estimated in section 4.1.3.



Source: JICA Study Team

Figure 4.2: Total trade volume and cargo handling volume in SADC countries

Interviewees of logistics companies mentioned that the cargo landed at Durban and OR Tambo Airport are often shipped to the landlocked areas of SADC after custom clearance. Photographs in the next page were taken at a warehouse near OR Tambo Airport. Mining equipment which had cleared the customs process at City Deep in Johannesburg or OR Tambo Airport is transported to this warehouse and sorted by countries or mining sites².

This means that not all the cargo is transported to the inland countries as bonded cargo but also a certain volume of cargos (maybe a large portion of cargo) is transported to the inland countries as intra- SADC trade. Therefore, it is important to estimate volumes of transit cargo and intra-SADC trade.

² It means that the warehouse is not a bonded warehouse but a “normal” warehouse.

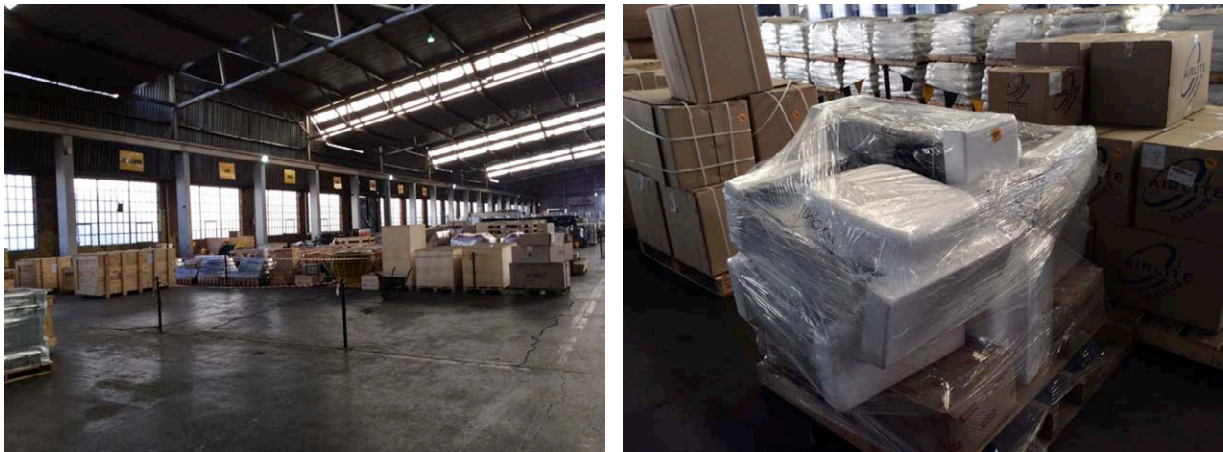


Photo: Equipment for mining re-exported to inland countries

4.1.3 Cargo volume and cargo flow in the gateway ports

4.1.3.1 Total cargo volume

Table 4.5 shows handling volumes of cargo and containers at major ports in SADC. The most important gateway for southern Africa is Durban Port, and Dar es Salaam, Maputo and Beira are gateways for East Africa. Walvis Bay Port is the gateway for West Africa. Luanda Port mainly handles domestic cargo.

Table 4.5: Cargo volume at ports

Countries and years	Port	Cargo volume (000 tons)	Share in each country	Container volume (000 TEUs)	Share in each country
Namibia in 2012/13	Walvis Bay	6,134	94%	302	99%
	Lüderiz	372	6%	3	1%
	Total	6,506	100%	305	100%
South Africa in 2012	Richards Bay	90,295	34%	4	0%
	Durban	77,900	29%	2,587	60%
	East London	2,478	1%	52	1%
	Ngqura	7,572	3%	561	13%
	Port Elizabeth	11,212	4%	252	6%
	Mossel Bay	2,294	1%	0	0
	Cape Town	15,627	6%	853	20%
	Saldanha	61,274	23%	0	0%
	Total	268,653	100%	4,309	100%
Mozambique in 2011	Maputo	11,739	60%	123	32%
	Beira	5,704	29%	160	41%
	Nacala	1,629	8%	90	23%
	Other	363	2%	18	5%
	Total	19,435	100%	392	100%
Tanzania in 2012/13	Dar es Salaam	12,531	91%	553	96%
	Tanga	458	3%	10	2%
	Mtwara	204	1%	15	3%
	Kilwa, Lindi and Mafia	49	0%	-	-
	Mwanza	361	3%	-	-
	Kigoma	82	1%	-	-
	Kyela	30	0%	-	-

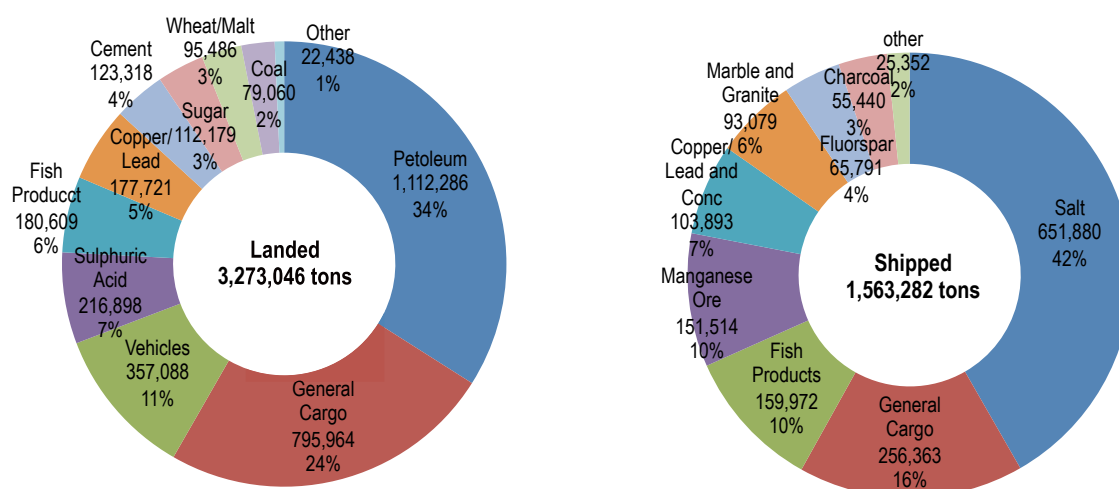
Countries and years	Port	Cargo volume (000 tons)	Share in each country	Container volume (000 TEUs)	Share in each country
	Total	13,713	100%	578	100%
Angola in 2013	Luanda	8,715	74%	408	80%
	Lobito	1,803	15%	61	12%
	Namibe	736	6%	22	4%
	Other	570	5%	42	8%
	Total	11,824	100%	512	100%
Cargo volume by countries	Namibia	6,506	2%	305	5%
	RSA	268,653	84%	4,309	71%
	Mozambique	19,435	6%	392	6%
	Tanzania	13,713	4%	578	9%
	Angola	11,824	4%	512	8%
Grand Total		320,131	100%	6,096	100%

Source: Namport (Namibia); Summary of cargo handled at port of South Africa January-December 2012, national port authority of South Africa expressed in TEU in January-December 2012 (Transnet, South Africa); Relatorio-e-Contas 2011 (CFM, Mozambique); Tanzania Port Authority Annual Statistical Report for 2012-13(TPA, Tanzania); Boletim estatístico anual 2013(CNC, Angola)

4.1.3.2 Cargo volume and transit cargo flow

Walvis Bay Port

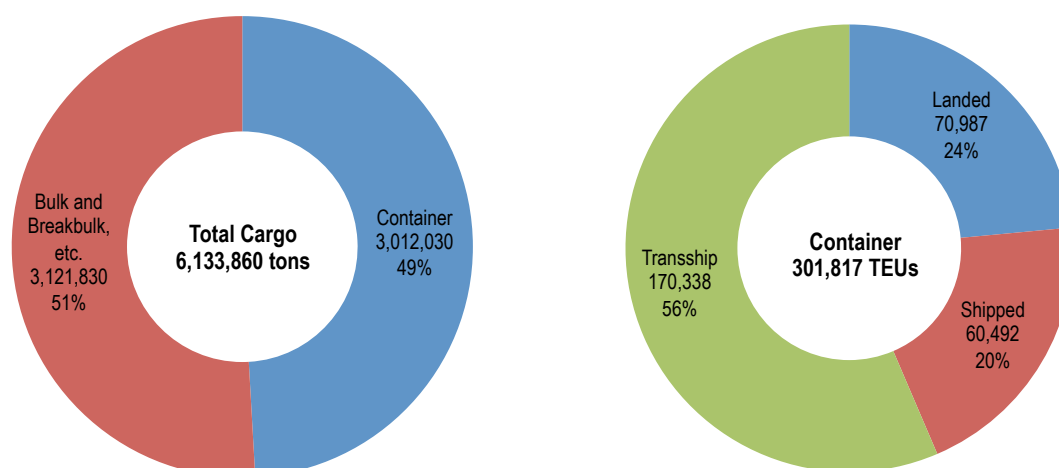
Walvis Bay Port is the major gateway to West Africa, Zambia and DRC. As of 2012/13, the volume of landed cargo was 3.2 million tons, and the volume of shipped cargo was 1.6 million tons and transshipment cargo was 1.3 million tons, respectively. Total handling volume was 6.1 million tons. Major landed cargo was petroleum, general cargo, vehicles and sulphuric acid. Major shipped cargo was salt, general cargo, fish products and manganese ore.



Note: Transshipment volume was 1,298,000 tons in 2012/13.
Source: Namport data

Figure 4.3: Major commodities handled at Walvis Bay Port in 2012/13

As shown in Figure 4.4, 49% of the total cargo was containers in 2012/13. Out of 302,000 TEUs (3 million tons) of container cargo, 56% represented transit cargo. Percentages of landed containers and shipped containers are 24% and 20% respectively.



Source: Namport

Figure 4.4: Breakdown of handling cargos at Walvis Bay Port

Table 4.6 shows the destination and origin of transit cargo. The total transit cargo volume was around 720,000 tons in 2012/13, of which Angola's share was 37% (280,000 tons), Zambia's share was 29% (207,000 tons), Zimbabwe's share was 18% (139,000 tons) and DRC's share was 8% (57,000 tons), respectively.

Table 4.6: Destination and origin of transit cargo

Unit: 000 tons

	To destination			From origin			Total			
	Containers	Break bulk	Total	Containers	Break bulk	Total	Containers	Break bulk	Total	Share (%)
Angola	265.8	1.6	267.4	0.5	0	0.5	266.3	1.6	267.9	37%
Botswana	3.8	28.1	31.8	0	0	0	3.8	28.1	31.8	4%
DRC	49.7	3.3	53	3.5	0	3.5	53.2	3.3	56.5	8%
Congo	1.1	0.4	1.4	0	0	0	1.1	0.4	1.5	0%
Malawi	0	3.2	3.2	2.3	0	2.3	2.3	3.2	5.5	1%
Mozambique	0	0.2	0.2	0	0	0	0	0.2	0.2	0%
South Africa	1.3	0.9	2.3	6.4	1.6	8	7.7	2.5	10.3	1%
Zambia	87.5	67.9	155.4	51.9	0	51.9	139.4	67.9	207.3	29%
Zimbabwe	10.1	128.6	138.7	0	0	0	10.1	128.6	138.7	19%
Total	419.3	234.2	653.4	64.6	1.7	66.3	483.9	235.8	719.8	100%

Note: Number of total transit container (full and empty) is assumed to be two times of full container.

Conversion factor $13.4\text{ton/TEU} = (\text{total container weight} 3012 - \text{transshipment container weight} 1255.6) / (\text{number of total container} 301.8 - \text{number of transshipment container} 170.3)$

Source: Transit data (number of full container), transshipment and total are based on Namport data.

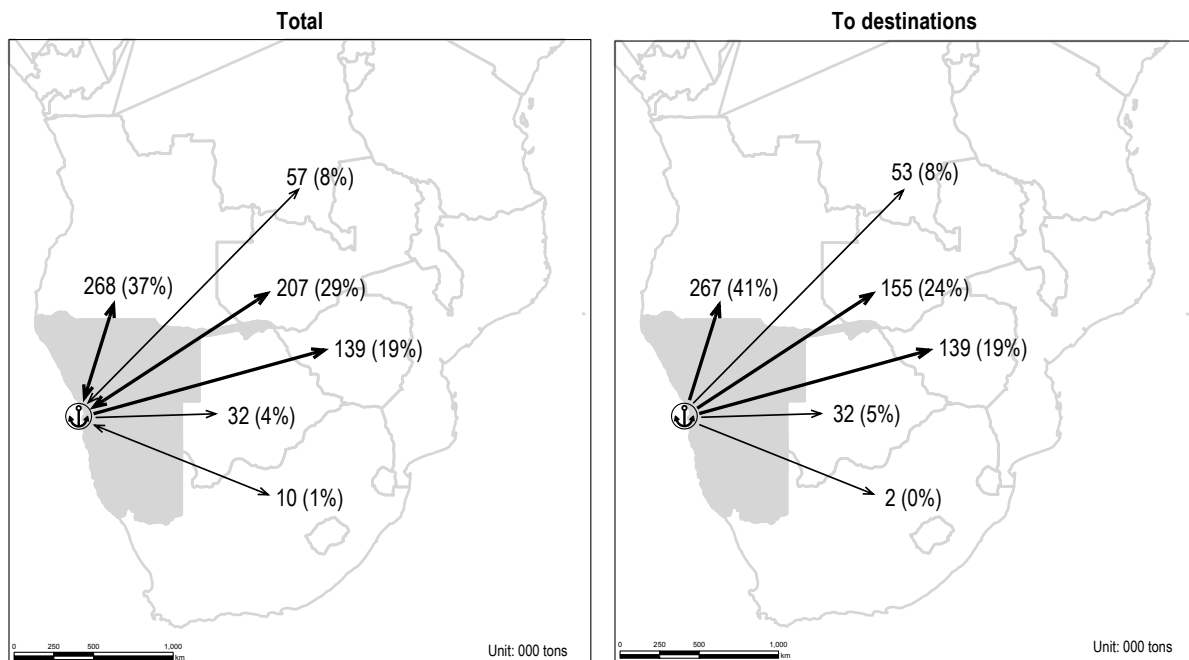
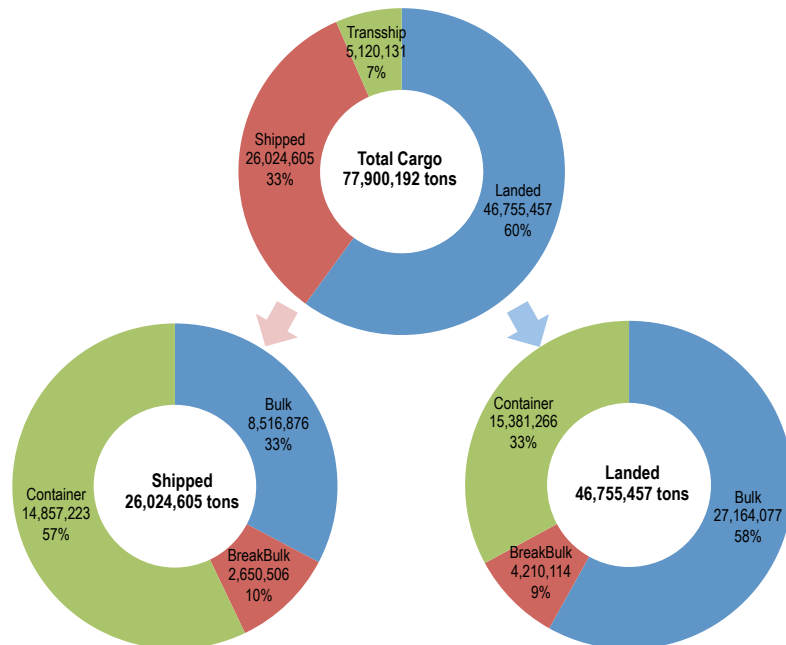


Figure 4.5: Destination and origin of transit cargo

Durban Port

Total cargo handling volume at Durban Port was 77.9 million tons in 2012 of which landed cargo was 46.8 million tons, shipped cargo was 26.0 million tons and transshipment cargo was 5.1 million tons respectively (refer to Figure 4.6).



Note: Container cargo volume of South Africa was converted from TEU to tons using 13.5 tons/TEU (based on statistical data at Durban Port; <http://www.ports.co.za/durban-harbour.php>).

Source: Transnet website

Figure 4.6: Main Cargo Handling at Durban Port in 2012

According to a report titled “9th Annual State of Logistics Survey for South Africa” (2013, Council for Scientific and Industrial Research; CSIR), it is estimated that 48% of cargo imported to SADC countries though South Africa is transported by road from Durban Port, while 52% is transported by coastal ships. The report also estimates that approximately 60% of cargo by volume is destined for Zambia, the DRC and Angola, while 40% is destined for Zimbabwe, Mozambique and Malawi. The JICA Study Team estimated that it can further be divided as 30% for Zambia, 26% for Zimbabwe, 20% for DRC, 12% for Mozambique, 7% for Angola, 4% for Malawi and 1% for Tanzania, respectively.

As indicated in Table 4.7, the cargo volume of transshipment and transit is not divided into transit import (to SADC countries) and transit export (from SADC countries). Therefore, the study team estimated from proportions of import and export to the sum of import and export. For example, transit import of bulk cargo accounts for $436 \times 31,374 / (31,374 + 11,167) = 321$ (000 tons).

The report doesn't mention such information on exported cargo from SADC countries through South Africa. Therefore, the study team assumes that transit export cargo is almost the same as the import in this analysis. Table 4.8 shows estimated cargo volume of transshipment and transit, and Table 4.9 and Figure 4.7 show estimated of transit cargo volumes (both of destination and origin).

Table 4.7: Estimated cargo volume

Kinds of cargo		Container volume (000 TEUs)		Cargo volume (000 tons)
Bulk cargo	Import			31,012
	Coastwise			362
	Subtotal			31,374
	Export			9,458
	Coastwise			1,710
	Subtotal			11,167
	Transshipment and Transit			436
Container cargo	Landed	Deep sea	1,133	15,302
		Coastwise	6	79
		Transshipment and Transit	173	2,340
		Subtotal	1,313	17,721
	Shipped	Deep sea	1,081	14,595
		Coastwise	19	262
		Transshipment and Transit	174	2,345
		Subtotal	1,274	17,202
Total	Import			46,755
	Export			26,025
	Transshipment and transit			5,120
	Total			77,900

Note: Conversion factor is set as 13.5ton/TEU based on the data of "http://www.ports.co.za"

Source: Cargo volume is based on Port Statistics (Transnet Website). "Figure Imported Cargo Flow from Durban" is based on "State of Logistics Survey for South Africa 2012"

Table 4.8: Estimated volume of transshipment and transit cargos

			000 tons	Note
Import (to SADC countries)	Transshipment	Bulk	321	52% of import
		Container	1,171	
	Transit		1,378	48% of import
Export (from SADC countries)	Transshipment	Bulk	114	52% of export
		Container	1,171	
	Transit		1,187	48% of export
Total	Transshipment		2,777	
	Transit		2,565	
	Total		5,342	

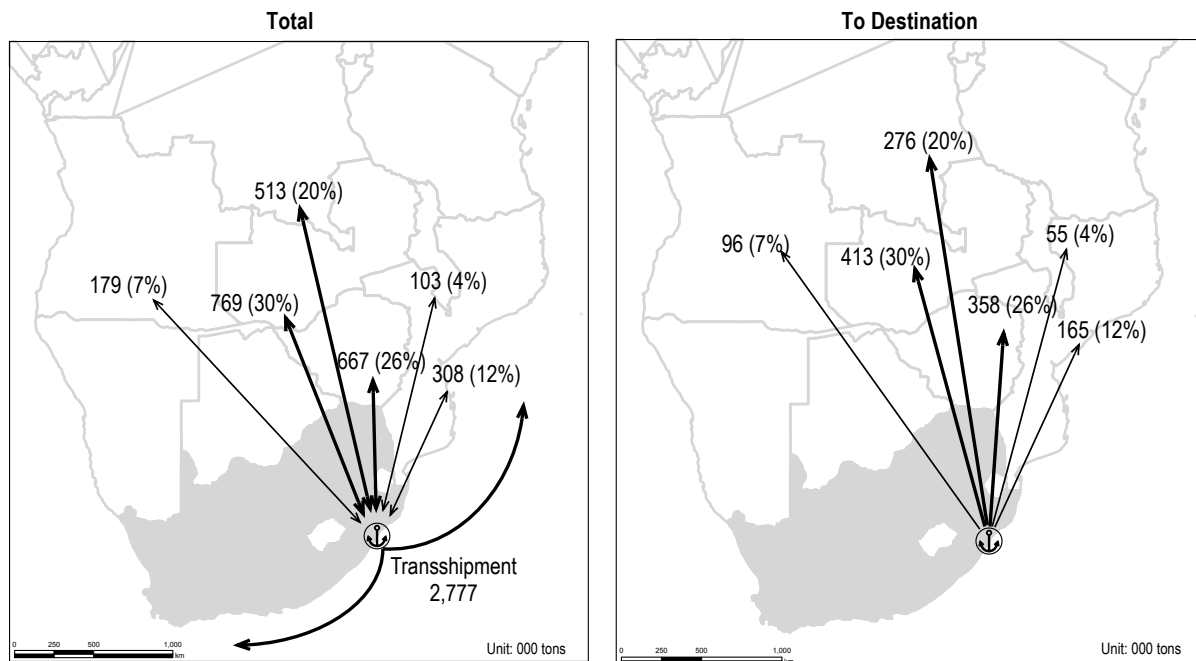
Source: JICA Study Team

Table 4.9: Destination and origin of transit cargo

Unit: 000 tons

	Destination	Origin	Total	Share
Zambia	413	356	769	30%
Zimbabwe	358	309	667	26%
DRC	276	237	513	20%
Mozambique	165	142	308	12%
Angola	96	83	179	7%
Malawi	55	47	103	4%
Tanzania	14	12	26	1%
Total	1,378	1,187	2,564	100%

Source: JICA Study Team



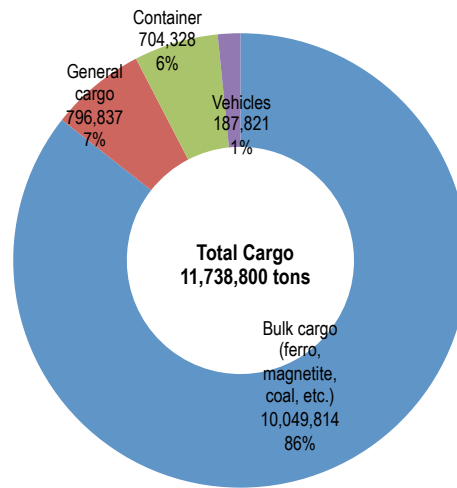
Source: JICA Study Team

Figure 4.7: Destination and origin of transit cargo

Maputo Port

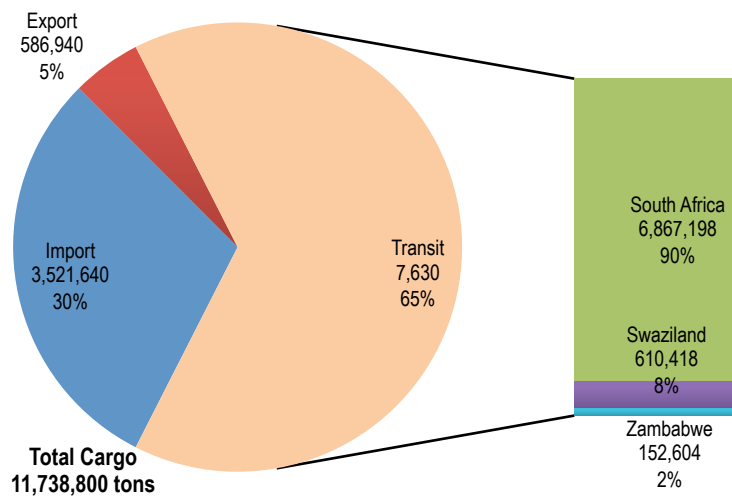
Cargo handled at Maputo Port amounted to 11.7 million tons in 2011, and 86% of which was bulk cargo such as iron ore, magnetite, coal and so on (Figure 4.8). According to “Maputo-Mozambique's biggest port (MPDC)”, the proportion of transit export was 65% of all cargo transport, and its major

destinations were South Africa (90%), Swaziland (8%) and Zimbabwe (2%) as indicated in Figure 4.9. The transit cargo handled at Maputo Port was 7.6 million tons, and 6.9 million tons of the transit cargo came from South Africa (refer to Table 4.10 and Figure 4.10).



Source: Relatório-e-Contas 2011 (CFM) p.3, Maputo-Mozambique's biggest port (MPDC) pp.11, 12 and 16.

Figure 4.8: Kinds of cargo handled at Maputo Port in 2011



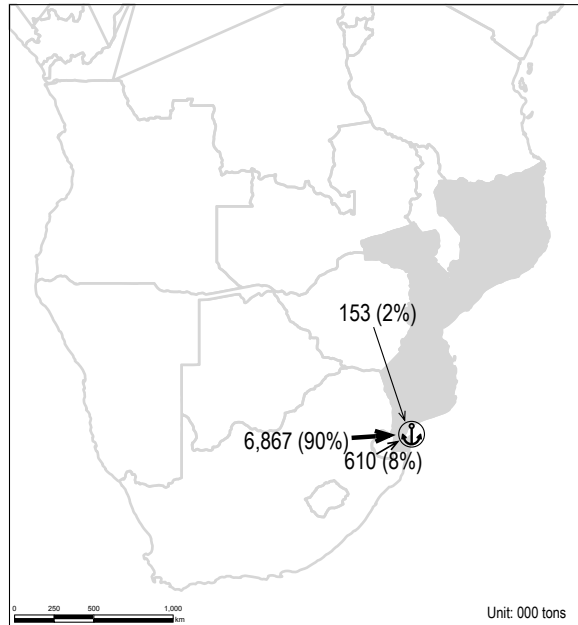
Note: Cargo volume by commodity is estimated based on the ratio of "Maputo-Mozambique's biggest port (MPDC) pp.11-12"
 Source: Relatório-e-Contas-2011 (CFM) p.3, Maputo-Mozambique's biggest port (MPDC) pp.11, 12 and 16.

Figure 4.9: Proportion of transit cargo and its major market at Maputo Port in 2011

Table 4.10: Origin of transit cargo

		Weight (000 tons)	Share
Origin	Transit	7,630	100%
	South Africa	6,867	90%
	Swaziland	610	8%
	Zimbabwe	153	2%

Source: JICA Study Team, based on "Maputo-Mozambique's biggest port (MPDC) p.16"

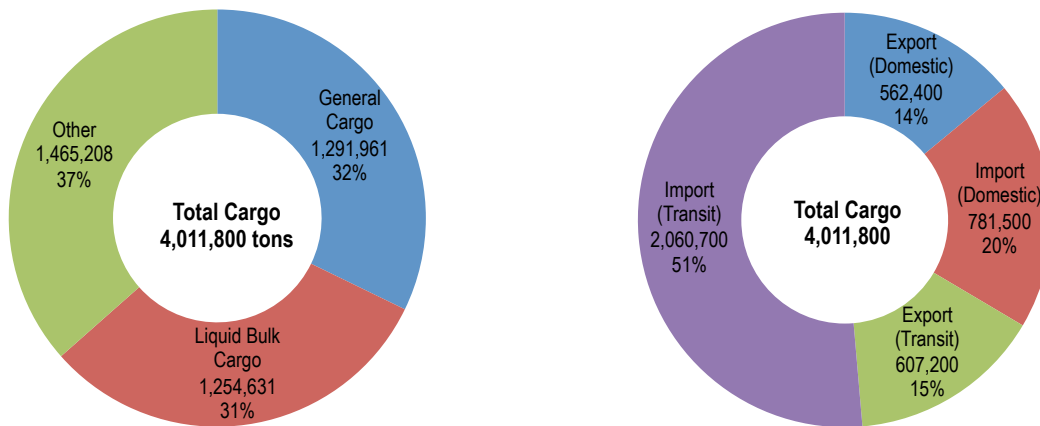


Source: JICA Study Team

Figure 4.10: Origin of transit cargo

Beira Port

Cargo handled at Beira Port amounted to 4.0 million tons in 2010. Of this 32% was general cargo, 31% was liquid bulk cargo and 37% was other cargo respectively (Figure 4.11). Almost all of the liquid bulk cargo was transported to Zimbabwe through the Beira-Feruka Oil Pipeline.



Source: Logistics Review of the Beira and Nacala Corridors (USAID, 2012)

Figure 4.11: Kinds of cargo handled at Beira Port in 2010

According to a report titled “Logistics Review of the Beira and Nacala Corridors” which was prepared by USAID in 2012, the transit cargo represented 66% of the total cargo volume. The report also confirmed that 68% (1.8 million tons) of the transit cargo is for Zimbabwe, 25% (0.7 million tons) is for Malawi, 8%(0.2 million tons) is for Zambia, and the rest is for DRC. Out of 1.8 million tons of transit cargo to Zimbabwe, 1.3 million tons of Liquid bulk cargo was transported through the

Beira-Feruka Oil Pipeline.

Table 4.11: Destination and origin of transit cargo in 2010

Country	Kind of flow	Container volume (000 TEUs)	Cargo weight		Total (000 tons)	Share
			Container (000 tons)	General (000 tons)		
Transit	Export	24	265	121	386	-
	Import	30	333	694	1027	-
	Subtotal	54	598	815	1413	-
Zimbabwe	Export	8	92	113	205	53%
	Import	11	116	231	347	34%
	Subtotal	19	208	344	552	39%
Malawi	Export	13	146	1	147	38%
	Import	14	149	361	510	50%
	Subtotal	27	295	362	657	46%
Zambia	Export	2	26	7	33	9%
	Import	6	67	102	169	16%
	Subtotal	9	94	109	202	14%
DRC	Export	0	0	0	0	0%
	Import	0	1	1	2	0%
	Subtotal	0	1	1	2	0%



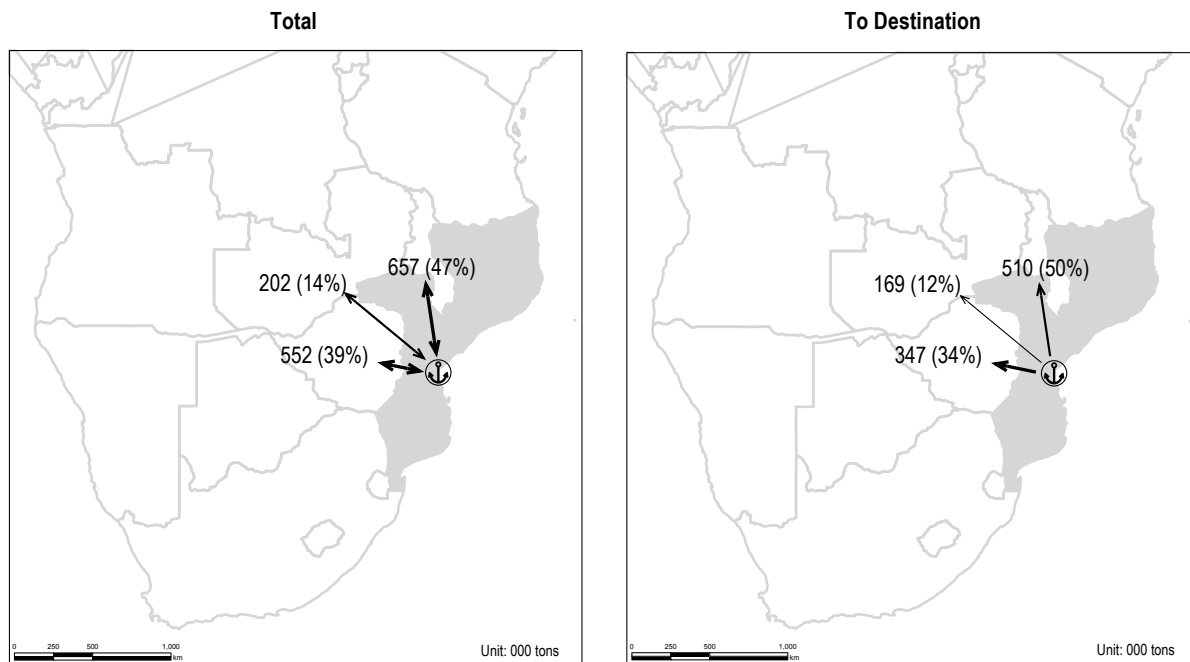
Note: Conversion factor 11.0 ton/TEU is calculated from transit container weight (598,000 tons) divided by number of transit container (54,412TEUs).

Source: Logistics Review of the Beira and Nacala Corridors (USAID, 2012)

Table 4.12: Container cargo weight in 2010

	Weight (000 tons)	Note
Transit total (A)	2,668	Logistics Review of the Beira and Nacala Corridors (USAID, 2012)
General cargo (B)	815	Logistics Review of the Beira and Nacala Corridors (USAID, 2012)
Liquid Bulk (C)	1,255	Liquid bulk is assumed to be shipped to Zimbabwe by the pipeline
Container (D)	598	D=A-B-C

Source: JICA Study Team



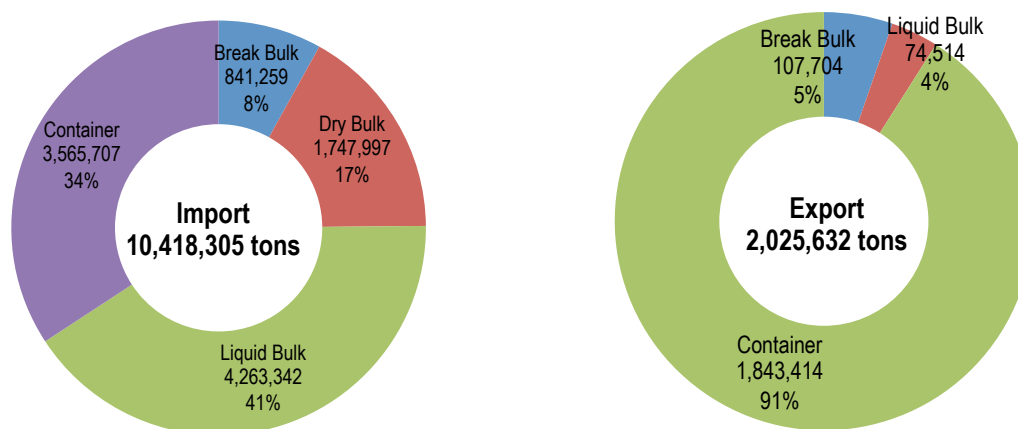
Source: JICA Study Team

Figure 4.12: Destination and origin of transit cargo

Dar es Salaam Port

Cargo handled at Dar es Salaam Port amounted to 12.5 million tons in 2012/13. Of this import cargo was 10.4 million tons, export cargo was 2.0 million tons and transshipment cargo was 87,000 tons, respectively. Major import cargo was liquid bulk and container cargo, and 91% of export cargo was container cargo (refer to Figure 4.13).

Regarding Transit cargo which amounts to 4.1 million tons in 2012/13, 45% of the transit cargo was for Zambia, 23% was for DRC, 15% was for Rwanda, 7% was for Burundi, 5% was for Uganda, and the rest was for Malawi etc. 550,000 Tons of petroleum was transported to Zambia via the TAZAMA pipeline. The pipeline originally had the capacity to transport 1.1 million tons of petroleum but the current rate of operation is around 50% due to the ageing of the facility.



Note: Transshipment cargo (87,000 tons) is not included.

Source: Tanzania Port Authority Annual Statistical Report for 2012-13 (TPA)

Figure 4.13: Major commodities handled at Dar es Salaam Port in 2012/13

Table 4.13: Destination and origin of transit cargo in 2012/13

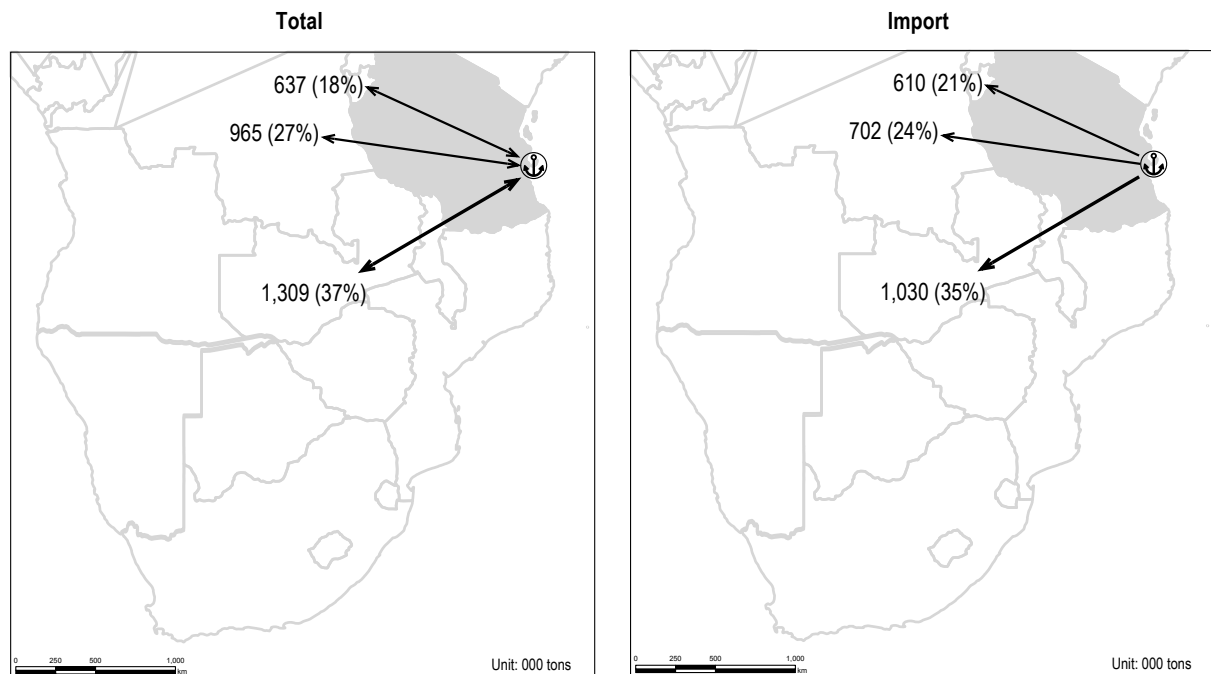
Unit: 000 tons

		Break & dry bulk	Liquid bulk	Container	Total	Share
Tanzania	Imports	2,183	2,334	2,405	6,923	-
	Exports	108	75	1,215	1,397	-
	Transshipment	0	0	0	87	-
	Subtotal	2,291	2,409	3,620	8,407	-
Transit	Imports	406	1,929	1,161	2,945	100%
	Exports	0	0	628	628	100%
	Subtotal	406	1,929	1,789	3,574	100%
Zambia	Imports	118	598*	313	1,030	35%
	Exports	0	0	279	279	44%
	Subtotal	118	598*	592	1,309	37%
DRC	Imports	19	312	370	702	24%
	Exports	0	0	264	264	42%
	Subtotal	19	312	634	965	27%
Burundi	Imports	26	137	125	287	10%
	Exports	0	0	21	21	3%
	Subtotal	26	137	146	308	9%
Rwanda	Imports	93	235	281	610	21%

	Exports	0	0	27	27	4%
	Subtotal	93	235	309	637	18%
Malawi	Imports	11	27	36	75	3%
	Exports	0	0	19	19	3%
	Subtotal	11	27	55	93	3%
Uganda	Imports	116	42	32	189	6%
	Exports	0	0	1	1	0%
	Subtotal	116	42	33	191	5%
Others	Imports	23	27	4	53	2%
	Exports	0	0	17	17	3%
	Subtotal	23	27	20	70	2%
Total	Imports	2,589	4,263	3,566	9,868	-
	Exports	108	75	1,843	2,026	-
	Transshipment	0	0	0	87	-
	Total	2,697	4,338	5,409	11,981	-

Note: * 0.55 million tons of petroleum was transported through TAZAMA pipeline.

Source: Tanzania Port Authority Annual Statistical Report for 2012-13 (TPA)



Source: Tanzania Port Authority Annual Statistical Report for 2012-13 (TPA)

Figure 4.14: Destination and origin of transit cargo

4.1.3.3 Regional cargo flows in SADC

Table 4.14 and Figure 4.15 show the results of the transit cargo analyses. The total trade in inland countries amounted to 37 million tons of cargo; however, the total transit cargo and pipeline transport was only 8.6 million tons. The difference between the total trade volume of inland countries and transit cargo volume amounted to 28.4 million tons.

There are two reasons that can explain the difference. The first one is the limitation of the data, in particular, the lack of transit data in South Africa. The second one is “intra-SADC trade” that is in fact “transit”, but not counted statistically as “transit”. The volume of the intra-SADC trade

calculated from the seaborne cargo and the total trade volume is 31.2 million tons, which is similar to the difference between the total trade volume of inland countries and transit cargo (28.4 million tons).

According to logistics companies, some import cargo landed at Durban is shipped to inland countries after customs clearance at Johannesburg. Such “re-exported” cargo is not counted as transit cargo. In the next stage of this master plan study, it is necessary to analyse such cargo flow in more detail, in order to find a solution to enable Namibia to have such a market as well as transit cargo transport.

In order to achieve 1 million TEUs of container handling at Walvis Bay Port in 2020 as Namport planned, it is indispensable to increase transport volume to its hinterland, i.e. the landlocked areas of SADC. That is why it is necessary to endeavour to expand its market to that area. Currently, Angola is a major destination of transhipped and transit cargo through Walvis Bay Port (refer to section 4.1.3) because Angola has a market with population of 50 million. On the other hand, ports in Angola are improving in terms of physical infrastructure and cargo handling services day-by-day. Given these facts, the major sustainable markets for Namibia will be the landlocked areas of SADC that cannot have their own ports.

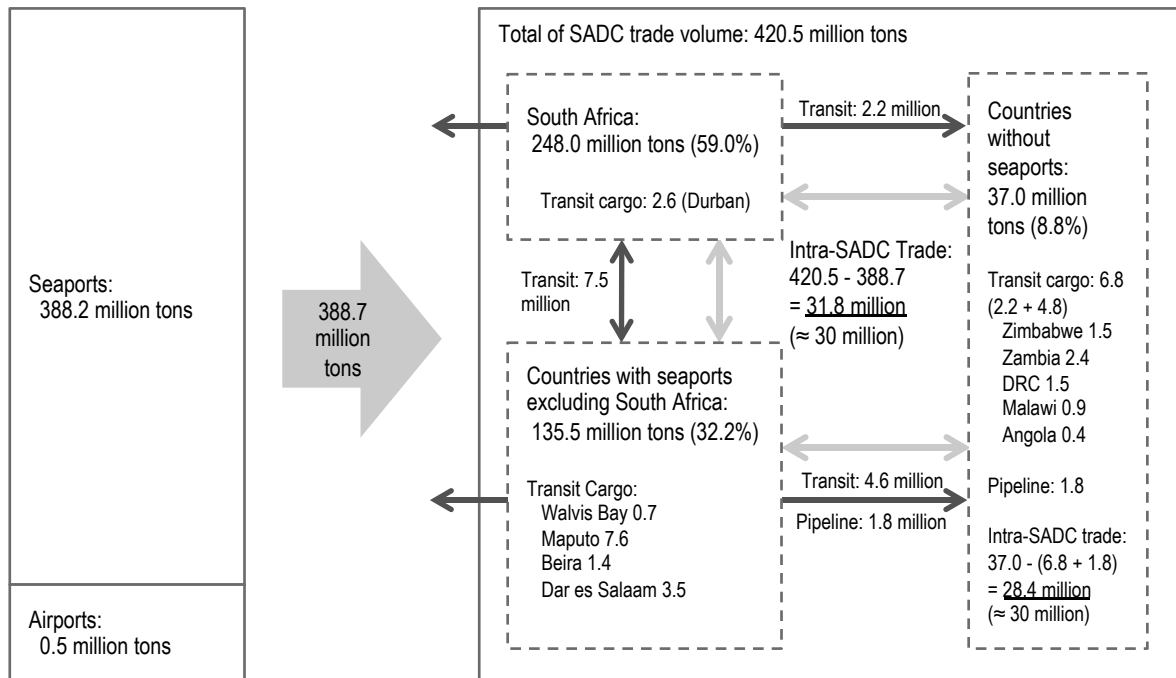
Table 4.14: Estimated flow of transit cargo in SADC

Unit: 000 tons

		Angola	Zambia	DRC	Zimbabwe	Malawi	Botswana	Total	Others	Total
Walvis Bay	Total	268	207	57	139	6	32	708	12	720
	Import	267	155	53	139	3	32	650	4	653
Durban	Total	179	769	513	667	103	-	2,231	333	2,564
	Import	96	413	276	358	55	-	1,199	179	1,378
Maputo	Total	-	-	-	153	-	-	153	7,477	7,630
	Import	-	-	-	-	-	-	-	-	-
Beira	Total	-	202	2	552	657	-	1,413	-	1,413
	Import	-	169	2	347	510	-	1,028	-	1,028
Dar es Salaam	Total	-	1,309	965	-	93	-	2,367	1,206	3,525
	Import	-	1,030	702	-	75	-	1,807	1,139	2,898
Total	Total	447	2,440	1,536	1,510	858	32	6,824	9,028	15,852
	Import	364	1,720	1,033	844	643	32	4,635	1,322	5,957

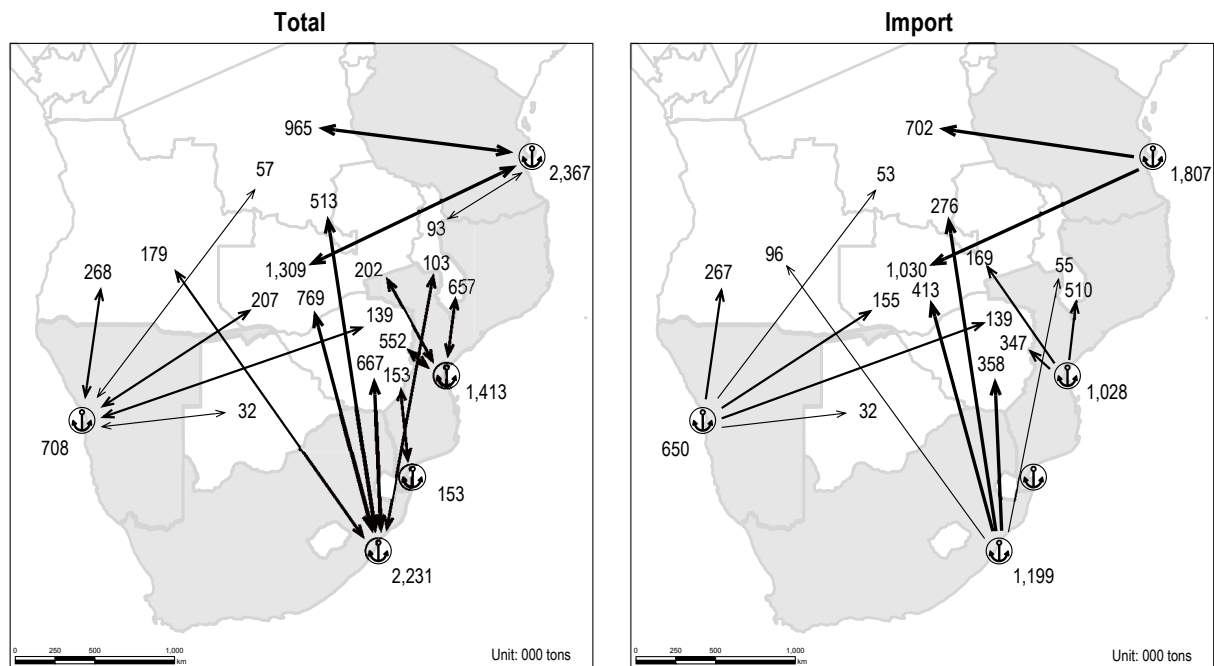
Note: Others include South Africa, Mozambique, Rwanda, Burundi, Uganda, etc.

Source: JICA Study Team



Source: JICA Study Team

Figure 4.15: Estimated cargo flow of SADC



Source: JICA Study Team

Figure 4.16: Flow of total transit cargo in SADC excluding pipeline

4.2 Competitiveness and position of Namibia as a gateway to the inland countries

4.2.1 Profiles of available shipping services

4.2.1.1 Frequency of shipping service

Overview of container shipping service

Durban Port is well connected to the rest of the world and has about 150 container ship calls in one month. As a gateway port for West Africa, Walvis Bay Port has about 55 container ship calls in one month, of which 22 each from West Africa and Asia, and 9 from Europe. As a gateway port for East Africa, Dar es Salaam has 35 containership calls in one month, of which 13 are from the Middle East and 16 from Asia.



Source: Walvis Bay and Durban is based on FTW (Nos. 2103 and 2104). Beira is based on "Ports and Ships Website", shipping line HP and "marine traffic.com" Dar es Salaam is based on the TPA website and shipping line HP and "marine traffic.com".

Figure 4.17: Container shipping service of gateway ports in SADC per month

Walvis Bay Port

Shipping lines calling at Walvis Bay Port in one month (from 19/05/2014 to 16/06/2014) are indicated in Table 4.15. Major shipping lines are Maersk, CMA CGM, MSC and MACS.

Table 4.15: Shipping service at Walvis Bay Port

Month	Day	Name of ship	Line	WA	NA	Med	UK	FE	Aus
May	19	Safmarine Lonaa SA14003	DAL/MSK/SAF	•					
May	19	Atlantic Eland 402	CSA/HLC		•				
May	21	Charlotte Schulte 1404	CMA/MSK/SAF					•	
May	21	Charlotte Schulte 1403	CMA/MSK/SAF	•					
May	23	CMA-CGM Africa One WW727W	CMA	•				•	

4. Logistics Network in SADC and Namibia

Month	Day	Name of ship	Line	WA	NA	Med	UK	FE	Aus
May	23	CMA-CGM Amber DH453W	CMA/DEL	•				•	
May	23	Irenes Loaos 1406	MSK/SAF	•		•	•		
May	23	Maersk Cadiz 1404	CMA/MSK/SAF					•	
May	25	Bright Sky 4118	MAC				•		
May	28	Clemens Schulte 1401	CMA/MSK/SAF	•					
May	28	Clemens Schulte 1402	CMA/MSK/SAF					•	
May	28	Glovis Champion 7	GLV/HOE/HUA					•	•
May	29	AS Castor ZA420A	MSC	•					
May	30	Chicaao DH455W	CMA/DEL	•				•	
May	30	Clara Maersk 1410	MSK/SAF	•		•	•		
May	30	Maersk Conakry 1406	CMA/MSK/SAF					•	
May	31	JPO Leo MU745	CMA/DEL	•					
June	2	Ulsnis ZA419A	MSC	•					
June	4	Cad Schulte 1402	CMA/MSK/SAF					•	
June	4	Blue Master 4119	MAC				•		
June	4	Carl Schulte 1401	CMA/MSK/SAF	•					
June	6	Safmarine Chilka 1406	CMA/MSK/SAF					•	
June	6	Tove Maersk 1406	MSK/SAF	•		•	•		
June	7	CMA-CGM Puccini DH457W	CMA/DEL	•				•	
June	7	Maersk Cameroun 1404	CMA/KEE/MSK/SAF					•	
June	7	Msc Grace ZA422A	MSC	•					
June	8	Chief MU745	CMA/DEL	•					
June	10	Safmarine Lonaa SA14003	SAF	•					
June	11	Wieland 1402	CMA/MSK/SAF					•	
June	11	Wieland 1401	CMA/MSK/SAF	•					
June	13	Maersk Cabo Verde 1404	CMA/MSK/SAF					•	
June	13	Maersk Westport 1406	MSK/SAF	•		•			
June	14	CMA-CGM Mozart DH459W	CMA/DEL	•				•	
June	14	Minna MU749	CMA/DEL	•					
June	15	Veaa Virao ZA423A	MSC	•					
				22	1	4	5	15	1

Note: WA West Africa, NA North America, Med Mediterranean, FE Far East, Aus Australasia
Source: Freight and Trade Weekly (Nos. 2103, 2104).

Durban Port

Shipping lines calling at Durban during one month (19/05/2014 - 16/06/2014) are indicated in Table 4.16. Major shipping lines are Maersk, CMACGM, MSC, PIL, MACS and so on.

Table 4.16: Shipping service at Durban Port

Month	Day	Name of ship	Line	WA	EA	NA/SA	Eur	ME/IND	FE	Aus
May	19	Bright Sky 4118	MAC				•			
May	19	Falshoefft 903	UAF					•		
May	19	GSL Africa 783	GSUZIM	•						
May	19	Rhodos 143B	DAL/MOL/MSK/SAF	•		•	•			
May	20	Diaporos 1403	CMA/MSK/SAF						•	•
May	20	Msc Nicole ZN416A	MSC		•					
May	20	UAL Pioneer 514..	UAL	•						
May	21	Hoeah Detroit 57	GLV/HOE/HUA							•
May	21	Kota Lahir 077	HLC/KLI/MOL/PIL						•	
May	21	Msc Nilgun 003	MSC/MSK/SAF			•				
May	21	Thai Harvest 025	GRB/UNG						•	
May	22	Cosco Yinakou 059E	COS/EMC/MBA			•		•	•	•
May	22	MCP Linz 8R009R	CMA/DEU/SAF		•					
May	22	Msc Barbara NZ421 R	MSC/HLC/HSL/LTI	•			•			
May	22	Northern Dependant 1408	DAL/MSK/SAF					•		
May	22	Rickmers Malaysia 1415	DAL/MOL/MSK/OAC/SAF		•					
May	23	Msc Messina IZ421A	MSC		•			•		•
May	23	Safmarine Lonaa SA14003	SAF	•						

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Month	Day	Name of ship	Line	WA	EA	NA/SA	Eur	ME/IND	FE	Aus
May	24	Msc Azov 418A	MSC			•				
May	24	Toledo C0412	WWL					•		•
May	25	CSCL Panama 0053W	CSC/HLC/KLI/NDS/NYK/SMU/STS	•						
May	25	JPO Leo MU745	CMA/DEL	•						
May	25	Kota Nekad NKD072	PIL	•					•	
May	25	Maersk Santana 412E	CMA/CSV/HJS/SAF						•	
May	25	MscAjaccio F1418R	MSC						•	
May	25	Niledutch Cheetah 30204A	NDS	•						
May	25	Wehr Elbe 205	HSD/STS			•				
May	26	Hammonia Africum 784	GSL/ZIM	•						
May	26	Louis S MU57	CMA/DEL	•				•		
May	26	MOL Proficiency 144B	DAL/MOL/MSK/SAF	•		•	•			
May	27	Msc Positano ZN417A	MSC		•					
May	28	Blue Master 4119	MAC				•			
May	28	Border 111S	MSC/DAUMOUMSK/OAC/SAF	•						
May	28	Kota Akbar AKA 150	PIL	•				•		
May	28	Msc Martina 011	MSC/MSK/SAF			•				
May	29	Ital Fulaida 0454-049E	COS/EMC/MBA			•		•	•	•
May	29	Mornina Composer C0413	WWL							•
May	29	Msc Rita NZ422R	MSC/HLC/HSL/LTI	•			•			
May	29	NOCC Katteaat 014	GLV	•						
May	29	NYK Isabel 0363E	CSC/HLC/KLI/NDS/NYK/STS/ZIM				•		•	
May	29	Sagitta 1408	DAL/MSK/SAF					•		
May	31	Chief MU745	CMA/DEL	•						
May	31	Glovis Superior 003	GLV	•	•		•			
May	31	Seroia Enam IZ422A	MSC		•			•		•
June	1	CSCL Oceania 413E	CMA/CSV/HJS/SAF						•	
June	1	Kota Nazar NZR072	PIL	•					•	
June	1	NYK Made 0323W	CSC/HLC/KLI/NDS/NYK/SMU/STS	•						
June	1	Santa Ines 419W	MSC			•				
June	2	Alexandra 143B	DAL/MOL/MSK/SAF	•		•	•			
June	2	Bosun MU737	CMA/DEL	•				•		
June	2	Glovis Superior 003	GLV	•			•			
June	2	Kota Hakim HKM357	PIL	•				•		
June	2	Kota Harum HRU152	PIL	•				•		
June	2	Marie 1421	GAL			•				
June	2	Santa Felicita 785	GSL/ZIM	•						
June	3	Kota Lambang 093	HLC/KLI/MOL/PIL						•	
June	3	Msc Denisse ZN418A	MSC		•					
June	5	Henry Rickmers 1408	DAL/MSK/SAF					•		
June	5	Ninabo Express NZ423R	MSC/HLC/HSL/LTI	•			•			
June	5	Rickmers Malaysia 1417	DAL/MOL/MSK/OAC/SAF		•					
June	6	Hoeah Antwerp 6	GLV/HOE/HUA		•			•		•
June	6	Petrohue 1Z423A	MSC		•			•		•
June	6	Polonia MUS59E	CMA/DEL	•				•		
June	6	Tomar C0414	WWL							•
June	7	Caecilia Shulte 36S	MSC/DAL/MOUMSK/OAC/SAF	•						
June	7	MCP Linz 8R009R	CMA/DEUAF		•			•		
June	8	Amoliani 143B	DAL/MOL/MSK/SAF	•		•	•			
June	8	CMA-CGM Tosca 396E	CMA/CSV/HJS/SAF						•	
June	8	CSCL Montevideo 0121W	CSC/HLC/KLI/NDS/NYK/SMU/STS	•						
June	8	Hoeah Coenhaen 28	GLV/HOE/HUA							•
June	8	Jolly Quarzo 091	LMC/STS				•	•		
June	8	Msc Natalia F1420R	MSC						•	
June	8	Msc Aadir 420A	MSC			•				
June	8	MscArica F1419R	MSC					•	•	
June	8	Niledutch Gazelle 206	HSD/STS			•				
June	8	uuiry cu LM I	LNRI/J I J		•					
June	9	RDO Honour 30205A	NDS	•						
June	10	Budapest Bridge 017	HLC/KLI/MOL/PIL						•	

Month	Day	Name of ship	Line	WA	EA	NA/SA	Eur	ME/IND	FE	Aus
June	10	Msc Jasmine ZN419A	MSC		•					
June	11	Maersk Vama 022	MSC/MSK/SAF			•				
June	12	Atlantic Impala 403	CSA/HLC			•				
June	12	Balao 1403E	CSC/HLC/KLI/NDS/NYK/STS/ZIM				•		•	
June	12	Glovis Caravel 1	HOE		•					
June	12	Ital Fiducia 0456-058E	COS/EMC/MBA			•		•	•	•
June	12	Kota Anaun AGN158	PIL	•				•		
June	12	Maersk Inverness 1408	DAL/MSK/SAF					•		
June	13	Falshoef 904	UAF		•			•		
June	13	Glovis Spirit 005	GLV	•			•			
June	13	Portuaal IZ424A	MSC		•			•		•
June	13	Sophie 4120	MAC				•			
June	14	Alliance Norfolk 61	HOE/HUA	•	•	•				
June	14	Daphne MU751W	CMA/DEL	•						
June	14	Hoeah London 51	GLV/HOE/HUA							•
June	14	Mac Paris NZ424R	MSC/HLC/HSL/LTI	•			•			
June	14	MscAmalfi 421A	MSC			•				
June	15	CSCL San Jose 0053W	CSC/HLC/KLI/NDS/NYK/SMU/STS	•						
June	15	Msc Texas FI421 R	MSC					•	•	
June	15	Santa Rosa 415E	CMA/CSV/HJS/SAF						•	
June	15	Thai Dawn 144	GRB/UNG						•	
June	16	Dubai Star 786	GSUZIM	•						
June	16	Katherine 144B	DAL/MOL/MSK/SAF	•		•	•			
June	16	Letavia MU739	CMA/DEL	•				•		
				41	18	20	18	27	21	15

Note: WA West Africa, EA East Africa, NA North America, SA South America, Eur Europe, ME Middle East, IND India, Aus Australasia
Source: Freight and Trade Weekly (Nos. 2103, 2104).

Beira Port

Shipping lines calling at Beira Port during one month are indicated in Table 4.17. As shown in Figure 4.18, major shipping lines are Maersk, CMA CGM, MSC, PIL EMIRATES and DELMAS.

Table 4.17: Shipping service at Beira Port

Month	Date	Name of ship	Shipping line	EAF	SEA
May	2	RMS Buchholz	(Maputo)	•	
May	3	Onego Buran	CMA CGM	•	
May	6	Kota Naga	PIL		•
May	7	RT Aegir	Maersk		•
May	8	MSC Jasmine	MSC	•	
May	8	RMS Buchholz	(Maputo)		•
May	11	ER Bremerhaven	CMA CGM		•
May	20	Natalie Schulte	Maersk		•
May	21	MCP Linz	CMA CGM	•	
May	21	MSC Chiara	MSC	•	
May	21	MSC Denisse	MSC	•	
May	21	MSC Namibiall	MSC		•
May	22	Kota Naluri	PIL		•
May	24	RMS Voerde	?		
May	26	Onego Buran	CMA CGM	•	
May	26	RMS Voerde	?		
May	27	Rickmers Malaysia	?		
May	28	MSC Jasmine	MSC	•	
May	28	RMS Voerde	?		
May	29	Kota Niam	PIL		•

Note: EAF East Africa, SEA South East Asia
Source: "Ports and Ships website," shipping line website and maritimetraffic.com



Source: <http://www.cornelder.co.mz/index.php/shippinglines>

Figure 4.18: Frequency of calls of shipping lines

Dar es Salaam Port

Shipping lines, which were scheduled to call at Dar es Salaam during one month, are as indicated in Table 4.18. Major shipping lines are Maersk (9 calls), CMA CGM (7 callings), MSC (7 calls), PIL (5 calls), Evergreen (3 calls), and Messina (3 calls).

Table 4.18: Shipping service at Dar es Salaam Port

Month	Date	Name of s/hip	Agent	ME	EU	SEA	FE	SA	EAF
May	05	JOLLY PERLA	MESSINA	•	•				
May	06	MAERSK ALABAMA	MAERSK	•					
May	07	COMMODORE	CMA CGM			•			
May	08	WESTERLAND	CMA CGM			•			
May	10	JPO SAGITTARIUS	MAERSK	•					
May	11	CAPE MOSS	EVERGREEN			•			
May	11	MSC JEMIMA	MSC	•					
May	11	MV MANTENHA	MSC						
May	12	KOTA NIPAH	PIL			•	•		
May	12	MSC DENISSE	MSC					•	
May	13	ADA S	MAERSK						
May	14	MV BRAVO	CMA CGM			•			
May	15	APULIA	ESS	•					
May	15	MSC ANAHITA	MSC	•					
May	15	MV KATHARINA	CMA CGM	•					
May	17	CAPE MAAS	EVERGREEN			•			
May	17	HARLAD S	MAERSK						
May	18	MSC JEANNE	MSC	•					
May	19	CITY OF BEIJING	SINOTASHIP			•			
May	19	KOTA HENING	PIL	•					
May	20	HAMMONIA BAVARIA	MAERSK			•			
May	20	MSC JASMINE	MSC					•	
May	21	KOTA FAJAR	PIL			•	•		
May	21	KOTA TEGUH	PIL						•
May	23	JOLLY PERLA	MESSINA		•				
May	24	ER CAEN	MAERSK						
May	24	HS CHALLENGE	CMA CGM	•					
May	26	EMIRATES NILE	ESS			•			
May	27	ER COPENHAGEN	MAERSK						
May	28	JOLLY QUARZO	MESSINA		•				
May	29	CMA CGM IGUACU	CMA CGM	•					
June	1	CAPE MALE	CMA CGM			•			
June	1	MSC IMMA	MSC	•					
June	1	THEA S	MAERSK	•					
June	2	KOTA NELAYAN	PIL			•	•		
June	3	HAMMONIA HUSSUM	MAERSK						
June	4	MESSINI	EVERGREEN			•			
				13	3	13	3	2	1

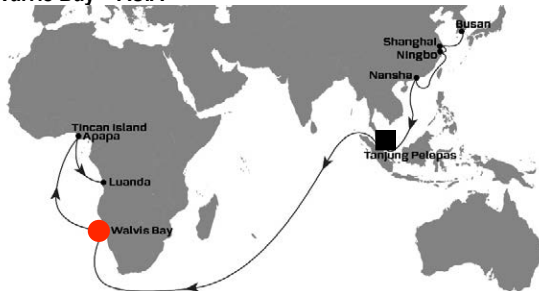
Note: ME Middle East, EU Europe, SEA South East Asia, FE Far East, SA South Africa, EAF East Africa
Source: TPA website, shipping line HP and marine traffic.com.

4.2.1.2 Shipping service routes by shipping lines

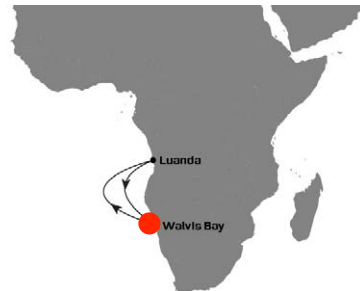
Maersk

Maersk has 3 major shipping routes to between Asia, Europe and North America at and Walvis Bay Port. It has a direct service to Asia, but the cargo for Europe and North America is transhipped at Algeciras in Spain. It has direct services between Europe, North America, South East Asia and the Far East and Durban Port. At Dar es Salaam Port it has services to the Middle East and South East Asia where the cargo to Europe and the Far East is transhipped.

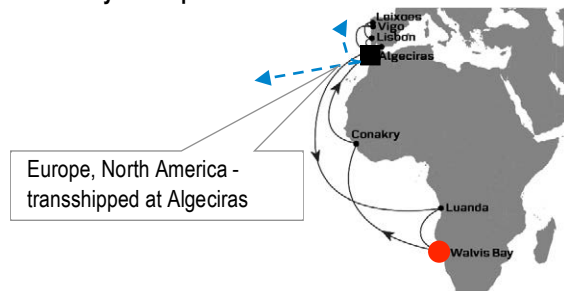
Walvis Bay – ASIA



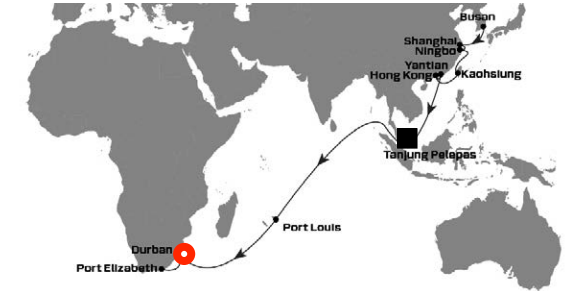
Walvis Bay – Angola



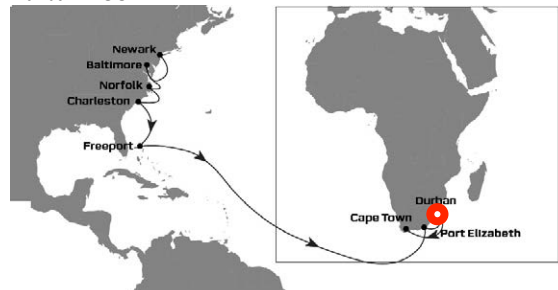
Walvis Bay – Europe and USA



Durban – Asia



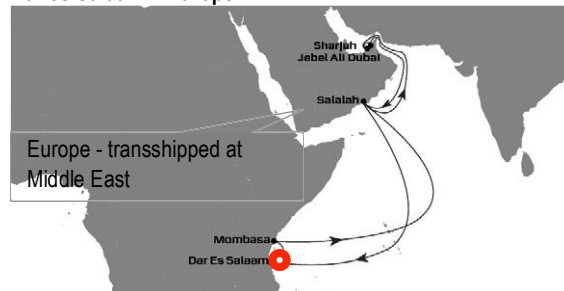
Durban – USA



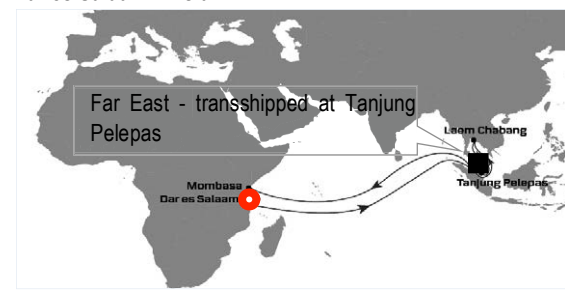
Durban – Europe



Dar es Salaam – Europe



Dar es Salaam – Asia



Source: MAERSK Web Site, interviews with MAERSK staffs

Figure 4.19: Container shipping services of MAERSK

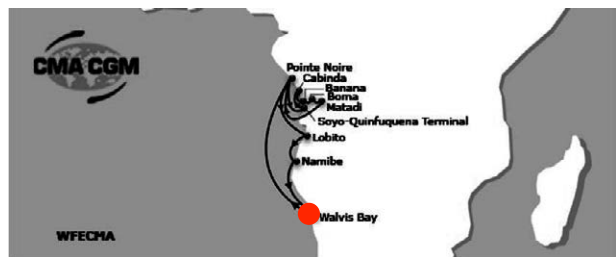
CMA CGM

CMA CGM has two direct services between Asia and North America and Walvis Bay Port. Cargos for European countries seem to be transhipped at ports in West Africa. At Durban Port, it has a lot of services, but destinations of the transport services seem to be almost the same as Walvis Bay. At Dar es Salaam Port, it has services to the Middle East and South East Asia where the cargo for Europe and the Far East seems to be transhipped.

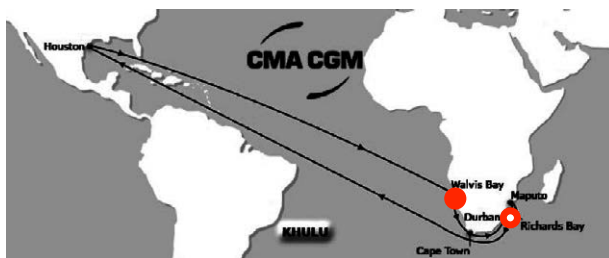
Walvis Bay – Asia



Walvis Bay – West Africa



Walvis Bay and Durban – USA



Durban – Asia



Walvis Bay and Durban – West Africa and Middle East



Dar es Salaam – Asia



Dar es Salaam – Middle East



Source: CMA CGM Website, interview with CMA CGM staffs

Figure 4.20: Container shipping service of CMA CGM

Maersk and CMA CGM also operate container terminals. Figure 4.21 and Figure 4.22 are examples

of CMA CGM. Figure 4.21 show container terminals operated by Terminal Link which is a subsidiary of CMA CGM, and Figure 4.22 show container terminals operated by CMA CGM Terminals. A.P. Moller-Maersk has a subsidiary for container terminal operation, called APM Terminals. The APM Terminals operate 70 ports in 67 countries.



Note: Terminal Link is a joint venture of CMA CGM (51%) and China Merchants Holdings International (49%)
Source: <https://www.cma-cgm.com/the-group/activities/shipping/terminals>

Figure 4.21: Terminal operated by Terminal Link



Source: <https://www.cma-cgm.com/the-group/activities/shipping/terminals>

Figure 4.22: Terminal operated by CMA CGM Terminals

MACS

MACS provides direct services to Europe and North America. It operates multi purpose vessels and handles both container and project cargo.



Source: MACS Brochure

Figure 4.23: Shipping service of MACS

Other shipping lines

There are other major shipping lines operating at the southern African ports. MSC is the major one, however, data is not available at the moment.

4.2.2 Port facilities and port operators

4.2.2.1 Walvis Bay Port

Walvis bay Port has 3 container berths. Construction of the new container terminal started on 9 May 2014, and the capacity will increase from 350,000 TEUs to 1 million TEUs by 2017.

Table 4.19: Container terminal of Walvis Bay Port

	Current situation	Future plan
Berth	Berth1-3	New container terminal
Depth	-14m	-16m
Length	500m	600m (Area of 40ha)
Crane	Mobile harbour crane	4 Gantry Cranes (based on the picture of brochure)
Capacity	0.35 million TEUs	0.65 million TEUs
Operator	Namport	-

Source: Namport web site, brochures



Source: Namport web site, brochures

Figure 4.24: Existing and new container terminals in Walvis Bay Port

4.2.2.2 Durban Port

Durban Port has 8 container berths at Pier 1 and 2. The capacity of the Pier 1 terminal will increase from 700,000 TEUs to a potential 1.3 million TEUs after extension of the Pier to Salisbury Island by 2016. The capacity of Pier 2 will increase from 2.9 million TEUs to 3.3 million TEUs by 2017/18 too. Deepening of the Pier 2 berths and landfill and extension of Pier 1 container terminal are the next capacity expansion projects, and these projects would bring DCT's capacity to 5.1 million TEUs in 2021/22.

The entrance channel to the port has been widened and deepened to allow safer navigation for vessels up to 9,200 TEUs. There is also a study in progress to address berth deepening in the bay. Thereafter a Dig-Out Port is planned to be the next large tranche of capacity that will come online from 2026/27 with increments of capacity, in order to meet the 30-year demand forecast.

Table 4.20: Outline of Durban container terminal

	Pier1	Pier2
Berth	Berth 100-107 *Container berths are 2 berths of those berths.	Berth 200-205 *All berths are container berth.
Depth	-12.8m(design Depth) *Berth 100= -9.1 *Berth 101-107= -12.8	-12.8(design Depth) * To be deepened to 16m end 2013/14 at north quay.
Length	1990m -Berth100: 276m -Berth101: 229m -Berth102: 213m	1583m -Berth200: 236m -Berth201: 216m -Berth202: 216m

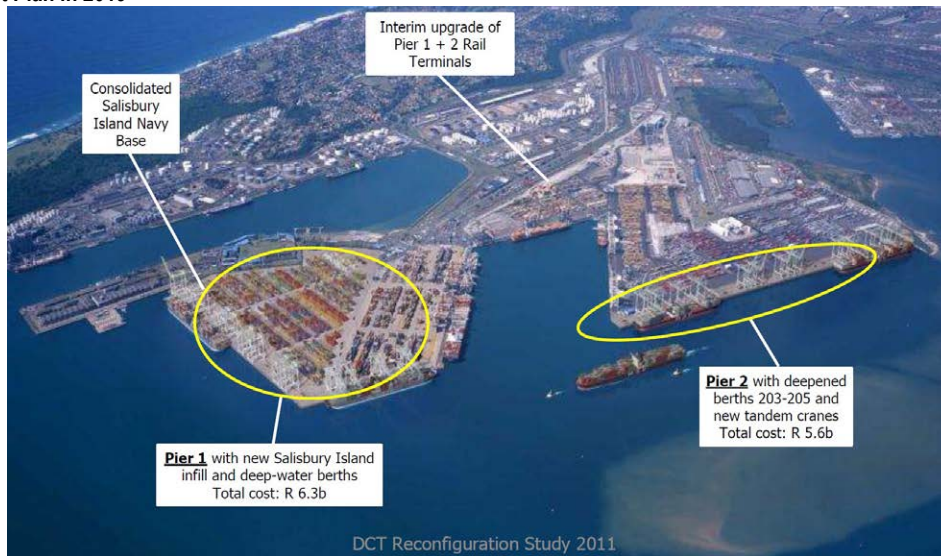
	Pier1	Pier2
	-Berth103: 235m -Berth104: 351m -Berth105: 235m -Berth105: 213m -Berth105: 238m	-Berth203: 305m -Berth204: 305m -Berth205: 305m
Crane	6 gantry crane (Observation from Google Map)	20 gantry crane (Observation from Google Map)
Capacity	0.7 million TEUs	2.9 million TEUs
Operator	Transnet	Transnet

Source: Transnet web site, Google map

Current Plan



Future Layout Plan in 2019



Source: TRANSNET PORT TERMINALS- Connectivity through our ports Moshe Motlohi, Executive Manager Strategy - 29 October 2013, pp.55-59.

Figure 4.25: Current and future plan of Durban container terminal (1/2)

Long Term Potential Layout



Future Plan for Durban-Artist's View of the new Dig-Out Port at ex-DIA Site



Source: TRANSNET PORT TERMINALS- Connectivity through our ports Moshe Motlohi, Executive Manager Strategy - 29 October 2013, pp.55-59.

Figure 4.26: Current and future plan of Durban container terminal (2/2)

4.2.2.3 Beira Port

Container The container terminal of Beira Port has a berth length of 645 meters, which comprises of

berths numbers 2, 3, 4 and 5. The designed depth alongside of the quays is about 12 meters. The Terminal projected capacity is 400,000 TEUs per year. Cornelder de Moçambique (CdM) operates the container terminal, which is a private joint venture between Moçambique Ports and Railways (CFM) and Cornelder Holdings based in Rotterdam.

Table 4.21: Container terminal outline of Beira Port

	Pier1	Note
Berth	Quay 2-5	Cornelder de Moçambique (CdM) is a private joint venture between Moçambique Ports and Railways (CFM) 33% and Cornelder Holdings based in Rotterdam 67%. CdM operates has operated the Container and General Cargo Terminals in the Port of Beira since October 1998.
Depth	-12.0m	
Length	646m	
Crane	Ship-to-shore gantry crane 2 Rail mounted gantry crane 1	
Capacity	400,000TEUs	
Operator	Cornelder de Moçambique	

Source: Cornelder de Moçambique website, Port Master Plan for the Port of Beira, Mozambique (Royal Haskoning DHV, 2013)



Source: Cornelder de Moçambique website, Port Master Plan for the Port of Beira, Mozambique (Royal Haskoning DHV, 2013)

Figure 4.27: Current plan of Beira Port

4.2.2.4 Dar es Salaam Port

The container terminal of Dar es Salaam consists of 4 berths on a continuous 725 metre quay with the depth alongside 12.2 metres. A 140 metre wide channel with a depth of 10.7 metres provides access from the open sea. The quayside is equipped with five ship-to-shore gantry cranes (SSGs), each with a capacity of 45 metric tons. The quay is able to accommodate three vessels at any one time at Berths 8, 9, 10 and 11. Moreover there are two inland container depots that are located 1.6 kilometres and 16 kilometres from the container terminal. The container terminal is operated by TICTS that is a joint venture between Hutchison Whampoa (75%) and Vertex Financial Service

(25%).

Table 4.22: Container terminal outline of Dar es Salaam Port

	Pier1	Note
Berth	Berth 8-11, TICT	TICTS is a private joint venture between Hutchison Whampoa (75%) and Vertex Financial Service (25%).
Depth	Quay -12.2, channel -10.7m	
Length	725m	
Crane	Ship to shore gantry crane 5	
ICD	Kurasini ICD (6.7ha), Ubungo ICD (8.63ha)	
Operator	Tanzania International Container Terminal Services Ltd (TICTS)	

Source: annual report and accounts for 2012, TICTS website, http://www.ocdi.or.jp/pdf/79_kaigai02.pdf



Source: TPA Year Book 2006, Port Master Plan (2009, WB), Tanzania International Container Terminal Services Ltd (TICTS) website

Figure 4.28: Layout of the Tanzania International Container Terminal

4.2.3 Cost and transit time

In order to set a benchmark of the current competitiveness of Namibia routes, the transportation cost and transit time for exporting copper from Kitwe to Europe, North America and Asia, are analysed. This preliminary calculation is based on interviews with logistics companies, truck drivers etc. The calculation is based on the following:

- Origin: Kitwe (Copper Belt),
- Ports: Walvis Bay, Durban, Beira and Dar es Salaam,
- Cargo: copper, no return cargo, and

- Unit price includes trucking cost, security cost, border cost and all other necessary costs.

Table 4.23: Comparison of distance, cost and transit time from the inland to the world

Origin	Destination	Distance (km)	Transit time	Note
Kitwe	Walvis Bay	2,480	4 – 5 days	
Kitwe	Dar es Salaam	1,968	12 – 14 days	
Kitwe	Durban	2,579	7 – 10 days	Zimbabwe route
		2,796	7 – 10 days	Botswana route
Kitwe	Beira	1,293	6 – 8 days	

Source: distance is based on MICHELIN map; transit time is based on interview with logistics companies and truck drivers

Table 4.24: Examples of trucking cost of copper transport

Origin	Destination	Unit Price (USD/ton)	Weight (ton/truck)	Trucking cost (USD/truck)
Kitwe	Walvis Bay	180	32	5,760
Kitwe	Dar es Salaam	170	32	5,440
Kitwe	Durban	180	32	5,760
Kitwe	Beira	160	32	5,210

Source: Interview with logistics companies.

Table 4.25: Dwell time at ports

Destination	Transit time	Note
Walvis Bay	2-3 days	Interview with logistics company
Dar es Salaam	3 weeks-4 weeks	Interview with logistics company
Durban	3-4 days	Cargo Dwell Time in Durban (WB, 2011)
Beira	18 days	In 2011 information from Logistics Review of the Beira and Nacala Corridors (USAID, 2012)

Source: Interviews with logistics companies.

Table 4.26: Example of cost of ocean freights

Ports	Destination	Transport cost of (USD/TEU)
Walvis Bay	Rotterdam	1,551
	Shanghai	1,405
	Newark	2,698
Durban	Rotterdam	1,830
	Shanghai	1,156
	Newark	3,630
Dar es Salaam	Rotterdam	2,057
	Shanghai	867

Note: Including surcharge; 20 feet dry container

Source: Interviews with shipping lines

Table 4.27: Example of transit time of ocean freights

Ports	Destination	Transit time (days)	Assumed route and transit time
Walvis Bay	Rotterdam	31	WalvisBay–21 days–Algeciras–10 days–Rotterdam
	Shanghai	34	Direct
	Newark	28	WalvisBay–21 days–Algeciras–7 days–Newark
Durban	Rotterdam	25	Direct
	Shanghai	34	Direct
	Newark	31	Direct
Dar es Salaam	Rotterdam	30	Dar es Salaam–10 days–Salalah–20 days–Rotterdam
	Shanghai	38	Dar es Salaam–22 days–Tanjung Pelepas–16 days–Shanghai

Note: Transit time dose not include waiting days at the transshipment port.

Source: Interview with shipping lines

4.2.4 Result of calculation

As the result of the preliminary calculation, it is confirmed that Walvis Bay Port has a time advantage regarding export to Asia and North America. The port seems to have a cost advantage as well. It is, however, noted that the precondition of this preliminary calculation is “one way”. In reality, it is quite easy to get return cargo at Durban unlike at Walvis Bay and therefore in practice the total trucking cost is much lower for the Durban route. This means that higher availability of return cargo is an important factor that makes the Durban route most preferred. This means that improvement in availability of return cargo is one of the critical factors for Namibia to lower the land transport costs.

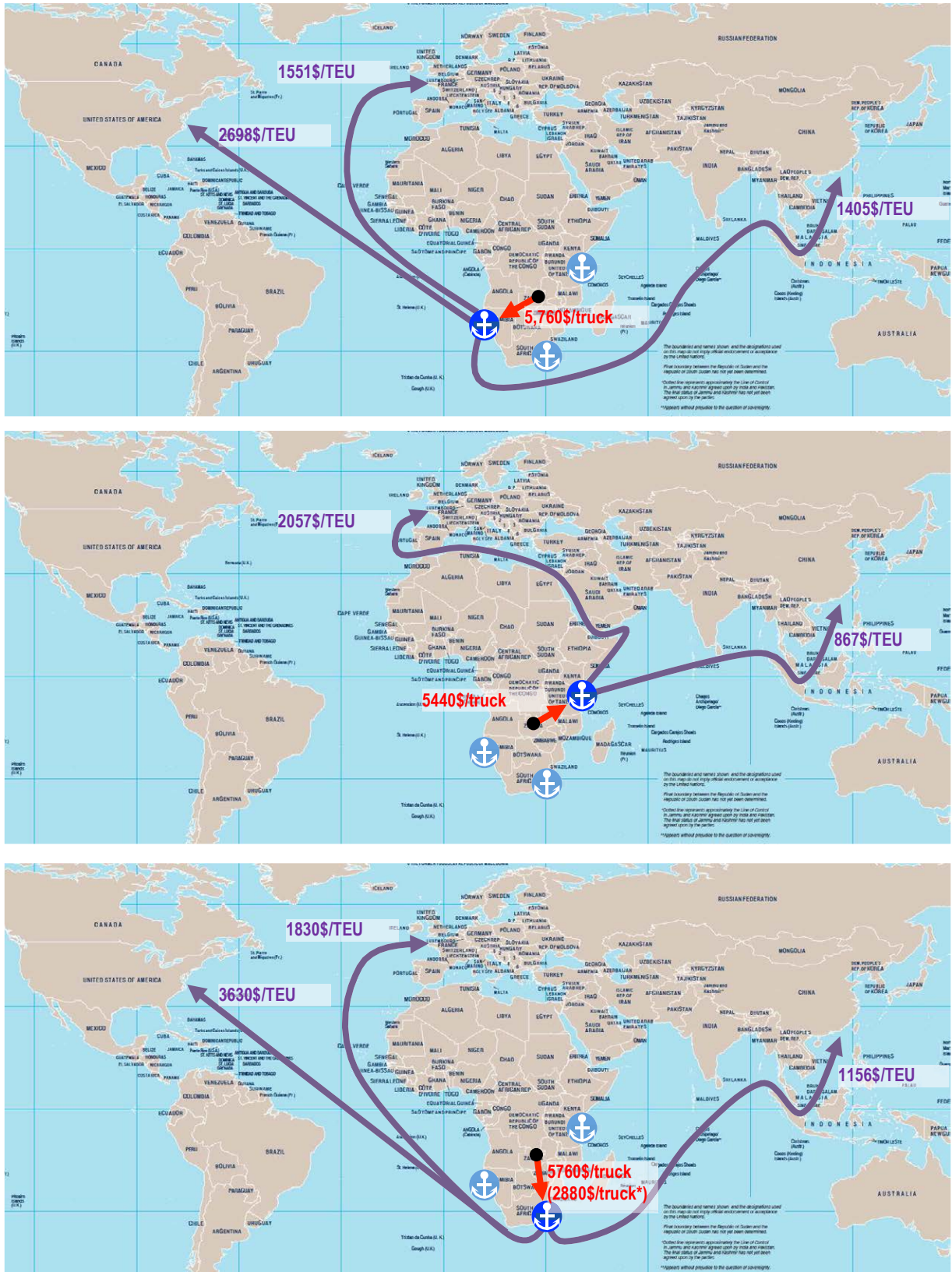
Table 4.28: Result of calculation

Ports	Destination	Transportation cost (USD)			Transit time (days)			
		Trucking	Ocean	Total	Trucking	Port	Ocean	Total
Walvis Bay	Rotterdam	5760	1551	7311	4	2	31	37
	Shanghai	5760	1405	7165	4	2	28	34
	Newark	5760	2698	8458	4	2	34	40
Durban	Rotterdam	5760	1830	7590	7	3	25	35
	Shanghai	5760	1156	6916	7	3	34	44
	Newark	5760	3630	9390	7	3	31	41
Dar es Salaam	Rotterdam	5440	2057	7497	12	21	30	63
	Shanghai	5440	867	6307	12	21	38	71

Note: Total of transportation cost=trucking cost (one vehicle) plus ocean freight (TEU); hence unit is different with each other.

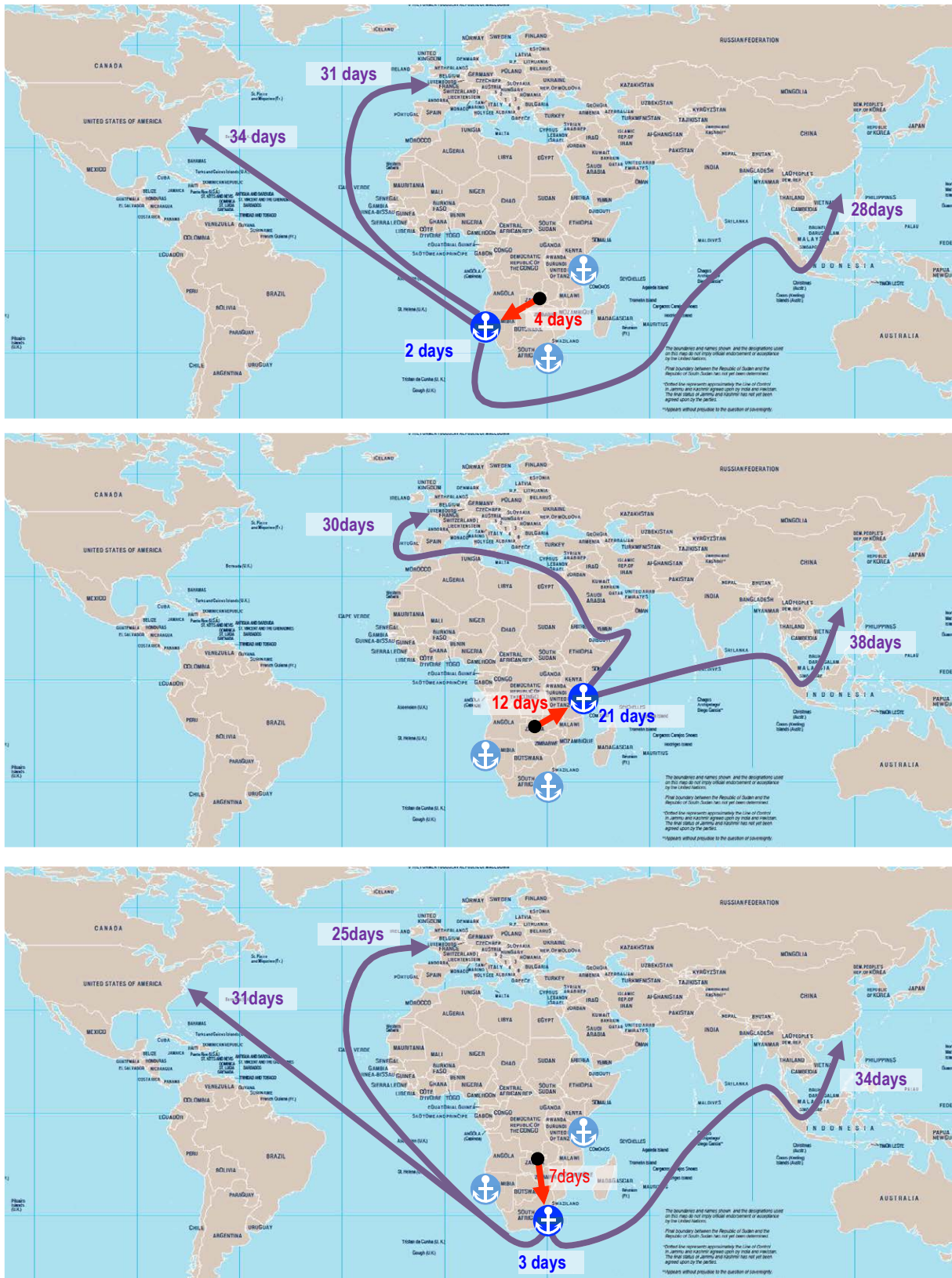
Source: JICA Study Team

4. Logistics Network in SADC and Namibia



Source: JICA Study Team based on interviews with logistics companies.

Figure 4.29: Estimated transportation cost



Source: JICA Study Team based on interview with logistics companies.

Figure 4.30: Estimated transit time

4.2.5 Positioning Namibia: implications of regional cargo flow, shipping service, and port facility

4.2.5.1 Cargo volume and flow

Rapid growth of cargo handling volume at Walvis Bay Port depends on transshipment demand. 60% of the cargo handled at the port is transhipped to other countries in West Africa, in particular, Angola. It is quite likely that direct cargo for Angola will increase and demand for transshipment at Walvis Bay will decrease overtime. Therefore, it is important for Walvis Bay Port to increase the cargo for inland countries that currently accounts for 20 %. It should be also be noted that the cargo for inland countries is not only in the form of transit transportation, but also a large portion of the cargo is in the form of re-export to inland countries, most typically such cargo re-exported to inland countries after customs clearance at the port of Durban and City Deep of Johannesburg. The reason and the system of the re-export should be further analysed to find a way to increase the cargo for inland countries through Walvis Bay.

As for truck transportation, it is a notable characteristic of Namibia that the majority of trucking companies have profiles of close business relationships with South Africa and thus handles a lot of traffic with South Africa. On the other hand, only a few trucking companies operate the service for inland countries and thus traffic volume to and from inland countries is insignificant. There is no significant supplier of services for transporting cargo for inland countries. Henceforth, it is important to explore measures to increase the supply of trucks in case demand for transit cargo for inland countries is strategically generated and need to respond to it quickly on short notice.

As for airborne cargo in SADC, OR Tambo Airport in Johannesburg handles the majority of volume and acts as hub airport in southern Africa. The cargo once landed at OR Tambo Airport is mostly forwarded to final destinations via land transportation and rarely transferred via air except for “air courier”. Airports in Namibia handle a very small volume of cargo now. It is, however, expected that an increase in seaborne cargo will induce an increase in airborne cargo and air passengers. It is important to identify a context and magnitude of links between seaborne cargo and air transportation, and to prepare a viable plan to utilize the airports.

4.2.5.2 Shipping service

The frequency of shipping services at Walvis Bay Port is the second highest following the port of Durban in southern Africa. Thanks to its relatively new role as a transshipment hub for West Africa, Walvis Bay Port is not a “low frequency port” anymore as much as many people in international logistics business still remember as it was five years ago. At the same time, the present frequency is not good enough for many clients to shift their operation from Durban routes to Walvis Bay routes.

Walvis Bay is still a “once a week for each direction” port when it is compared with a “daily service to anywhere” port of Durban.

Aside from this emerging role as a transshipment port, Walvis Bay has its natural geographical advantage, which is to be the first and last port between southern Africa and Europe or North America.

However, this advantage is not yet fully exploited. There is only one shipping company, MACS, providing a direct service for Europe and North America. It is strategically more and more important for Walvis Bay Port to get a direct service for Europe and North America in order to use its natural advantage and differentiate its role from the other gateways, especially Durban-Johannesburg.

4.2.5.3 Port facility

Walvis Bay Port has a physical advantage. It has a -14 metres deep container terminal and a new container terminal with -16m quays is under construction to be completed in 2017. Gateway ports in the other countries are either along a river or within a narrow bay and thus have very limited room for expansion.

The ports in other countries, however, also have ambitious development plans to expand their capacity by the development of new areas outside the current ports, on average around 2020. Thus, within 6-7 years time, competition among regional gateway ports will be expected to be very stiff. Given these expected improvements of the ports, it will be more critical for users to compare different gateways not only in terms of physical capacity of a port, but as a package of international logistics services to link a port and its hinterland when they decide which gateway to use. Hence Namibia needs to be prepared to transform itself as a complete package of logistics services, especially to transform Walvis Bay Port from the present “transshipment dependent port” to a “gateway/ supply depot for inland SADC”. This requires the development of supporting infrastructure, including provision of a large space for logistics business within the port area (especially warehouses for value addition), road development around the port, and dredging of the channel etc.

As for the operation of container terminals, other ports in SADC are pursuing PPP options. The ports in Namibia also need to explore proactively ways to use PPP quickly and wisely.

4.2.5.4 Cost and transit time

Walvis Bay Port seems to have a cost advantage over Durban in terms of land transport when compared regarding of one-way cargo. In practice, however, the trucking cost is significantly reduced if there is return cargo. It is often noted that the trucking cost of Walvis Bay becomes high due to the fact that it is not easy to find return cargo in Walvis Bay unlike in Durban or Johannesburg where return cargo is often readily available. Hence Walvis Bay corridors need to increase not only total throughput but also availability of return cargo at the ends of the corridors (ie. Walvis Bay and

Lusaka/Kitwe). This is one of the key elements required to reduce the trucking cost of linking the port and hinterland (inland SADC).

4.3 Demand for logistics services in Namibia

In section 4.2, the situation of Namibia in SADC is reviewed by comparing it with other major gateways and corridors. In this section, a focus is put more on Namibia itself. It is necessary to analyse trade and transport data in order to illustrate the demand structure of logistics services (market segments) in Namibia.

4.3.1 Analysis of international trade data of Namibia

For the analysis of trade data of Namibia and other countries, the terms and phrases in this section are defined as follows:

- Trade or international trade consists of import and export, and exclude transit and transshipment.
- Transit is through cargo such as a cargo landed at Walvis Bay and transported by truck to Zambia directly. Basically, transit cargo is accounted as trade between country of origin and country of final destination in the statistics.
- Transshipment is cargo transferred from vessel to vessel at a way port in order to reach the final destination stated on the Bill of Lading (B/L).

Basically, trade statistics are based on the customs declaration data; therefore, classification of commodity or goods in the trade statistics should be in accordance with “Harmonized Commodity Description and Coding System (HS code)”. For convenience of analysis of trade data, the study team defined thirty commodity classes as shown in Table 4.29 based on four digit HS code taking account of major commodities of Namibian trade.

Table 4.29: Commodity class and HS code

No.	Commodity	HS code (2 digits or 4 digits)
1	Live Animals, Meat & Edible Meat Offal	01 (Live Animals), 02 (Meat & Edible Meat Offal)
2	Fish and Crustaceans	03 (Fish & Crustaceans)
3	Vegetable and Fruits	07 (Edible Vegetables), 08 (Ed. Fruits & Nuts, Peel Of Citrus/Melons)
4	Prepared Foodstuffs	04 (Dairy, Eggs, Honey, & Ed. Products), 15, 16, 18-21
5	Beverage	22 (Beverages, Spirits & Vinegar)
6	Cereals & Milling Industry Products	10 (Cereals), 11 (Milling Industry Products)
7	Animal Feed	12 (Oil Seeds/Misc. Grains/Med. Plants/Straw), 23 (Residues From Food Industries, Animal Feed)
8	Sugars & Sugar Confectionery	17 (Sugars & Sugar Confectionery)
9	Other Agricultural Products	05, 06, 09, 12-15, 41
10	Fertilizer	31 (Fertilizers)
11	Petroleum, Oil and Gas	2709 - 2713
12	Copper ores and concentrates	2603 (Copper Ores and Concentrates)
13	Zinc ores and concentrates	2608 (Zinc Ores and Concentrates)
14	Manganese ores and concentrates	2602 (Manganese Ores and Concentrates)
15	Coal	2701 - 2708
16	Salt	2501 (Salt and Pure Sodium Chloride, Whether or not Cont.)
17	Marble, Fluorspar	2515 (Marble, Travertine Etc. And Alabaster, Crude Etc.) -2516
18	Diamonds and other precious stones, ore	71 (Pearls, Stones, Prec. Metals, Imitation Jewellery, Coins)

No.	Commodity	HS code (2 digits or 4 digits)
19	Other Ore, Slag, Stone and Sand	25 (Salt, Sulphur, Earth & Stone, Lime & Cement), 26 (Ores Slag & Ash)
20	Metal and Metal Products	72-76, 78-81
21	Chemicals and Industrial Material	15,28,29, 32-36, 38,39, 40,42,43,68,70
22	Garment, Textiles and fabric	42,43,50-67
23	Wood and Wood Products	44 (Wood & Articles of Wood, Wood Charcoal), 45,46
24	Paper and Printed Matter	47 (Pulp of Wood, Waste & Scrap of Paper), 48, 49
25	Cement, Construction Material	25, 27, 39, 68, 69, 94
26	Household articles, Pharmaceutical products	24, 30, 33, 34, 36, 37, 39, 69, 70, 73, 74, 76, 82-85, 87, 91,92, 94-96
27	Passenger Car, Truck, Motorcycle	8426-8427, 8701-8705,8711,8716
28	Rail locomotive, coaches, Aircraft and Vessel	86 (Railway or Tramway Locomotives, Rolling Stock, Track Fixtures & Fittings, Signals), 87, 88
29	Machinery and Parts	84, 85, 87-92
30	Other unclassified goods	93, 95, 97, 98

Note: Actual correspondence table correspond to little less than 6,000 commodities by four digits HS code.
Source: JICA Study Team

4.3.1.1 International trade in SADC: a background of market segments for logistics services in Namibia

International trade, namely, export and import of goods in SADC countries is dominated by South Africa and Angola. Major export items of South Africa in 2012 are precious stones, metals (22% of total export value of South Africa), ores, slag and ash (15%) mineral fuels, oils, distillation products (11%), while major import items are machinery, electronic equipment and vehicles (33%) and mineral fuels, oils, distillation products (22%). Export of Angola in 2012, according to International Trade Centre, is dominated by mineral fuels, oils, distillation products (98%), and major import commodities are machinery, electronic equipment and vehicles (34%), articles of iron or steel (5%) and mineral fuels, oils, distillation products (5%). Namibia is average in SADC countries regarding international trade value in 2012.

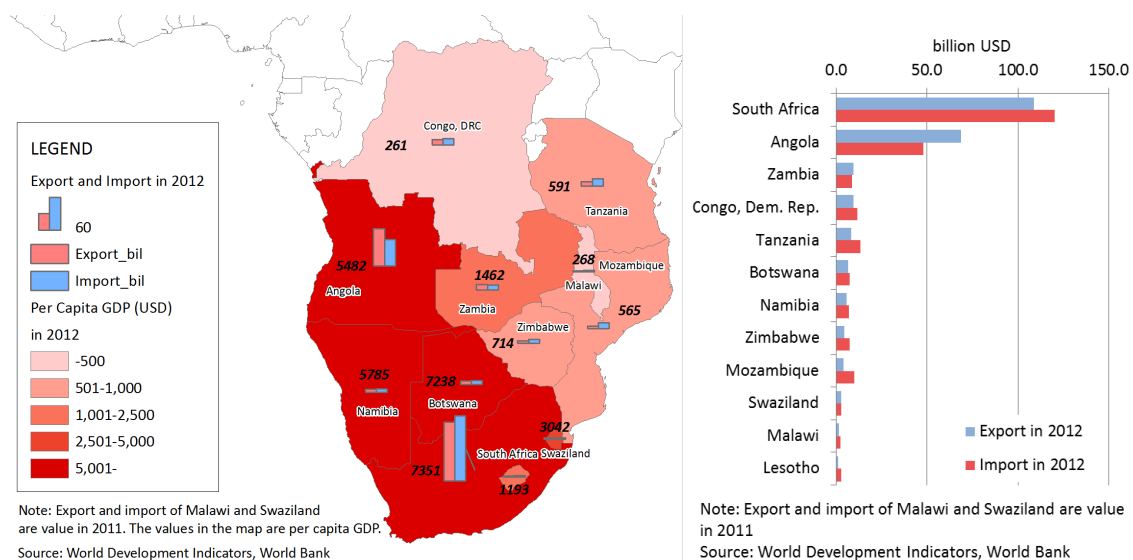


Figure 4.31: GDP per capita and trade value in 2012

International trade flow based on “UN ComTrade” is shown in Figure 4.32. Export and import

between South Africa and other continents such as Asia, Europe and America are remarkable, and international trade between SADC countries is considerably lower than trade with other continents.

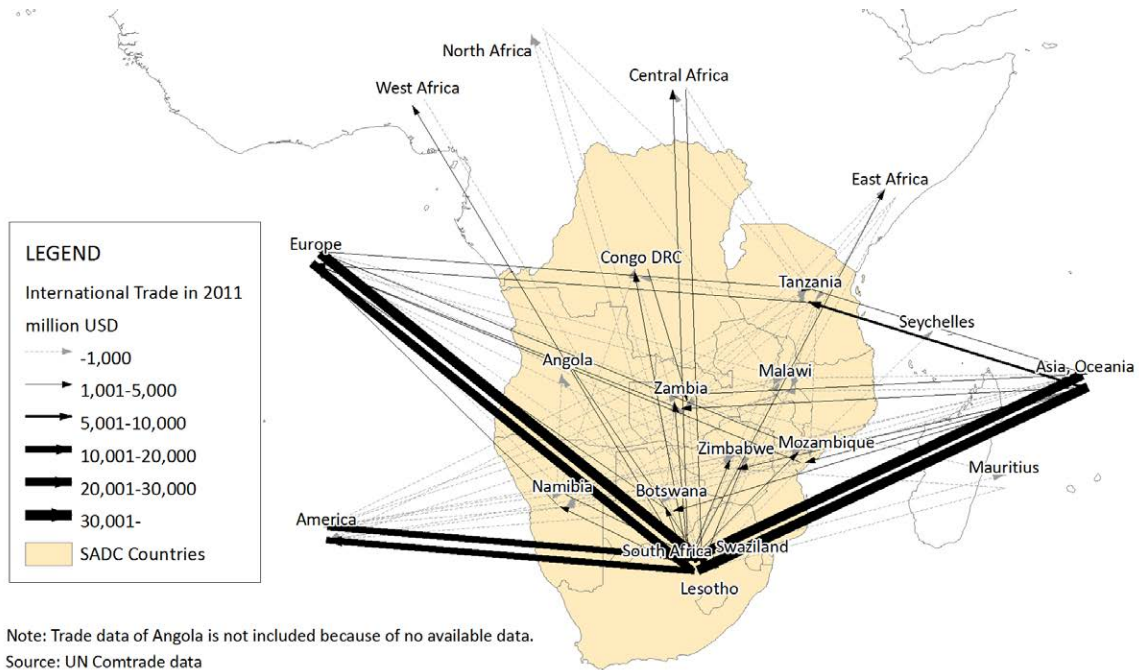


Figure 4.32: International trade value in SADC

Figure 4.33 illustrates international trade excluding trade with other continents relevant to SADC countries. From trade by value in 2011, significant international trade is between South Africa and Namibia, Botswana and Zimbabwe in terms of value. In terms of weight of commodity, trade between South Africa and Mozambique, Angola and Central Africa is significant.

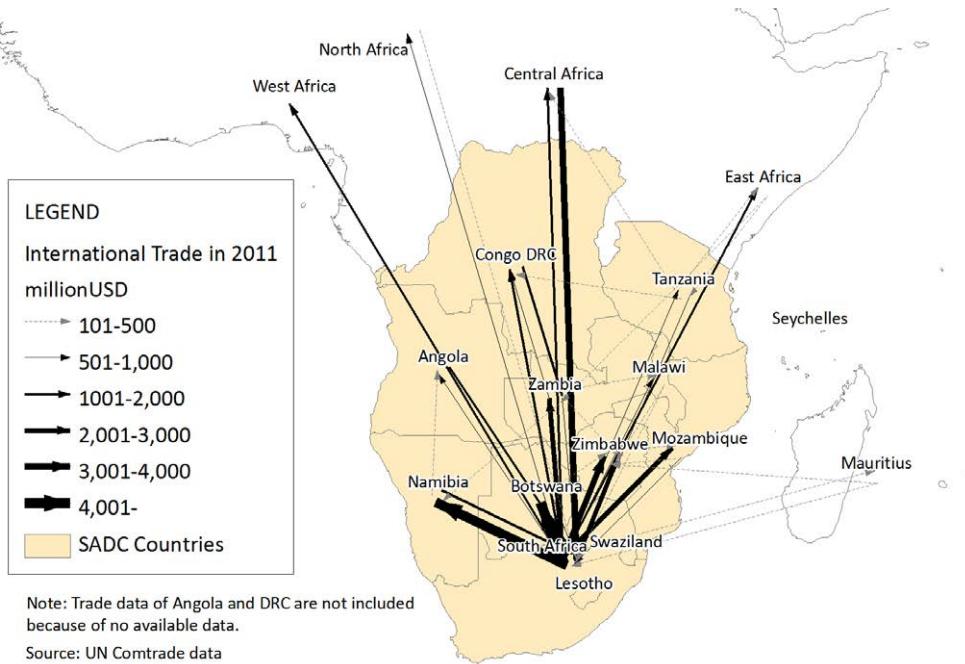


Figure 4.33 International trade value of SADC countries within Africa

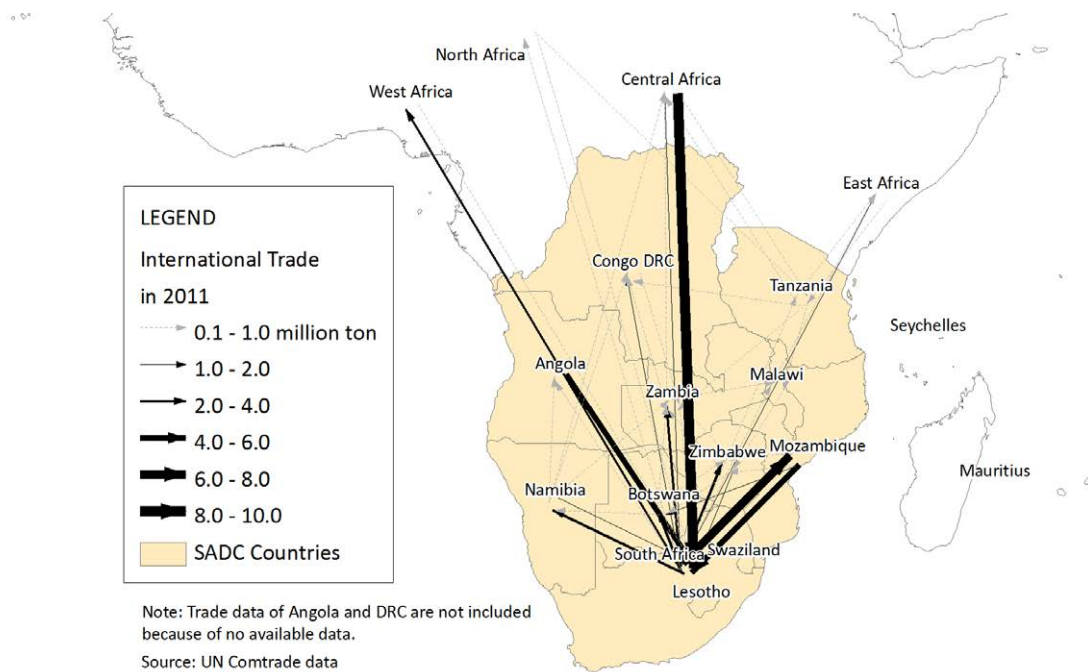
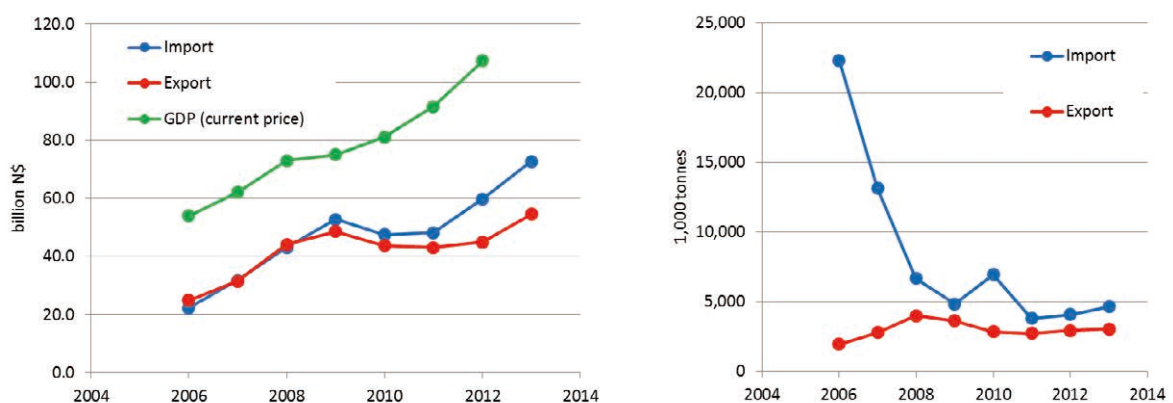


Figure 4.34: International trade volume of SADC countries within Africa

4.3.1.2 International trade in Namibia

Figure 4.35 illustrates the international trade in Namibia from 2006 to 2013 excluding transit and trans-shipment. In 2013, the export and import value in Namibia reached 54.5 billion and 72.7 billion N\$ respectively, and average annual growth rates were 11.9% and 18.4% respectively. In terms of trade volume in weight, import volume from 2006 to 2009 has decreased because of reduction of import of cement, animal feed such as wheat and maize.

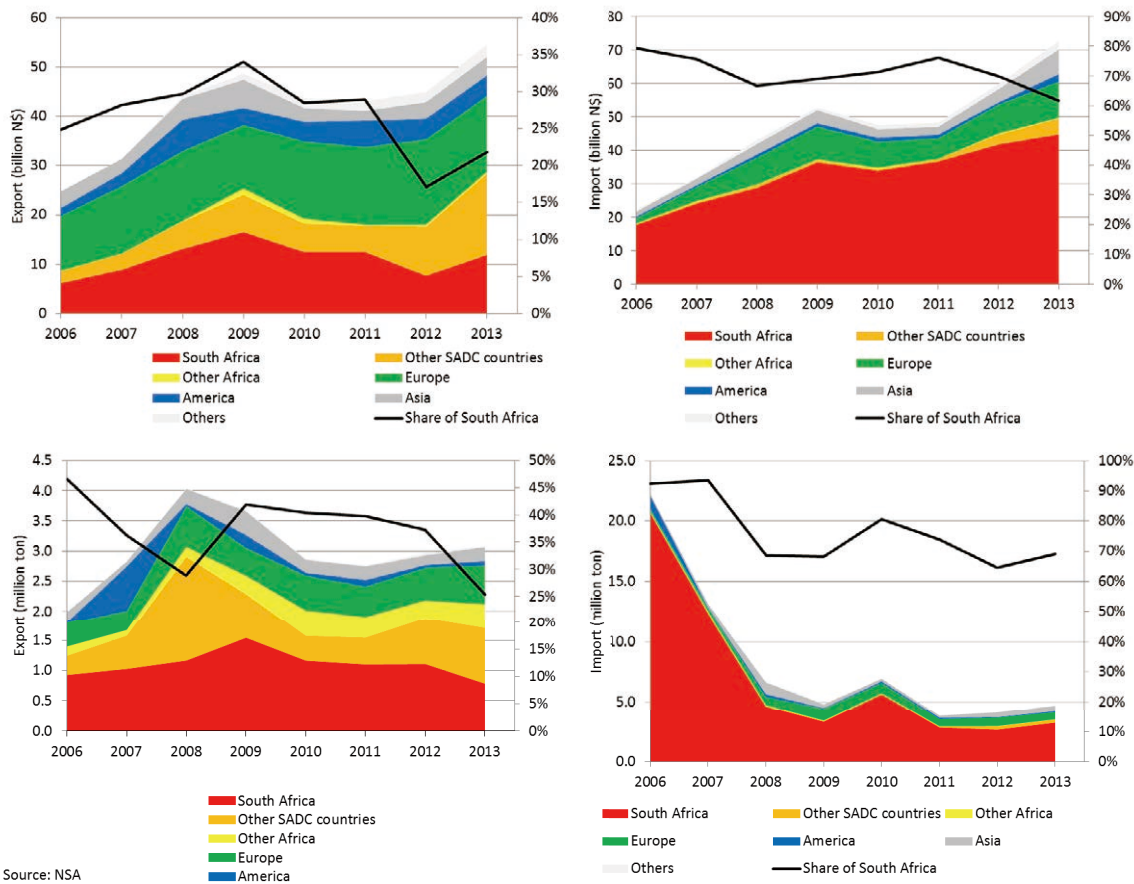


Source: NSA

Figure 4.35: International trade value and volume of Namibia in 2006–2013

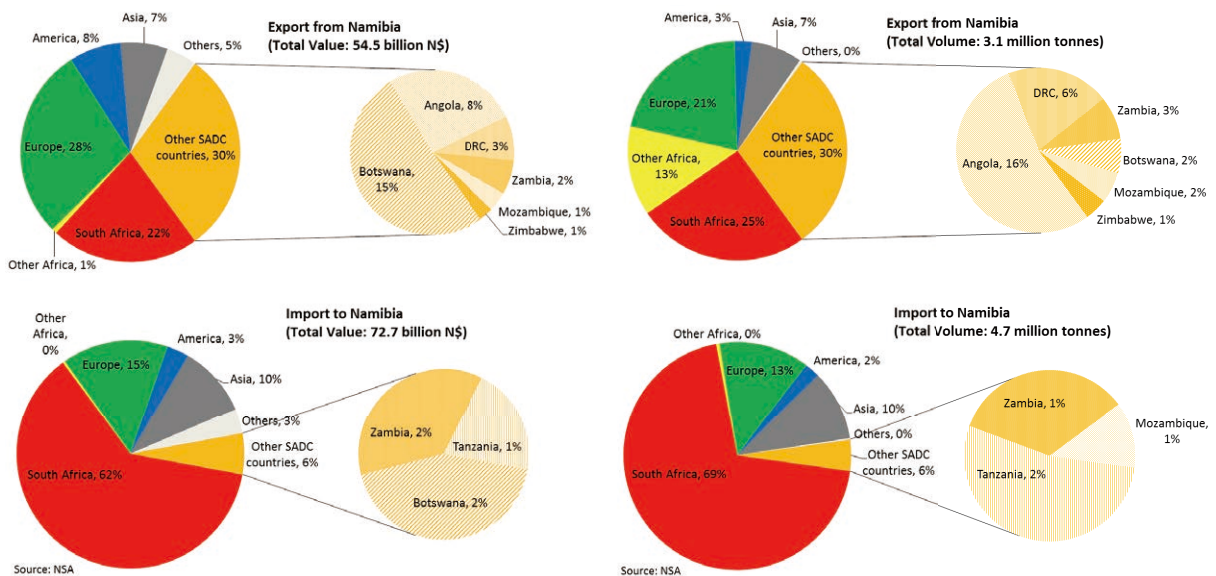
South Africa is the most important trading partner for Namibia, which accounts for 62% of Namibian import and 22% of export in terms of value in 2013. However, the South African share in Namibian

trade has decreasing since 2006 because of expansion of multilateral trade of Namibia especially trade with other SADC countries such as Angola and Botswana since 2009.



Source: NSA

Figure 4.36: Export and import of Namibia by partners (upper: value, lower: weight)



Source: NSA

Figure 4.37: Proportion of Nambian trade partner in 2013

Major export items of Namibia in 2013 in terms of trade value are:

- “Diamonds and other precious stones, ore” (N\$ 13.4 billion and 25% of total export value),
- “Fish and crustaceans” (N\$ 7.1 billion, 13%),
- “Other ore, slag, stone and sand” except copper, zinc and manganese ore (N\$ 6.8 billion, 12%), and
- “Machinery and parts” (N\$ 6.8 billion, 12%) includes “floating or submersible drilling or production platforms” (N\$ 3.0 billion, 5% of total export value).

Major import items in 2013 in terms of trade value are:

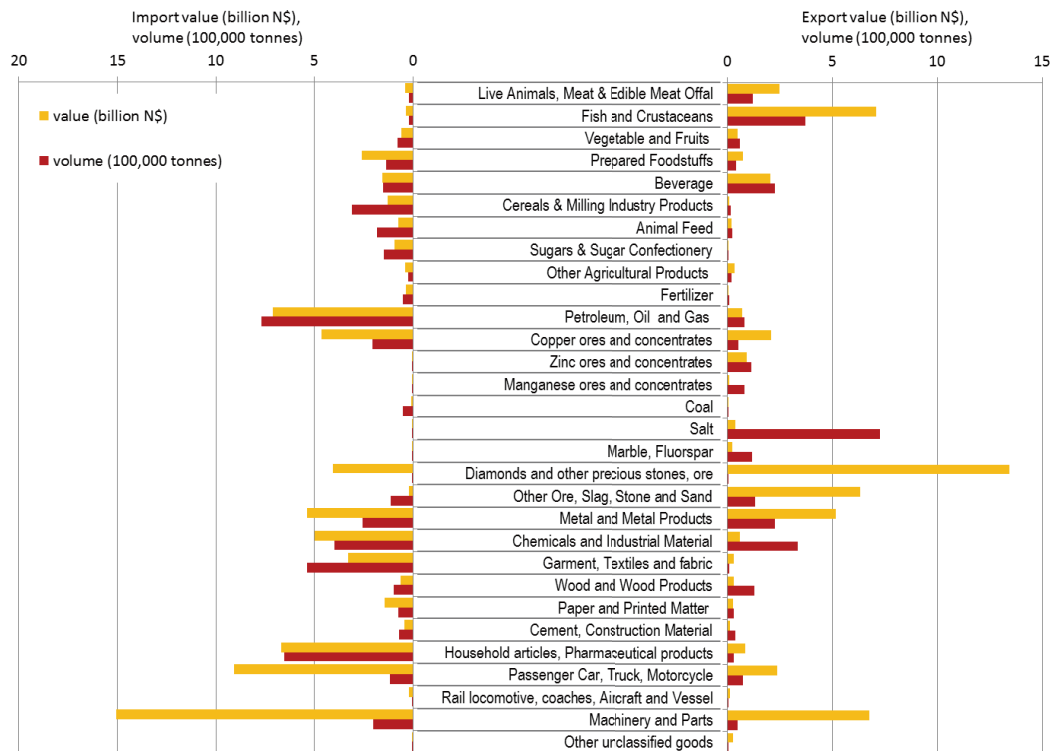
- “Machinery and parts” (N\$ 15.0 billion and 21% of total import value),
- “Passenger car, truck, motorcycle” (N\$ 9.1 billion, 12%), and
- “Petroleum, oil and gas” (N\$ 7.1 billion, 10%).

Major export items by weight are:

- “Salt” (725,000 tons and 24% of total export volume), to central Africa, especially Nigeria, South Africa and Europe,
- “Fish and crustaceans” (372,000 tons, 12%) to Europe, Congo DRC and South Africa, and
- “Chemicals and industrial material” (332,000 tons, 12%) including “disodium carbonate” (286,000 tons, 9% of total export volume) to Angola and South Africa.

In terms of weight, major import items in 2013 are:

- “Petroleum, oil and gas” (770,000 tons and 16% of total import volume) from South Africa, Europe and Tanzania,
- “Household articles, pharmaceutical products” (653,000 tons, 14%) from South Africa, and
- “Garment, textiles and fabric” (538,000 tons, 11%) from South Africa.



Source: NSA

Figure 4.38: Export and import volume and value of Namibia in 2013

Figure 4.39 and Figure 4.40 show the export and import value and volume by customs in Namibia in 2013 excluding transit cargo through Namibia and transshipment at the port. Three major customs offices, Walvis Bay, Trans Kalahari and Ariamsvlei accounted for more than half the total export and import of Namibia. Especially, Walvis Bay accounts for 47% of exports and 31% of imports of Namibia in terms of commodity weight. Major export items at Walvis Bay are “salt” (44% of export from Walvis Bay), “fish and crustaceans” (15%), “zinc ores and concentrates” (6%). Major import items are “petroleum, oil and gas” (44%), “chemicals and industrial material” (17%) such as sulphuric acid and sodium hydrogen carbonate, and “sugars & sugar confectionery” (8%).

On the other hand, Trans Kalahari and Ariamsvlei that are borders on the Trans–Kalahari and Trans–Orange, respectively are import surplus. The trade volume through Ariamsvlei has been stable since 2006 and major imported items in 2013 are animal feed and maize. The trade volume through Trans Kalahari has increased since 2006 and major imported items through Trans–Kalahari in 2013 are maize and household articles such as cigarettes, glassware, detergent and soap.

On the contrary, Oshikango, the border with Angola is export surplus and major commodities exported are disodium carbonate, gravel, cement and maize.

Export and import volume through Katima Mulilo, the border with Zambia is comparatively small at present.

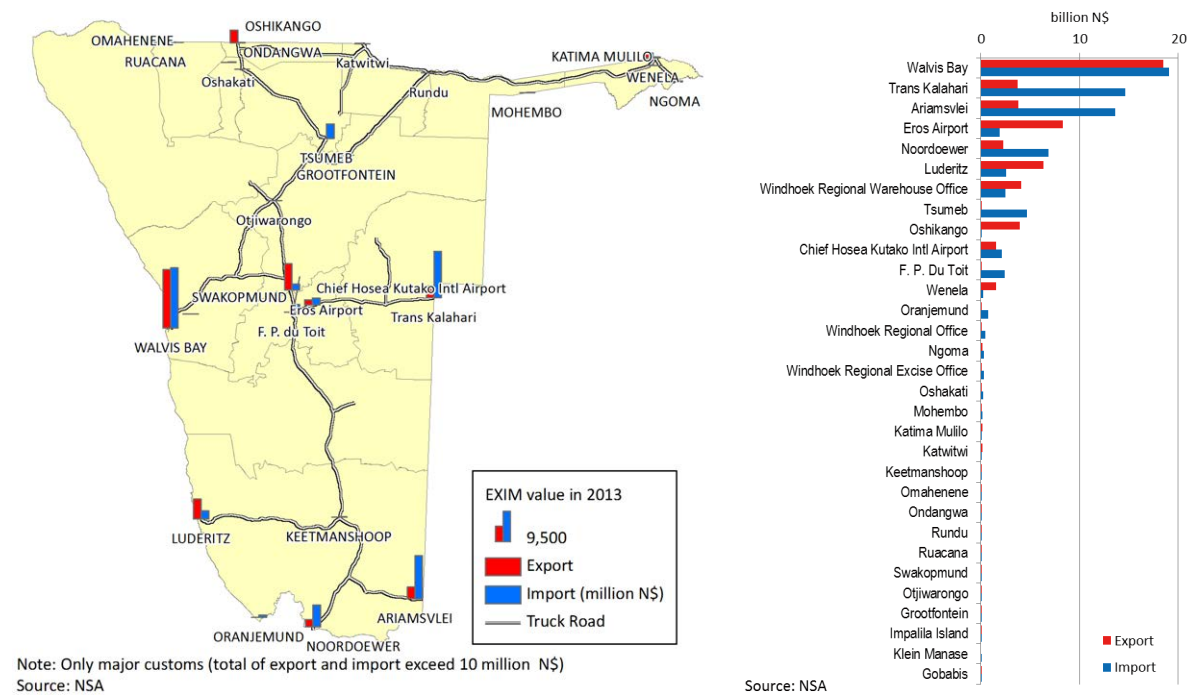


Figure 4.39: Export and import value by custom offices in 2013

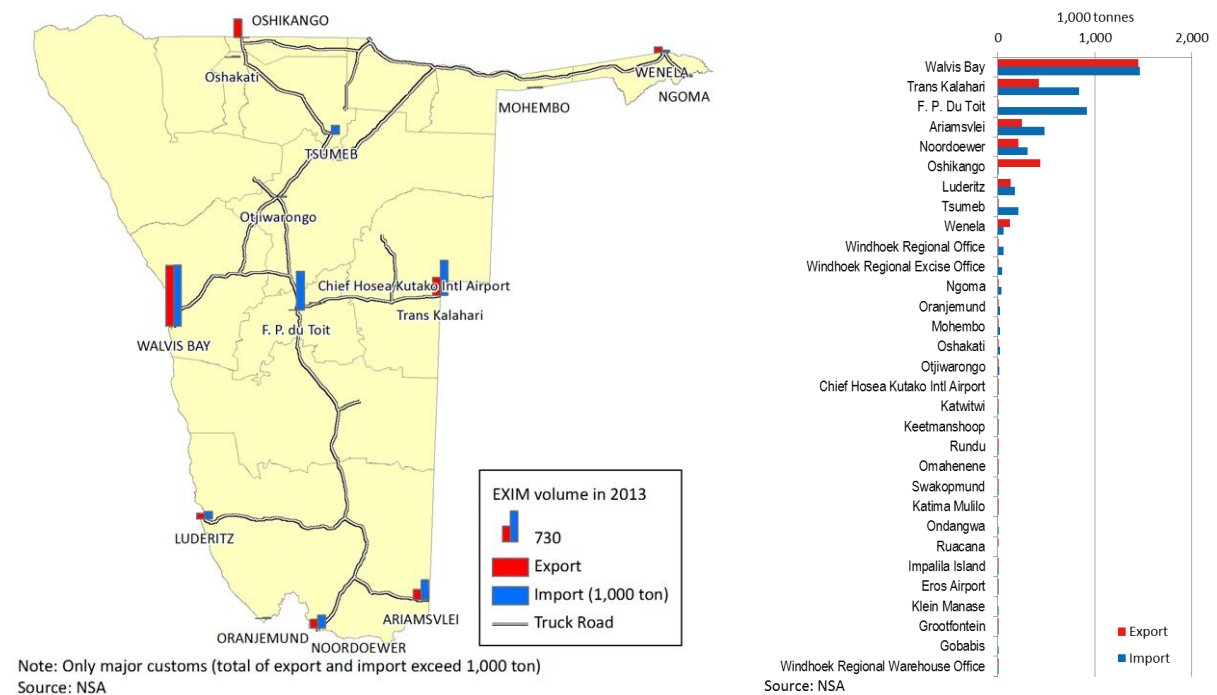


Figure 4.40: Export and import volume by custom offices in 2013

As shown in Figure 4.41, which indicates freight volume at major border customs offices, Katima Mulilio and Tsumeb have grown rapidly since 2009. Trade volumes at other customs points have remained flat.

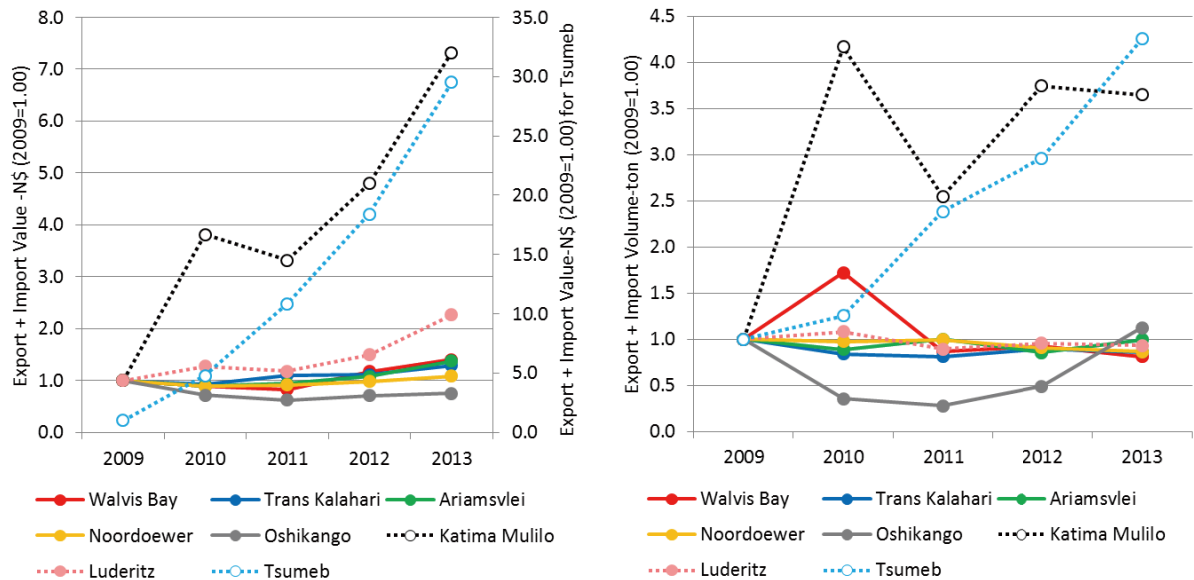


Figure 4.41: Change in export, import value and volume at major border customs points

Table 4.30: Major trade commodities at major customs offices in 2013

Customs Office	Export	(000 tons)	Import	(000 tons)
Walvis Bay	Export total	1,449.9 (100%)	Import total	1,461.9 (100%)
	Salt	633.6 (44%)	Petroleum, Oil and Gas	647.2 (44%)
	Fish and Crustaceans	215.3 (15%)	Chemicals and Industrial Material	253.3 (17%)
	Zinc ores and concentrates	90.7 (6%)	Sugars & Sugar Confectionery	121.3 (8%)
	Marble, Fluorspar	88.4 (6%)	Machinery and Parts	118.8 (8%)
	Manganese ores and concentrates	81.5 (6%)	Cereals & Milling Industry Products	102.1 (7%)
	Other Ore, Slag, Stone and Sand	61.7 (4%)	Coal	47.0 (3%)
	Metal and Metal Products	56.5 (4%)	Metal and Metal Products	41.6 (3%)
	Copper ores and concentrates	49.5 (3%)	Passenger Car, Truck, Motorcycle	22.1 (2%)
Trans Kalahari	Export total	424.2 (100%)	Import total	836.8 (100%)
	Beverage*1	142.9 (34%)	Household articles, Pharmaceutical products	162.6 (19%)
	Wood and Wood Products*2	42.2 (10%)	Cereals & Milling Industry Products	106.6 (13%)
	Passenger Car, Truck, Motorcycle	34.4 (8%)	Metal and Metal Products	106.3 (13%)
	Petroleum, Oil and Gas	33.6 (8%)	Chemicals and Industrial Material	63.7 (8%)
	Salt	28.9 (7%)	Beverage	49.6 (6%)
	Live Animals, Meat & Edible Meat Offal	24.2 (6%)	Wood and Wood Products	48.7 (6%)
Other Ore, Slag, Stone and Sand	21.2 (5%)	Prepared Foodstuffs	46.5 (6%)	
Ariamsvlei	Export total	248.6 (100%)	Import total	477.3 (100%)
	Live Animals, Meat & Edible Meat Offal	62.6 (25%)	Animal Feed	116.3 (24%)
	Salt	47.4 (19%)	Metal and Metal Products	55.7 (12%)
	Fish and Crustaceans	34.5 (14%)	Passenger Car, Truck, Motorcycle	43.4 (9%)
	Metal and Metal Products	33.7 (14%)	Chemicals and Industrial Material	40.6 (8%)
	Wood and Wood Products	15.2 (6%)	Wood and Wood Products	31.1 (7%)
Noordoewer	Export total	208.6 (100%)	Import total	307.3 (100%)
	Vegetable and Fruits *3	36.4 (17%)	Prepared Foodstuffs	46.8 (15%)
	Wood and Wood Products*4	35.1 (17%)	Metal and Metal Products	32.7 (11%)
	Live Animals, Meat & Edible Meat Offal	24.6 (12%)	Vegetable and Fruits	32.3 (11%)
	Chemicals and Industrial Material	23.4 (11%)	Chemicals and Industrial Material	29.2 (10%)
	Metal and Metal Products	19.6 (9%)	Cereals & Milling Industry Products	21.7 (7%)
	Salt	11.8 (6%)	Paper and Printed Matter	18.4 (6%)
Fish and Crustaceans	10.9 (5%)	Household articles, Pharmaceutical products	16.2 (5%)	
Luderitz	Export total	133.2 (100%)	Import total	173.6 (100%)
	Metal and Metal Products	90.0 (68%)	Other Ore, Slag, Stone and Sand	91.1 (52%)
	Zinc ores and concentrates	21.0 (16%)	Petroleum, Oil and Gas	69.8 (40%)
	Fish and Crustaceans	10.2 (8%)	Metal and Metal Products	5.5 (3%)

Customs Office	Export	(000 tons)	Import	(000 tons)
F. P. Du Toit	Export total	0.0	Import total	917.8 (100%)
	-	-	Garment, Textiles and fabric	486.9 (53%)
	-	-	Household articles, Pharmaceutical products	418.7 (46%)
Oshikango	Export total	440.4 (100%)	Import total	3.5 (100%)
	Chemicals and Industrial Material	289.0 (66%)	Beverage	2.3 (66%)
	Other Ore, Slag, Stone and Sand	33.1 (8%)	-	-
	Household articles, Pharmaceutical products	16.4 (4%)	-	-
Tsumeb	Export total	0.7	Import total	209.2 (100%)
	-	-	Copper ores and concentrates	207.1 (99%)

Note: *1 Dominated by beer made from malt; *2 Dominated by wood charcoal; *3 Dominated by fresh grapes; *4 Fuel wood, wood charcoal

Source: NSA

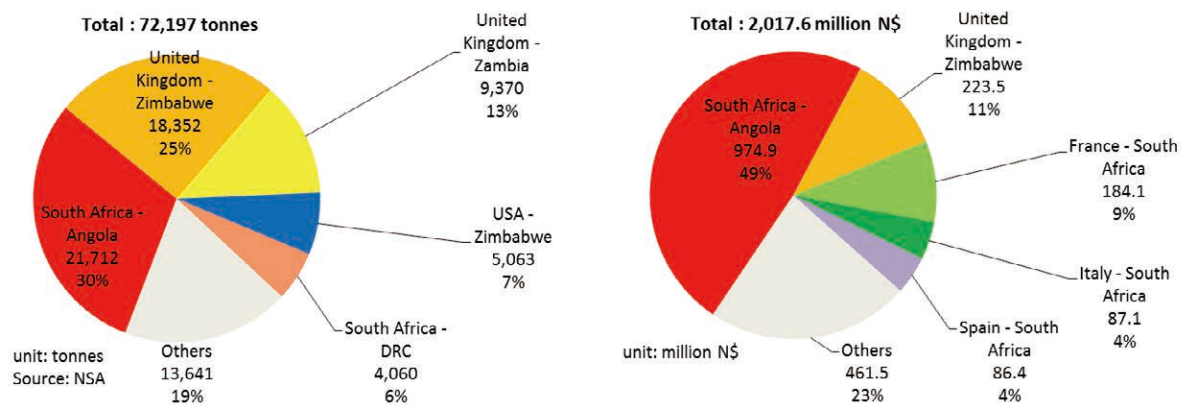
4.3.1.3 Transit cargo through Namibia

There are two existing sets of statistics relevant to transit cargo through Namibia, customs data provided by NSA and cross-border cargo relevant to Walvis Bay Port provided by Namport.

- Transit cargo based on customs data excludes some items such as transit of refined copper from Zambia to sea through Walvis Bay Port.
- Walvis Bay Port data includes only transit cargo relevant to Walvis Bay Port and excludes other transport corridors such as transit from South Africa to Angola.

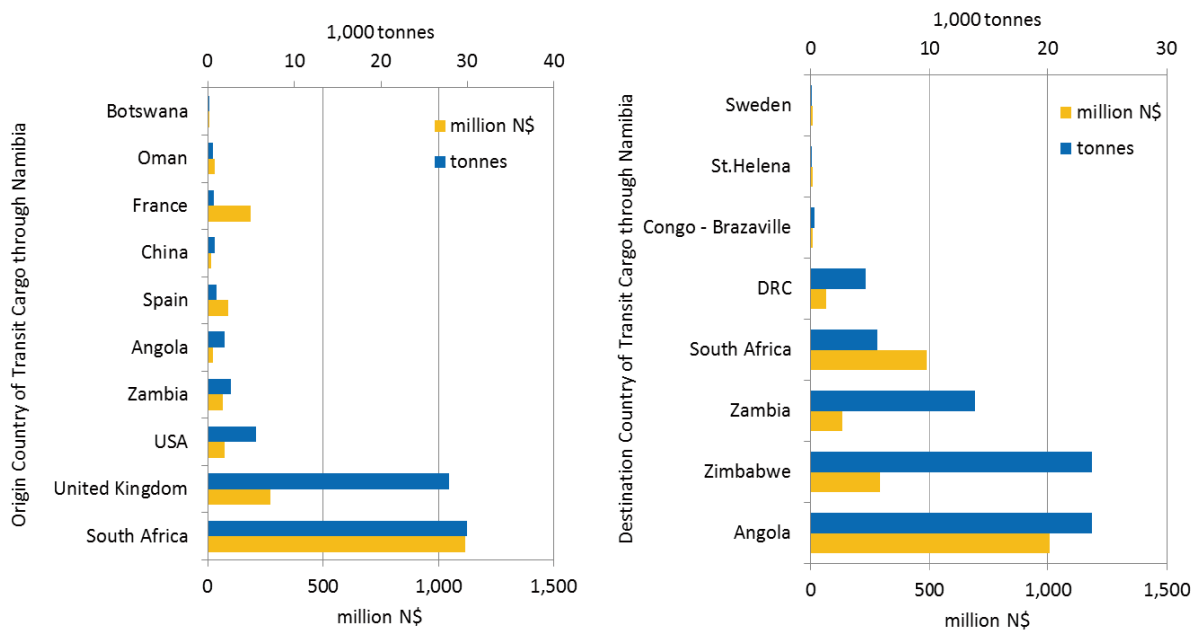
Transit cargo by customs database

As shown in the following figures, major transit cargo through Namibia is cargo from South Africa to Angola in terms of weight (30% in 2013) and United Kingdom to Zimbabwe (25%) and Zambia (13%). On the other hand, in terms of value of cargo, the share of transit cargo from South Africa to Angola is 48% and cargo from Europe to southern Africa is significant.



Source: NSA

Figure 4.42: Transit cargo by origins and destinations in 2013



Source: NSA

Figure 4.43: Transit volume by origin and destination country in 2013

The commodity of transit cargo is, as shown in Figure 4.44, Table 4.31 and Table 4.32, dominated by motor vehicles from the United Kingdom to Zimbabwe and Zambia in terms of weight.

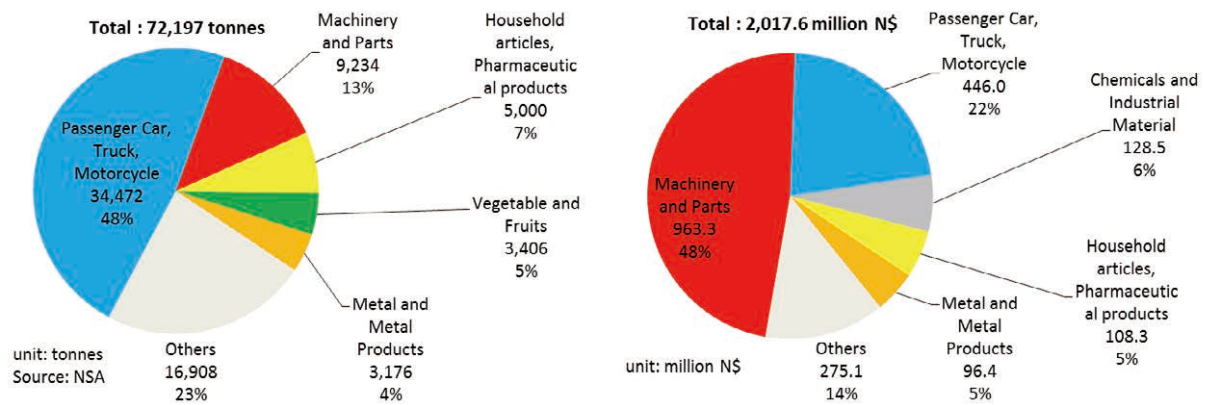


Figure 4.44: Transit cargo by commodity in 2013 based on customs data

Table 4.31: Major transit volume by commodity and origins and destination in 2013

Origins	Destinations	Commodity by HS4digits	Volume (tons)	Share
United Kingdom	Zimbabwe	Motor Vehicles For Transport Of Goods	6,083	8%
United Kingdom	Zimbabwe	Motor Cars & Vehicles For Transporting Persons	5,850	8%
United States	Zimbabwe	Tractors (Other Than Works Trucks) Of Heading 8709	4,455	6%
United Kingdom	Zambia	Motor Vehicles For Transport Of Goods	4,182	6%
United Kingdom	Zimbabwe	Tractors (Other Than Works Trucks) Of Heading 8709	3,022	4%
Others			52,320	69%
Total			75,912	100%

Source: NSA

Table 4.32: Major transit value by commodity and origins and destination in 2013

Origins	Destinations	Commodity by HS4digits	Value (N\$ million)	Share
South Africa	Angola	Parts & access for motor vehicles	452.5	22.4%
France	South Africa	Machinery, plant or laboratory equipment, whether or not electrically heated, for the treatment of materials by a process involving a change of temperature such as heating, cooking, roasting, distilling, rectifying, sterilising, and pasteur	217.4	10.8%
United Kingdom	Zimbabwe	Motor cars & vehicles for transporting persons	184.1	9.1%
Italy	South Africa	Steam turbines & other vapour turbines, parts	113.8	5.6%
Spain	South Africa	Steam or other vapour generating boilers (other than central heating hot water boilers capable also of producing low pressure steam); super-heated water boilers.	97.1	4.8%
Others			952.7	47.2%
Total			2,017.6	100.0%

Source: NSA

Cross-border cargo relevant to Walvis Bay Port

Table 4.33 shows the cross-border cargo relevant to Walvis Bay Port. Transit cargo by land transport from other neighbouring SADC countries to Walvis Bay Port for shipping was about 63,455 tons in 2013 (243 tons/day) and transit cargo landed at Walvis Bay Port and transported to other neighbouring SADC countries was larger than the opposite direction by far, 554,017 tons in 2013 (2,125 tons/day). Average annual growth rates of transit cargo from other SADC countries to Walvis Bay Port in 2010-2013 was 17.9% and transit cargo from Walvis Bay Port to other SADC countries was 20.6%.

Table 4.33: Annual cross-border cargo to/from Walvis Bay Port

Year	From other SADC countries to Walvis Bay Port				From Walvis Bay port to other SADC countries			
	12m container (Nos)	6m container (Nos)	Bulk (ton)	Total (ton)	12m container (nos)	6m container (nos)	Bulk (ton)	Total (ton)
2009	6	268	62	5,614	2,915	757	8,680	117,100
2010	69	1,823	96	38,764	7,025	2,138	48,496	316,056
2011	42	1,890	143	39,287	5,920	2,584	145,656	386,776
2012	89	2,578	2,912	57,320	7,976	2,964	231,690	546,202
2013	119	2,968	287	63,455	8,569	2,956	220,689	554,017

Note: Total ton is based on the assumption that content of 12m (40ft) container is 32 ton, 6m (20ft) container is 20 ton.

Source: Namport

Major transit cargo landed at Walvis Bay Port and transported to other countries by land-transport are cars for Zimbabwe (21%) and Zambia (12%), machinery and parts for Angola (14%).

Table 4.34: Transit cargo from Walvis Bay Port to SADC countries in 2013

Unit: 1,000 tons

	Angola	DRC	South Africa	Zambia	Zimbabwe	Others	Total
Passenger Car, Truck, Motorcycle	3.5 (1%)	2.7 (0%)	0.2 (0%)	65.4 (12%)	118.0 (21%)	31.5 (6%)	221.3 (40%)
Machinery and Parts	78.4 (14%)	2.0 (0%)	0.3 (0%)	11.6 (2%)	2.8 (1%)	2.3 (0%)	97.5 (18%)
General	33.4 (6%)	1.1 (0%)	1.1 (0%)	6.9 (1%)	0.4 (0%)	N/A N/A	42.8 (8%)
Household articles, Pharmaceutical products	37.2 (7%)	0.4 (0%)	0.0 (0%)	2.3 (0%)	0.5 (0%)	0.1 (0%)	40.5 (7%)
Live Animals, Meat & Edible Meat Offal	2.7 (0%)	18.8 (3%)	0.0 (0%)	3.6 (1%)	1.5 (0%)	0.2 (0%)	26.7 (5%)
Fish and Crustaceans	2.7 (0%)	8.8 (2%)	0.0 (0%)	12.6 (2%)	0.0 (0%)	0.0 (0%)	24.1 (4%)
Others	60.0 (11%)	6.7 (1%)	1.3 (0%)	32.3 (6%)	0.3 (0%)	0.5 (0%)	101.1 (18%)
Total	217.9 (39%)	40.4 (7%)	3.0 (1%)	134.7 (24%)	123.5 (22%)	34.4 (6%)	554.0 (100%)

Source: Namport

On the other hand, transit cargo transported from other SADC countries to Walvis Bay Port to load a ship is dominated by copper and concentrated copper from Zambia (59% and 7%) in 2013.

Table 4.35 Overland transit cargo from SADC countries to Walvis Bay Port in 2013

Unit: 1,000 tons

	Angola		Congo (DRC)		Malawi		South Africa		Zambia		Others		Total	
Copper	-	-	3.9	(6%)	0.1	(0%)	-	-	37.3	(59%)	-	-	41.3	(65%)
General	-	-	0.0	(0%)	0.1	(0%)	4.4	(7%)	0.4	(1%)	-	-	4.9	(8%)
Copper ores and concentrates	-	-	0.4	(1%)	-	-	-	-	4.3	(7%)	-	-	4.8	(7%)
Other Ore, Slag, Stone and Sand	-	-	-	-	2.3	(4%)	2.1	(3%)	0.2	(0%)	-	-	4.5	(7%)
Cement, Construction Material	-	-	-	-	-	-	1.7	(3%)	-	-	-	-	1.7	(3%)
Others	0.4	(1%)	0.3	(0%)	-	-	3.4	(5%)	2.0	(3%)	0.1	(0%)	6.2	(10%)
Total	0.4	(1%)	4.7	(7%)	2.5	(4%)	11.6	(18%)	44.2	(70%)	0.1	(0%)	63.5	(100%)

Source: Namport

Estimation of current transit

Table 4.36 shows a transit cargo volume between Walvis Bay Port and inland countries in 2013 calculated by data of Walvis Bay Port and customs database respectively. Transit cargo at Walvis Bay Port is only incoming/ outgoing from/to neighbouring SADC countries, and the weight of container cargo is calculated as 20 tons for 6 metres or 20feet container and 32 tons for 12 metres or 40feet container. Transit cargo volume by customs data consists of i) inbound, i.e., import from other continents to southern African countries, ii) outbound, i.e., export from other southern African countries to other continents, iii) transit cargo via overland transport, namely, regional freight flow in southern Africa through Namibia, and iv) unknown such as transit cargo from Angola to Angola or South Africa to South Africa.

The large difference of inbound/outbound transit cargo volume between statistics of Walvis Bay Port and customs data is a serious problem. To estimate current transit cargo flow through Namibia based on existing statistics and data,

- Statistics of Walvis Bay Port should be regarded as inbound and outbound transit cargo between SADC countries and other continents. However, some error such as minus value in the data should be fixed (*waiting for a response of Namport*).
- Transit cargo between SADC countries and other continents based on the customs database is significantly lower than statistics of Walvis Bay Port.
- Transit cargo in SADC region such as South Africa to Angola based on the customs database might be used as SADC regional transit flow if it can be checked and adjusted by AADT of heavy vehicle (*waiting for a response of Road Authority*).
- Current transit cargo flow through Namibia is estimated by cross-border cargo based on Namport's statistics, and regional overland transit cargo flow based on customs data.

Table 4.36: Transit cargo volume in 2013

Unit: tons

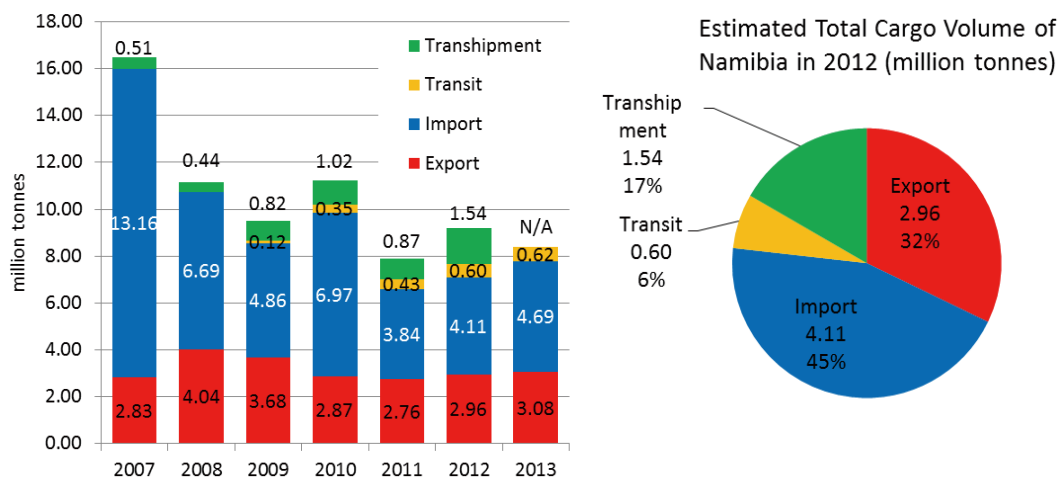
No	Commodities	Cross-border through Walvis Bay Port		Transit based on customs data			
		Inbound (landed at Walvis Bay Port)	Outbound (shipped at Walvis Bay Port)	Inbound (landed at Walvis Bay Port)	Outbound (shipped at Walvis Bay Port)	Transit transport	Unknown
1	Live Animals, Meat & Edible Meat Offal	26,740	84	79	0	176	
2	Fish and Crustaceans	24,114	192	389	0	108	
3	Vegetable and Fruits	64	0	2	0	3,404	
4	Prepared Foodstuffs	21,974	688	34	0	1,143	3
5	Beverage	1,108	80	15	0	1,233	70
6	Cereals & Milling Industry Products	936	40	1	0	296	
7	Animal Feed	52	0	0	0	113	
8	Sugars & Sugar Confectionery	153	9	0	0	151	
9	Other Agricultural Products	128	0	44	0	2,195	
10	Fertilizer	42	0	2	0	288	
11	Petroleum, Oil and Gas	5,023	0	26	0	645	120
12	Copper ores and concentrates	0	4,756	0	0		
13	Zinc ores and concentrates	0	0	0	0		
14	Manganese ores and concentrates	9	0	0	0		
15	Coal	0	0	0	0	0	
16	Salt	129	0	0	0	0	
17	Marble, Fluorspar	20	0	12	0	5	
18	Diamonds and other precious stones, ore	0	0	0	0	151	
19	Other Ore, Slag, Stone and Sand	0	4,532	0	0	1,353	
20	Metal and Metal Products	1,583	140	46	47	3,036	48
21	Chemicals and Industrial Material	15,928	1,020	365	36	420	19
22	Garment, Textiles and fabric	6,860	280	78	1	872	2
23	Wood and Wood Products (ex. Wood charcoal)	20,600	52	9	0	1,677	1
24	Paper and Printed Matter	15,108	0	6	1	1,472	1
25	Cement, Construction Material	4,768	1,720	0	0	3,144	8
26	Household articles, Pharmaceutical products	40,524	996	431	4	4,564	1
27	Passenger Car, Truck, Motorcycle	221,274	34	32,027	92	1,373	980
28	Rail locomotive, coaches, Aircraft and Vessel	0	0	27	0	117	
29	Machinery and Parts	97,463	1,109	3,743	66	5,168	257
30	Other unclassified goods	5,032	1,600	0	0	0	
98	General Cargo	43,230	4,899	-	-	-	-
99	Copper	1,540	41,328	-	-	-	-
	Total	554,401	63,559	37,338	247	33,102	1,510

Source: Cross-border through Walvis Bay Port is provided by Namport, Transit based on Customs Data is based on NSA.

4.3.1.4 Logistics flow in Namibia

Based on Namibian trade data as above, the composition of international freight volume relevant to Namibia is summarized in Figure 4.45³.

³ It should be noted, however, that following problems in data should be improved in order to more precisely illustrate



Note: Transshipment is based on fiscal year. Transit is based on Namport's statistics and only transit cargo through Walvis Bay Port.
 Source: Export and import are based on customs data provided by NSA; transit and transshipment is based on Namport statistics.

Figure 4.45: International Freight Volume relevant to Namibia

4.3.1.5 Potential of transit cargo through Namibia

In view of geopolitics and socio-economics such as population distribution, Zambia is one of the most important countries that has a potential of increasing transit cargo through Namibia.

As shown in Figure 4.46, major international trade partners of Zambia are Asia, South Africa and DRC in terms of weight. Zambian trade with Europe and America is smaller than with those regions but the import volume from Europe and America is 394 thousand ton (6.6 % of Zambia's total import) and export is 608 thousand ton (2.6% of Zambia's total export) in 2013.

context of demand for logistics service in Namibia: i) Transit cargo data provided by NSA excludes some transit cargo such as copper from Zambia and volume of almost all commodities is underestimated. Therefore it should be used for only SADC regional transit cargo with adjustment by cargo truck volume; ii) Transshipment cargo volume should be updated (waiting for a response of Namport).

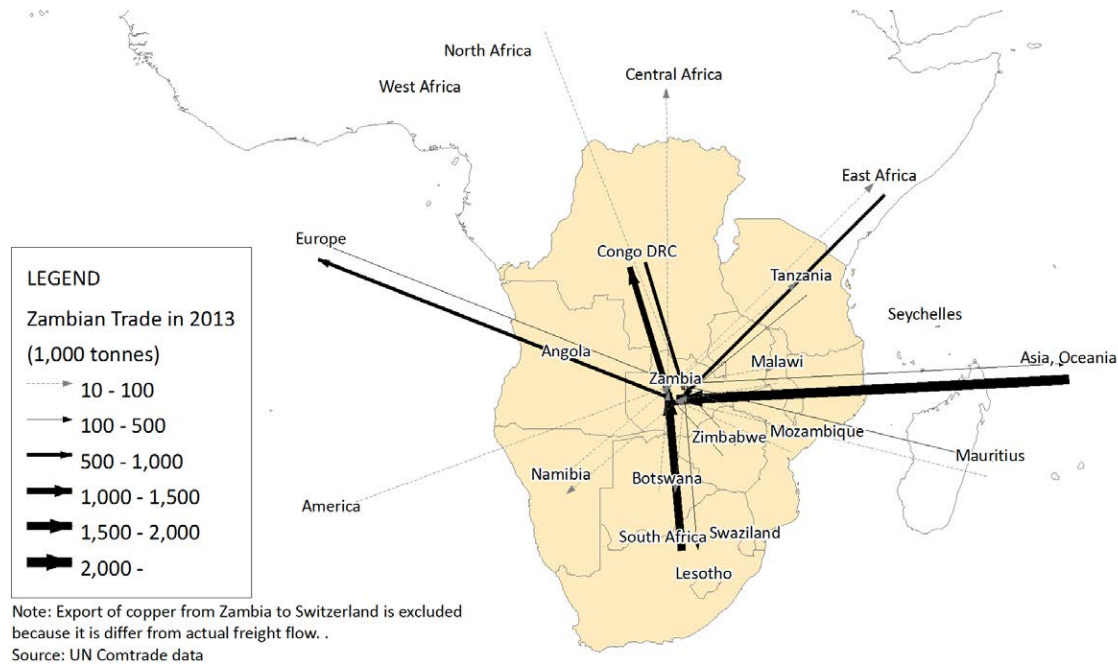
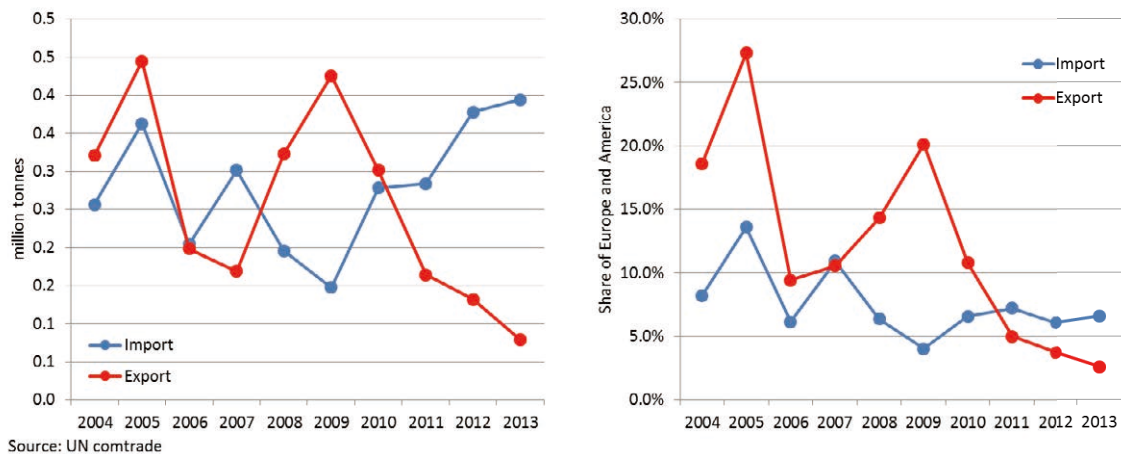


Figure 4.46: Zambian international trade in 2013



Note: Export of copper from Zambia to Switzerland is excluded because it differs from actual freight flow. .

Figure 4.47: Zambian trade volume with Europe and America

Table 4.37 shows the comparison of Zambian international trade with Europe/America and cross-border cargo at Walvis Bay Port in 2013. International trade between Zambia and Europe/America is estimated using both directions, namely, export/import data of Zambia with Europe/America in 2013 and export/import data of Europe/America with Zambia in 2012 based on UN ComTrade.

Transit cargo from Walvis Bay Port to Zambia is about 135 thousand tons (34% of Zambian import from Europe/America) and transit from Zambia to Walvis Bay Port is 44 thousand tons (19% of export from Zambia to Europe/America) in 2013.

**Table 4.37: Transit Cargo between Walvis Bay and Zambia and
Zambian Trade with Europe/America**

Unit: tons

Commodity	Transit Cargo between Walvis Bay and Zambia in 2013 (tons)		Estimated Zambian international trade with Europe and America in 2013 (tons)	
	Transit from Zambia to Walvis Bay Port	Transit from Walvis Bay to Zambia	From Zambia to Europe and America	From Europe and America to Zambia
Live Animals, Meat & Edible Meat Offal	0	3,552	3	4,447
Fish and Crustaceans	32	12,616	9	179
Vegetable and Fruits	0	64	1,617	311
Prepared Foodstuffs	628	1,227	387	7,182
Beverage	80	268	51	456
Cereals & Milling Industry Products	40	0	339	7,726
Animal Feed	0	0	300	323
Sugars & Sugar Confectionery	0	0	117,769	2,256
Other Agricultural Products	0	128	12,521	620
Fertilizer	0	0	24	34,072
Petroleum, Oil and Gas	0	21	0	3,183
Copper ores and concentrates	4,336	0	1,443	0
Zinc ores and concentrates	0	0	150	0
Manganese ores and concentrates	0	0	3,994	0
Coal	0	0	0	100
Salt	0	59	0	7
Marble, Fluorspar	0	20	0	0
Diamonds and other precious stones, ore	0	0	1,568	10
Other Ore, Slag, Stone and Sand	192	0	228	110,481
Metal and Metal Products	0	570	28,783	17,840
(Copper)	37,328	840	27,507	20
Chemicals and Industrial Material	20	9,588	3,463	27,471
Garment, Textiles and fabric	160	180	17,308	11,672
Wood and Wood Products	32	252	103	116
Paper and Printed Matter	0	13,816	41	11,979
Cement, Construction Material	0	1,340	0	6,380
Household articles, Pharmaceutical products	760	2,344	12,067	27,381
(General cargo)	372	6,948	N/A	N/A
Passenger Car, Truck, Motorcycle	25	65,388	182	86,652
Rail locomotive, coaches, Aircraft and Vessel	0	0	22	779
Machinery and Parts	232	11,598	484	37,037
Other unclassified goods	0	3,908	29	156
Total	44,237	134,726	230,392	398,835

Note: Export of copper from Zambia to Switzerland is excluded because it differs from actual freight flow.

Source: Zambian international trade is based on UN ComTrade, transit cargo relevant to Walvis Bay Port is provided by Namport.

Some commodities in UN ComTrade such as sugar from Zambia to Europe/America is smaller than actual flow; therefore, in further analysis on potential transit cargo through Namibia more reliable data should be used.

4.3.2 Six different groups of cargo flows through the corridors in Namibia

Analyses of international trade and transit trade of Namibia, traded goods going through Namibia can be classified into the following 6 groups. Groups from 1 to 4 are traditional flows of goods, and their volume occupies a major portion of cargo flows in Namibia both in terms of value and volume.

“Group 5: flows between Walvis Bay and SADC inland countries” is rather new and still small but rapidly increasing. The logistics industry in Namibia could find new opportunities for rapid growth

by expanding the transport volume of this group. Transporting goods of this group has better prospects to promote new types of logistics industries, such as “supply depot warehouses of consumer goods” in the middle to long-term.

Flows of group 6 have not been observed yet. However, there is potential that the southern regions of Namibia could achieve self-sustaining economic growth by enhancing economic links with the Northern Cape, together with efficient use of Lüderitz Port.

Group 1: flows for domestic demand

Route	- WB to Trans-Kalahari to Windhoek - RSA to Trans-Kalahari and Trans-Orange to Windhoek
Mode	Mostly road. Some portion by Rail.
Demand	Limited to population of 2 million.
Supply	Existing logistics bases in Walvis Bay/Swakopmund and Windhoek serve and meet the demand.
Prospects	- Future demand depends upon population increase and level of consumption within Namibia. - More cargo could be shifted on the rail if it becomes a competitive option. This will remove immediate pressure on the road infrastructure.

Group 2: flows for exports originating from Namibia

Route	- Trans-Kalahari and Trans-Orange to RSA (beer & beef) - WB – Trans-Kalahari to RSA (not so much) - WB – to EU (fish) - WHK airport to Belgium, UK, Botswana (diamonds)
Mode	All modes (it depends upon goods and market)
Demand	Relatively well established market
Supply	Existing logistics bases in Namibia serve and meet the demand.
Prospects	- Future demand depends upon supply capacity of Namibia. - Vital importance for existing main industries, but its growth margin will be limited in terms of quantity.

Group 3: flows from South Africa to Angola (one-way “pipeline” transit)

Route	- RSA – Trans-Kalahari – Trans-Cunene to Oshikango (and to Angola). (Consumer goods) - RSA – Trans-Orange – Trans-Cunene to Oshikango (and to Angola). (Perishable goods)
Mode	Road
Demand	- Serves southern part of Angola. - Stable demand for cargo originating in South Africa.
Supply	South African Trucks in transit. (Need to confirm)
Prospects	- No substantial changes in demand structure within 5-10 years. Per Capita income of Angola is already over US\$5000, thus demand structure is as mature as the one in Namibia. - There is no other alternative route to compete. (Need to confirm)

Group 4: flows from Walvis Bay to Angola (one-way transit)

Route	WB to Trans-Cunene to Oshikango.
Mode	Road
Demand	- Serves southern part of Angola. - Demand for cargo originating from places other than South Africa. - The largest among the flows through WB and the corridors so far.
Supply	Namibian Trucks.
Prospects	- No substantial changes in demand structure within 5-10 years. Per Capita income of Angola is already over US\$5000, thus demand structure is as mature as the one in Namibia.

	<ul style="list-style-type: none"> - In the longer term (10 years and beyond), part of flows from Walvis Bay – Angola will shift to direct route to Angolan ports. - Large portion of cargo could be shifted on the rail if sections between Walvis Bay to Otavi are rehabilitated and it becomes a competitive option. This will remove immediate pressure on the road infrastructure.
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Group 5: flows between Walvis Bay and SADC inland countries (Zambia, DRC, Zimbabwe)

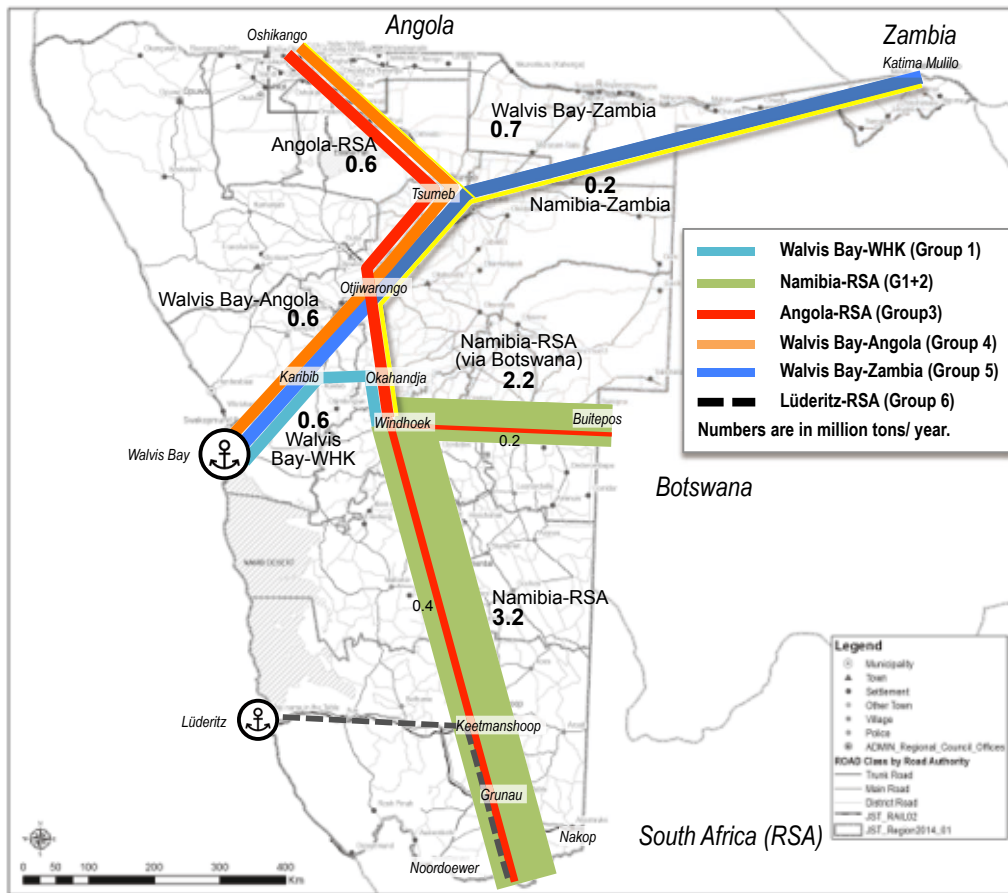
Route	WB to WLND to Katima Mulilo and to Lusaka (Zambia) and Lubumbashi (DRC).
Mode	Road
Demand	<ul style="list-style-type: none"> - DRC: everything is imported. - Zambia-Copperbelt: inbound (inputs for copper mines), outbound (copper and copper processed products). - Zambia-Lusaka: inbound (consumer goods, inputs for manufacturing, second-hand cars), outbound (sugar, soybean, timber). - Use of Namibian route is increasing but still very small to be recognized as a substantial player. - Frozen fish, chicken from Walvis Bay to Zambia and DRC. - Second Hand Cars to Zambia and Zimbabwe (on own wheels).
Supply	<ul style="list-style-type: none"> - Namibian route is, in general, not competitive at the moment. Many logistics players believe that direct freight cost through Namibia is much higher than the other routes (Ports of Dar es Salaam and Beira). The route to South -Africa has been dominant as its gateway function to export copper and its supply depot functions for the whole region. - Current volume is too small. It is suspected that most of (not all) of the Namibian logistics industry, which is small, is satisfied with serving demand from current domestic market and not really interested in this market (need to confirm). - Namibian Trucks are seen as expensive. - Zambian Trucks often find no return cargo to pick up in Walvis Bay. - Second hand vehicles are increasing but mode of transport is “on its own wheels”.
Prospects	<ul style="list-style-type: none"> - Immediate term, Namibia route should get more volume as soon as possible. - Immediate targets are copper industry related flows of cargo. - Short to mid term, put focus on cargo flows between EU/US and Zambia/DRC. - Supply of trucks for international transit movements should be increased dramatically by establishing closer alliance with logistics industry in neighbouring countries. - There will be substantial changes in demand structure within 5-10 years. Per Capita income of Zambia is still less than US\$5,000, thus demand structure will change as the income level rises. - Road transport will be the main mode in the short to mid term (say until throughput is tripled). When the volume reaches the point where Namibia is recognized to be a substantial player, modal shift to rail will be realistic.

Group 6: flows between Northern Cape to Lüderitz

Route	Northern Cape (RSA) – Trans-Orange - Lüderitz
Mode	Mostly road. Expected to shift some to rail after completion of extension of railway into the port.
Demand	Limited to fish and zinc export originating in Namibia.
Supply	Existing logistics bases in Lüderitz serve and meet the present demand. Only 1/3 of the port capacity is used.
Prospects	<ul style="list-style-type: none"> - Future demand depends upon how far Lüderitz can capture potential demand in Northern Cape, RSA. - Most cargo could be shifted by rail if it becomes a competitive option, especially for mining products both in Namibia (zinc) and Northern Cape (manganese). - It is very important to be tactically flexible and progressive to involve any possible FDIs to develop the Port of Lüderitz and rail network.

4.3.2.1 Volume of six groups of cargo flows along the corridors

Volumes of above-mentioned 6 groups of cargo flows along the corridors in Namibia are illustrated in the following figure and table. It is clearly seen that flows between Namibia and South Africa dominate and presumed to account for around 70% of the current logistics market in terms of volume.



Source: Estimates in Namibia Integrated Transport Master Plan (2013)

Figure 4.48: Trade volume along the Corridors in Namibia

4.4 Distance and transit time between gateway port and inland countries

Figure 4.49 shows location of major towns in inland countries and 3 ports (Walvis Bay, Durban and Dar es Salaam). Distances between gateway port and inland countries are indicated in Figure 4.50, and Transit time between gateway port and inland countries are indicated in Figure 4.51, respectively.

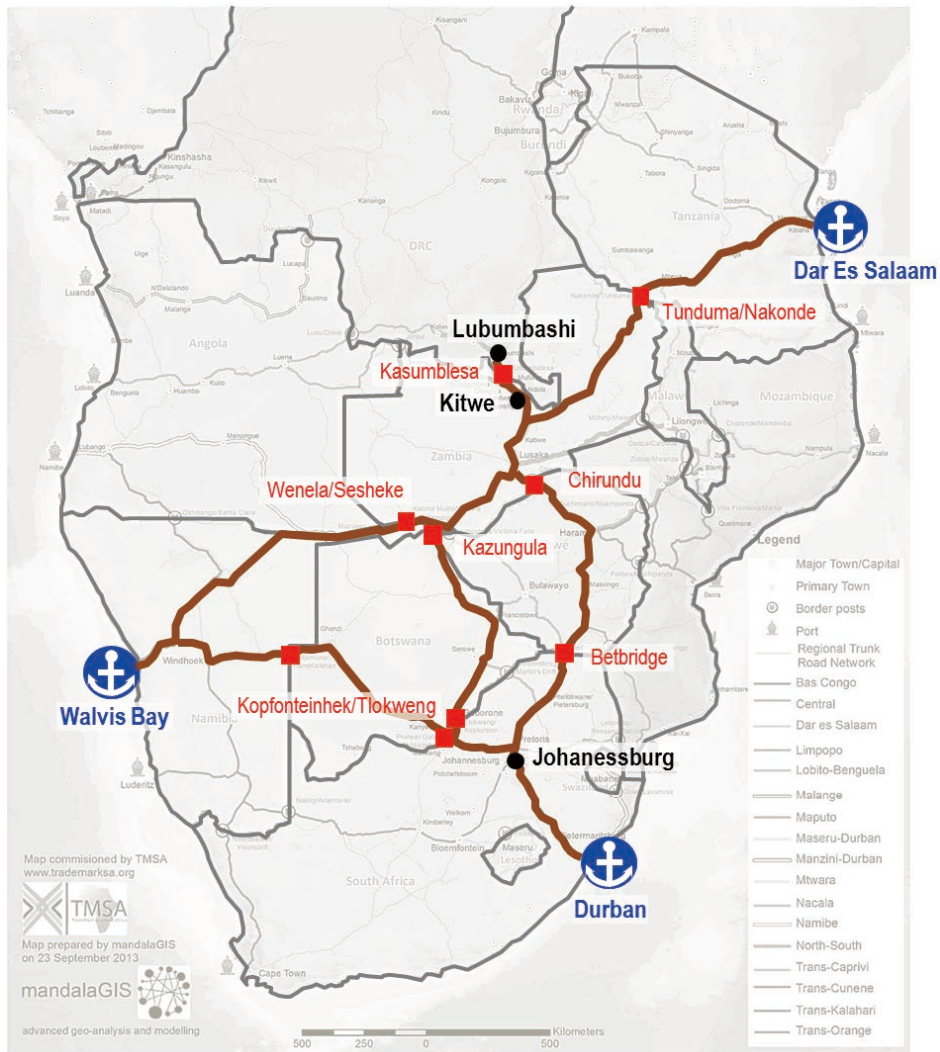


Figure 4.49: Trucking route with inland countries from gateway port at southern Africa

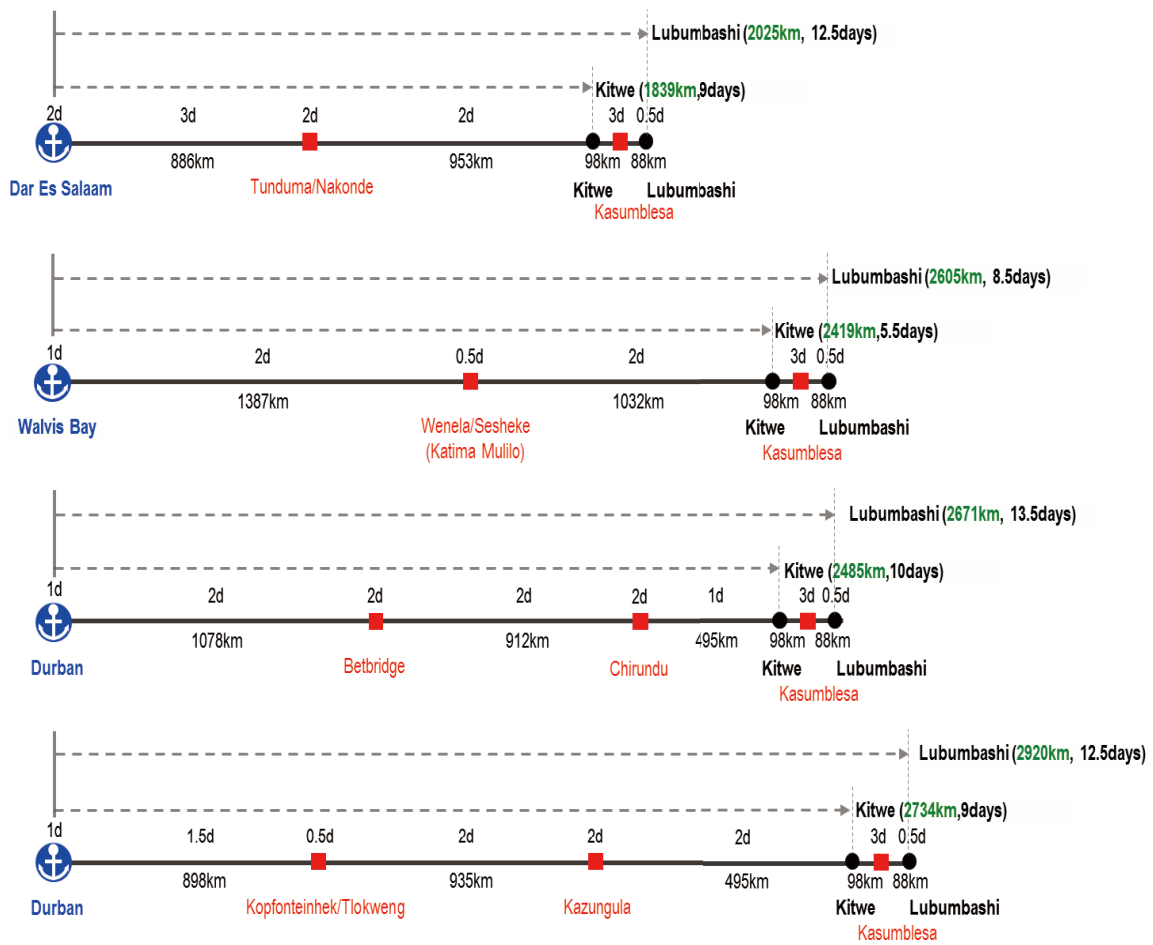


Figure Distance Comparison between Gateway Port and Inland Countries

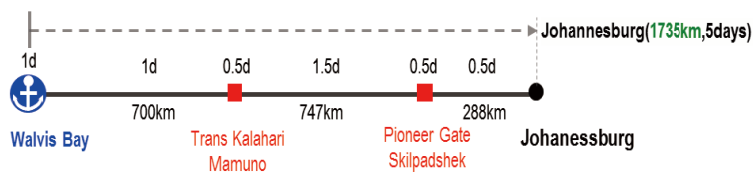


Figure 4.50: Distance of 3 ports and major cities in inland countries

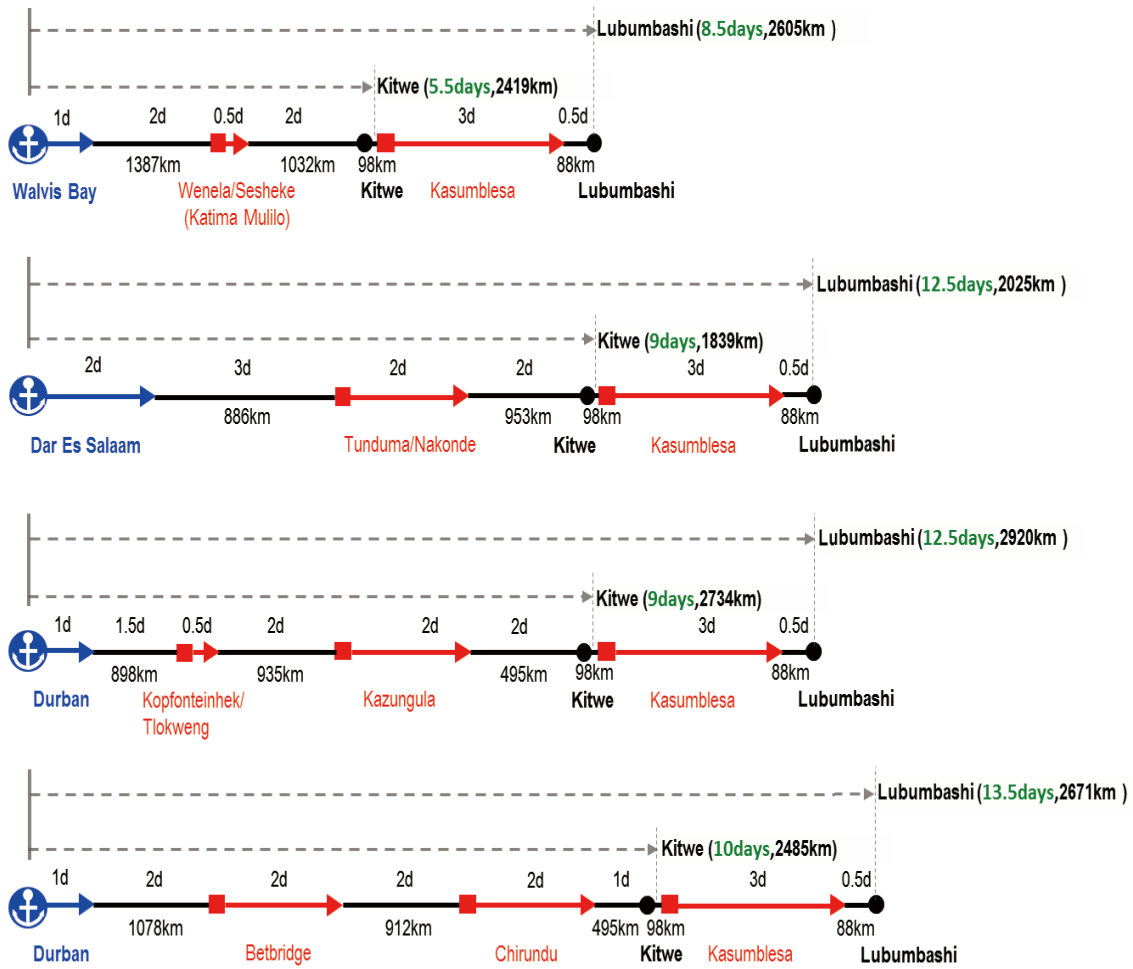


Figure Transit Time Comparison between Gateway Port and Inland Countries

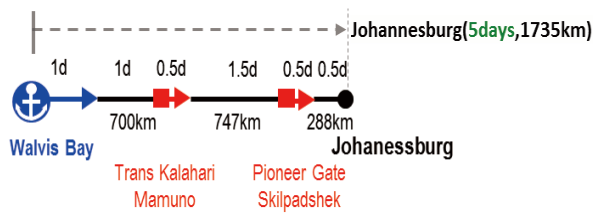


Figure 4.51: Transit Time between 3 ports and major cities in inland countries

Table 4.38: Distance between Walvis Bay and Ndola and Lubumbashi

	Walvis Bay Kolwezi via Katima Mulilo	Distance	Time days	Road condition	Documents required at the border
Namibia	Walvis Bay port		1		
	Walvis Bay to Karibib	210		C - Good	
	Karibib to Otiwarongo	193		C - Good	
	Otiwarongo to Otavi	119		C - Good	
	Otavi to Wenela	865		C - Good	
		1,387	2		
Border post	Wenela Sesheke		0.5		Manifest Commercial Invoice F178 goods over R50,000 SAD 500 (Bill of entry) SADC 500 (Certificate) Packing list
Zambia	Sesheke to Livingstone	195		C - Good	
	Livingstone to Lusaka	476		C - Good	
	Lusaka to Kapiiri Mposhi	206		C - Good	
	Kapiiri Mposhi to Kitwe	153		C - Good / Fair	
	Kitwe to Chililabombwe	76		C - poor	
	Chililabombwe to Kasumbalesa	22		C - Poor / Fair	
		1130	2		
Border post	Kasumbalesa		3		Manifest, original bill, bill/L, BIVAC certificate, maritime and road insurances cross border transport permit delivered by origin truck country. International road permit
DRC	Kasumbalesa to Lubumbashi	88		C - Good	
	Lubumbashi to Likasi	124		C - Good	
	Likasi to Kolwezi	185		E - Good	
		397	2		
	Totals	2914	10.5		

Source: Africa Road Corridors handbook

Table 4.39: Cost between Walvis Bay and Ndola and Lubumbashi

	Description of charge	Costs				Remarks
		Local currency		Local transporters	Foreign transporters	
		N\$	US\$	N\$	N\$	
Namibia	Harbour permit per 6mths 2009	361	35	361	361	
	Diesel cost	7	975	10,009	10,009	
	Visa	390	38	0	390	Burundi, DRC, Rwanda, Uganda
	Carrier licence per annum for all Trucks	1,200	117	0	1,200	Department for Permits +264 284 7000
	Mass distance per 100km 34,000kg	0	24	0	250	US\$9 per 100km rounded
						Drive left side of the road
		Total		1,189	10,369	12,209
Border post	Customs Immigration					
Zambia		Kwacha	US\$	US\$	US\$	None for SADC Countries
	Diesel cost	7,377	1,765	1,765	1,765	Foreigners are allowed 90 days per year
	Visa	0	0	0	0	
	Carrier licence per annum for all Trucks	1,200	117	0	117	
	Yellow card over 7months truck/ tractor	350,000	67	67	67	
	Yellow card over 7mtonhs trailer	0	0	0	0	A mobile ZRA unit operates on the 65km stretch

	Description of charge	Costs			Remarks	
		Local currency		Local transporters		Foreign transporters
	Katima Mulilo Brdg /Sesheke	0	431	431	431	
	Municipality fee (Council Levy)	0	20	0	20	Between Kafue and Lusaka, and conducts random
	Crossing Fee - Kasumbalesa	0	250	250	250	
	Carbon tax for 1 Month	200,000	38	38	38	Inspection on trucks travelling on this route
	Parking fee - Kasumbalesa	0	5	5	5	
	RUC		226	0	226	US\$10 per 100km rounded
	Total		2,919	2,556	2,919	Drive left side of the road
Border post	Customs/border charges Immigration		200	200	200	
DRC		Franc	US\$	US\$	US\$	
	Diesel cost	1,300	615	615	615	
	Entry per person (2 weeks)	0	55	0	55	
	Kasumbalesa to Kolwezi (Return)	0	900	900	900	
	Border Crossing Fee - Kasumbalesa	0	200	200	200	
	Parking fees first 24 hours Free	0	10	10	10	
	Government tax	0	65	0	65	
	Carbon tax each entry	0	35	35	35	
	Visa vehicle card entry	0	15	0	15	
	Ins Trucks with 2 axles & more per month	0	465	465	465	
	No Yellow Card	0	0	0	0	
	Tourism Yellow fever vaccination	0	35	0	35	
	Fumigation each entry	0	50	50	50	
	Photo Copies	0	10	10	10	
	Break bulk Cargo	0	20	0	20	
	Disinfection (Ministry of Health)	0	50	50	50	
	RUC		79	79	79	US\$10 per 100km rounded
	Total		2,804	2,614	2,804	Drive right side of the road
			6,912			

Source: Africa Road Corridors handbook

Table 4.40: Distance between Durban and Kolwezi via Beitbridge–Harare

		Distance	Time days	Road condition	Documents required at the border
South Africa	Durban Port		1		
	Durban to Johannesburg	557.0		A - Good	
	Johannesburg to Beitbridge	521.0		A - Good / C - Good	
		1,078.0	2		
Border post	Beitbridge		2		Manifest Commercial Invoice GVM under 3500Kg No Permit F178 goods over R50,000 SAD 500 (Bill of entry) SADC 500 (Certificate) Packing list
Zimbabwe	Beitbridge to Harare	580.0		C - Fair / potholes	GVM under 3500Kg No Permit
	Harare to Chirundu	332.0		C - Fair / stripping needs resealing	
		912.0	2		
Border post	Chirundu		2		
Zambia	Chirundu to Lusaka	136		C - Good	
	Lusaka to Kapiri Mposhi	206		C - Good	
	Kapiri Mposhi to Kitwe	153		C - Good / Fair	
	Kitwe to Chililabombwe	76		C - poor	
	Chililabombwe to Kasumbalesa	22		C - Poor / Fair	
		593	1.5		
Border post	Kasumbalesa		3		Manifest, original bill, bill/L, BIVAC certificate, maritime,

		Distance	Time days	Road condition	Documents required at the border
					and road insurances cross border transport permit Delivered by origin truck country, International road permit
DRC	Kasumbalesa to Lubumbashi	88		C - Good	
	Lubumbashi to Likasi	124		C - Good	
	Likasi to Kolwezi	185		E - Good	
		397	2		
	Total	2980	15.5		

Source: Africa Road Corridors handbook

Table 4.41: Cost between Durban and Kolwezi via Beitbridge - Harare

	Description of charge	Costs				Remarks
		Local currency		Local transporters	Foreign transporters	
		Rand	US\$	Rand	Rand	
South Africa	Harbour permit per year 2009	225	22	225	225	
	Diesel cost	12.4	1,425	14,704	14,704	
	Visa	0	0	0	0	
	Transport permit	2,660	258	2,660	2,660	
	Permit application Fee	760	74	760	760	
	Fuel levy applicable 40 cents per litre	0	0	0	0	
	Durban - Marianhill (Intertoll)	60	6	60	60	
	Toll - Marianhill - Joburg (Tolcon)	1,292	125	1,292	1,292	
	Toll - Joburg-Warmbaths (Bakwena)	338	8	338	338	
	Toll - Warmbaths-Beitbridge (Intertoll)	1,086	105	1,086	1,086	
	Total		1,909	19,701	19,701	Drive left side of the road
Border post	Customs Immigration					
Zimbabwe		Zimbabwe dollar	US\$	US\$	US\$	VISA
	Diesel cost	0	1,104	1,104	1,104	None for SADC Countries
	Visa	0	0	0	0	Application and Permit for Bi-Literal & COMESA
	Carriers licence (COMESA & B/L)	0	150	150	0	Application US\$150 and Permit US\$500
	Carriers licence 28 days Bots & Tanzania	0	500	0	500	
	Yellow card over 7months truck/ tractor	0	120	120	120	No movement of Dangerous Goods 18hrs - 06hrs
	Yellow card over 7months trailer	0	0	0	0	
	New Limp Bridge per crossing	0	27	27	27	
	Carbon tax Horse pm	0	30	30	30	
	Carbon tax Trailer pm	0	10	10	10	
	Goods inspection fee	0	25	25	25	
	Parking fee per night	0	5	5	5	
	RUC Beitbridge - Chirundu		182	0	182	US\$10 per 100km rounded
	Total		2,153	1,471	2,003	Drive left side of the road
Border post	Customs Immigration					
Zambia		Kwacha	US\$	US\$	US\$	
	Diesel cost	7377	926	926	926	None for SADC Countries
	Visa	0	0	0	0	Foreigners are allowed 90 days per year
	Carriers license per year	586000	113	113	113	
	Yellow card over 7months truck/ tractor	350000	67	67	67	
Yellow card over 7months trailer	0	0	0	0	A mobile ZRA unit	

	Description of charge	Costs			Remarks	
		Local currency		Local transporters		Foreign transporters
					operates on the 65km stretch	
	Municipality fee (council levy)	0	20	0	20	Between Kafue and Lusaka, and conducts random
	Crossing Fee - Kasumbalesa	0	250	250	250	
	Carbon tax US\$ per Month	200,000	38	38	38	Inspection on trucks travelling on this route
	Parking fee - Kasumbalesa	0	5	5	5	
	RUC Chirundu - Kasumbalesa		119	0	119	US\$ 10 per 100km rounded
	Total		1538	1399	1538	Drive left side of the road
Border post	Customs/border charges Immigration		200	200	200	
		Franc	US\$	US\$	US\$	
	Diesel cost	1300	615	615	615	
	Entry per person (2 weeks)	0	55	0	55	
	Kasumbalesa to Kolwezi (Return)	0	900	900	900	
	Border Crossing Fee - Kasumbalesa	0	200	200	200	
	Parking fees first 24 hours free	0	10	10	10	
	Government tax	0	65	0	65	
	Carbon tax each entry	0	35	35	35	
	Visa vehicle card entry	0	15	0	15	
	Ins trucks with 2 axles & more per month	0	465	465	465	
	No Yellow Card	0	0	0	0	
	Tourism yellow fever vaccination	0	35	0	35	
	Fumigation each entry	0	50	50	50	
	Photocopies	0	10	10	10	
	Break bulk Cargo	0	20	0	20	
	Disinfection (Ministry of Health)	0	50	50	50	
	RUC		79	79	79	US\$10 per 100km rounded
			2804	2614	2804	Drive right side of the road
			8405			

Source: Africa Road Corridors handbook

Table 4.42: Distance between Dar es Salaam and Lusaka

		Distance	Time days	Road condition	Documents required at the border
Tanzania	Dar es Salaam Port		2		
	Dar es Salaam to Morogoro	195		C - Good	
	Morogoro to Iringa	298		C - Good / Fair / Poor	
	Iringa to Uyole	285		C - Fair	
	Uyole to Tunduma	108		E - Good	
		886	3	T	
Border post	Tunduma Nakonde		2		Manifest Commercial Invoice F178 goods over R50,000 SAD 500 (Bill of entry) SADC 500 (Certificate) Packing list, C45 C65 Customs Licence
Zambia	Nakonde to Mpika	359		C - Poor / Potholed	
	Mpika to Serenje	236		C - Poor / Potholed	
	Serenje to Kapin Mposhi	205		C - Good	
	Kapiri Mposhi to Lusaka	206		C - Good	
		1,006	2	T	
	Totals	1,892	9	A	

Source: Africa Road Corridors handbook

Table 4.43: Cost between Dar es Salaam and Lusaka

	Description of Charge	Costs				Remarks
		Local currency		Local transporters	Foreign transporters	
Tanzania		Shilling	US\$	US\$	US\$	
	Harbour permit per year 2009					
	Diesel cost	1,400	844	844	844	
	P/port valid over 6 months/ yellow fever	80,850	50	0	50	Visa Burundi, DRC, Rwanda, South Africa
	Transport permit trailer expire in 31 December	485,100	300	300	300	No movement of dangerous goods 18 hrs – 06 hrs
	Yellow card over 7 months truck/tractor	0	0	0	0	
	Yellow card over 7 months trailer	0	0	0	0	
	RUC		284	0	284	US\$16 per 100km rounded
	Total			1477	1144	1477
Border post	Customs/border charges Immigration		125	125	125	
Zambia		Kwacha	US\$	US\$	US\$	
	Diesel cost	7377	1571	1571	1571	None for SADC Countries
	Visa	0	0	0	0	Foreigners are allowed 90 days per year
	Carriers license per year	586000	113	113	113	Tanzanian Vehicles
	Yellow card over 7 months truck/tractor	350000	67	67	67	
	Yellow card over 7 months trailer	0	0	0	0	
	Municipality fee (council levy)	0	20	0	20	
	Carbon Tax US\$ 1 Month	0	38	12	12	
	Parking Nakonde per day - Zamesco	0	24	24	24	Tanzania vehicles US\$16 per 100km rounded
	RUC		322	0	322	SADC US\$10 per 100km rounded
	Total			2280	1913	2254
			3758	3056	3732	

Source: Africa Road Corridors handbook

4.5 Review of the transport network model of the “National, Regional and International Integrated Transport Master Plan”

To contribute to consideration and evaluation of the proposed national transport program in the “Namibia Integrated Transport Master Plan (hereinafter referred to as “Transport Master Plan”)", the existing and future traffic demand regarding road and rail transport include both passenger and freight flows in Namibia are forecast using the conventional four step demand forecast model consisting of a trip generation model, trip distribution model, modal split model and assignment model.

4.5.1 Zoning system

In the Transport Master Plan, a traffic analysis zone system is defined to estimate traffic generation

and distribution by transport mode as of 2011, and to build a traffic demand forecast model. The traffic analysis zone in the Transport Master Plan consists of 24 zones in Namibia and 6 external zones such as Zambia and South Africa. Constituencies are used for traffic analysis zones in Namibia.

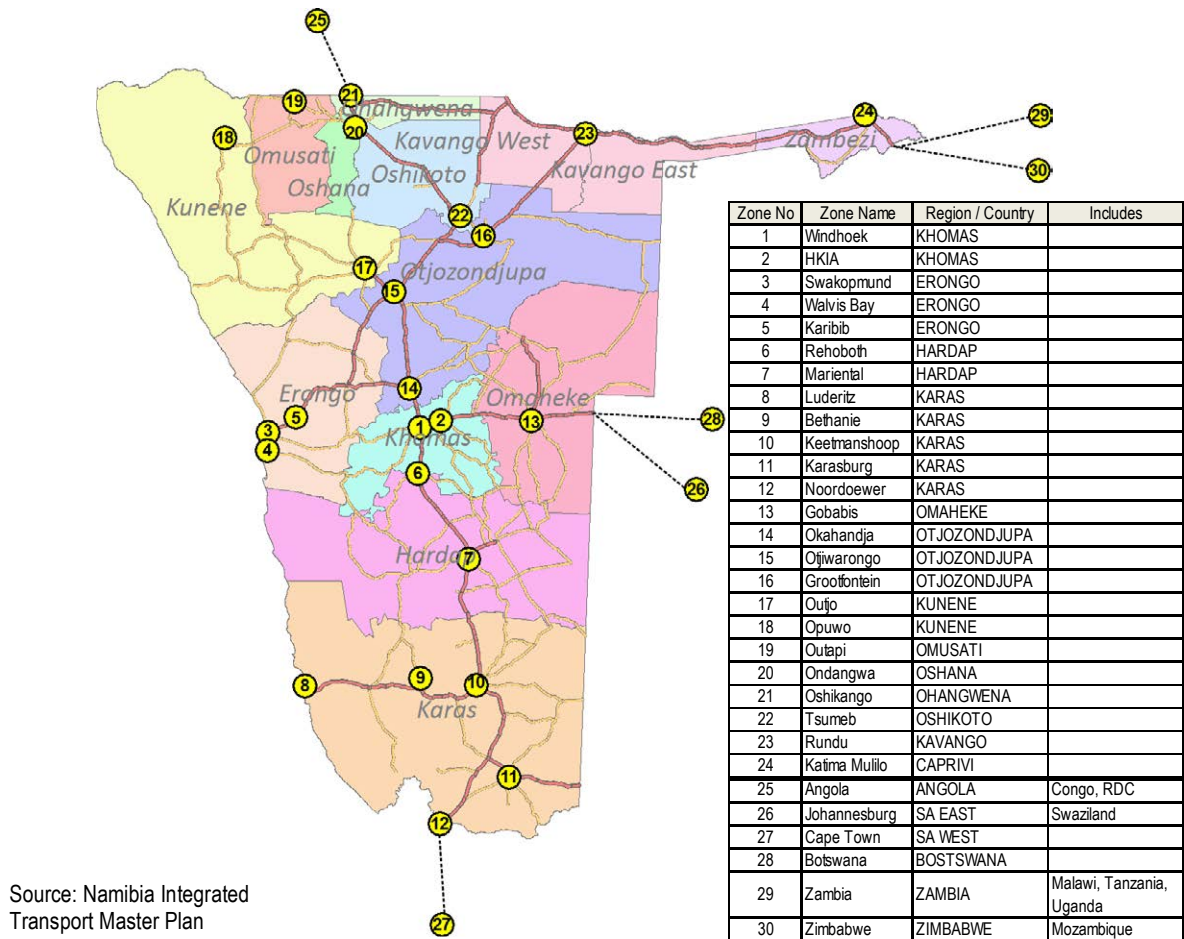
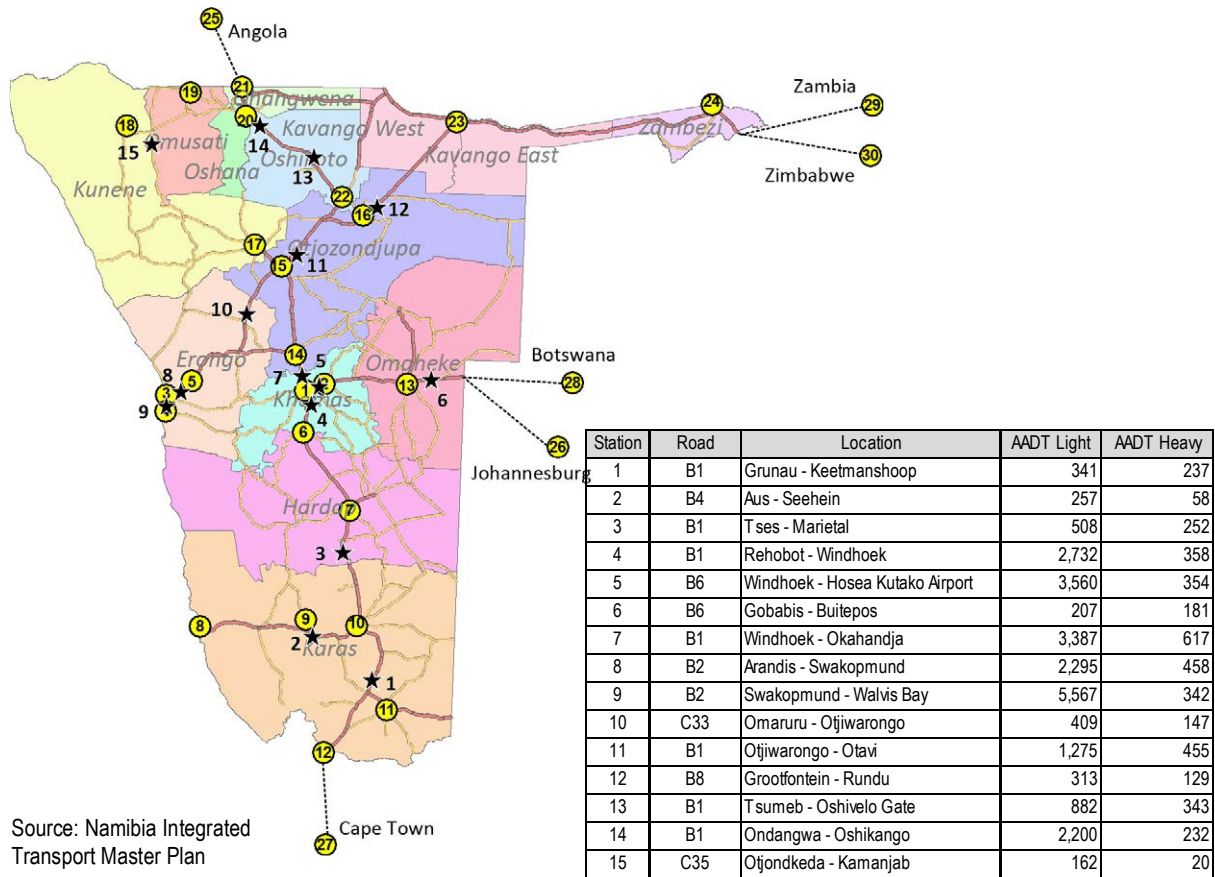


Figure 4.52: Traffic analysis zone in Integrated Transport Master Plan

4.5.2 Estimation of current traffic flow

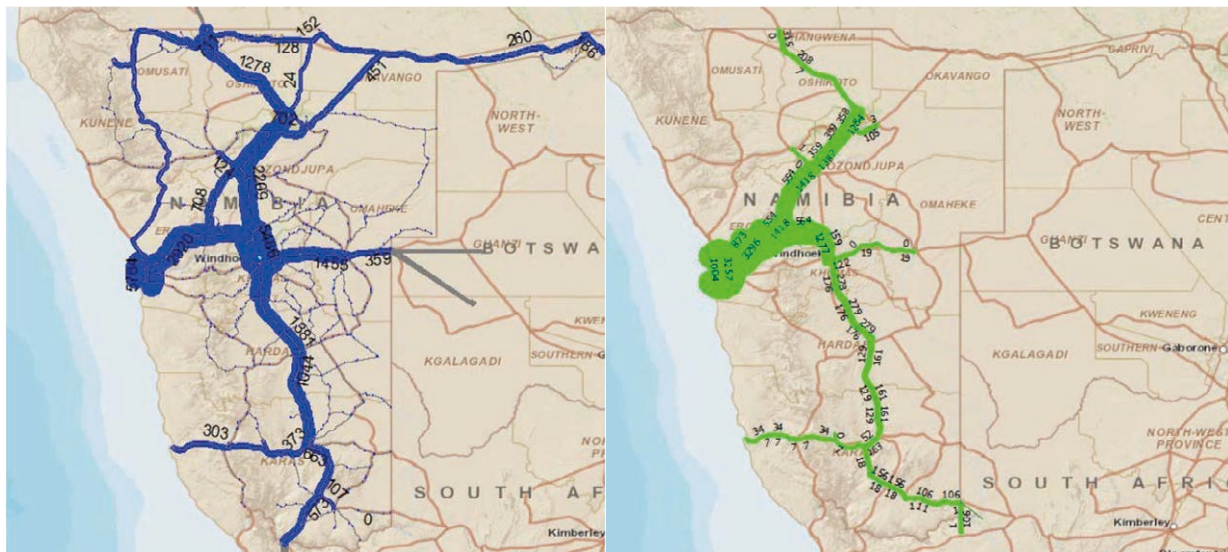
To estimate the current traffic flow including both passenger trips and freight flow, the Transport Master Plan study team carried out roadside driver interview surveys at 15 stations along transport corridors to collect vehicle trip information such as number of passenger, origin and destination address, purpose of trips, commodity transported and load weight etc. The roadside interview survey was carried out in June - August 2012, and the size of the sample collected was 7,791.



Source: Namibia Integrated Transport Master Plan

Figure 4.53: Locations of roadside driver interview survey Locations

The sample that was collected was expanded by Annual Average Daily Traffic (AADT) prepared by the Roads Authority by survey station and vehicle class (average sample ratio of light vehicles is 26.8% and heavy vehicles is 31.3%) to estimate the current traffic flow including passenger trips and freight flow via road transport. On the other hand, the current passenger trips and freight flow via railway is estimated from statistics of TransNamib.



Estimated Average Daily Traffic Volume in 2011
(vehicles in both directions)

Estimated Average Daily Freight Volume by
Railway in 2011 (tons by section)

Source: Namibia Integrated Transport Master Plan, 2013

Figure 4.54: Estimated current traffic volume in Integrated Transport Master Plan

4.5.3 Demand forecast model

Future person trips and freight flow is basically forecast by (i) trip generation model to calculate the number of passenger trips and freight volume leaving and arriving at each traffic analysis zone, (ii) trip distribution model to calculate the number of passenger trips and freight volume from one traffic analysis zone to another zone called OD volume, (iii) modal split model to decide the share of passenger trips and freight volume of different transport modes from one zone to another, and (iv) traffic assignment model for calculating the number of passenger trips and freight volume by alternative route from origin zone to destination zone in the transport network in accordance with travel time and cost between two zones.

In the Transport Master Plan, future person trip generation at each traffic analysis zone is calculated by the annual population growth rate by region defined by United Nations' Population Forecast. Details of the person trip distribution model are not indicated in the Transport Master Plan report. However, the present pattern seems to be adapted to future person trip OD. The modal split model for person trip seems to be ignored because of the low number of railway passengers (average daily railway passengers in 2011 was about 200 passengers/day). Forecast future person trip OD is converted to passenger vehicle OD by vehicle composition and vehicle occupancy which means a ratio of vehicle type and number of passengers per vehicle. Forecast future vehicular OD for passenger vehicles is assigned on the shortest route between origin zone and destination zone in the road network decided by travel time and travel cost by road link in accordance with actual distance, structure and condition of each road link.

Freight flow is divided into (i) domestic which is export/import to/from SADC countries, (ii) regional trade in SADC, and (iii) transit cargo through Namibia according to the Transport Master Plan.

In the Transport Master Plan, export and import to/from SADC is calculated by elasticity of trade volume to GDP growth rate. The Transport Master Plan study team calculated that the annual GDP growth rate of Namibia is 5.5% and elasticity of trade volume to GDP is 1.5, as a result, annual growth rate of trade volume relevant to Namibia and SADC is 8.25% p.a.

According to the Transport Master Plan, the future trade volume within SADC is based on the estimation of “Definition and Investment Strategy for a Core Strategic Transport Network for Eastern and Southern Africa (PPIAF, 2011)”. The future trade in SADC is, according to the PPIAF report, forecast by following flow chart.

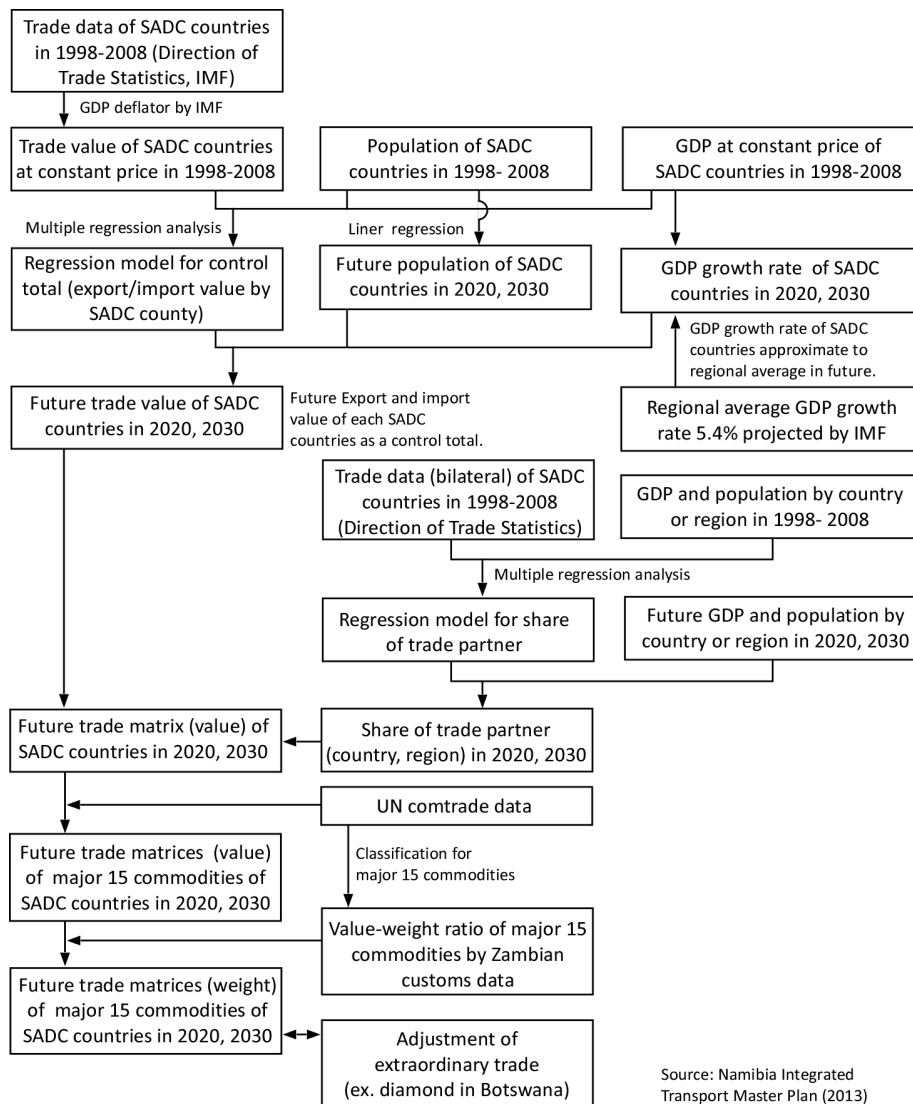


Figure 4.55: Trade flows forecast in SADC in Integrated Transport Master Plan

In the PPIAF report, a regional transport model is built for choice of transport corridor and transport mode such as road or railway in order to estimate freight volume and evaluate corridor development. The transport model is developed based on forecast future trade matrices in SADC. The Regional transport model is estimated by the following factors.

- Trade volume after a decade,
- Network component characteristics and strategic priority rating including service area,
- Traffic volume in 2030,
- Potential traffic,
- Development potential,
- Infrastructure capacity,
- Redundancy support,
- Network condition, and
- Strategic priority rating and total score.

The Transport Master Plan study team reviewed the future corridor freight volume forecast by the PPIAF report and compared it with available data on Namibia such as foreign trade statistics, heavy traffic volumes near borders and transit freight volume prepared by WBCG. According to that, PPIAF's future freight volume by corridor has some anomalies such as,

- Trans-Orange is not covered in the PPIAF study.
- Future freight demand of WNLDC is overestimated, and
- SADC regional freight demand for Trans-Cunene is underestimated.

For these reasons, the Transport Master Plan study team modified PPIAF's future freight demand by corridor as follows,

- Freight volume of Trans-Orange is estimated by the difference between total export/import volume of Namibia and the aggregate of export/import volume of three corridors and seaborne freight.
- The balance of Trans-Cunene and WNLDC is modified under total of future freight demand forecast of those two corridors by PPAIF report.

4.5.4 Future freight demand

Table 4.44 shows the results of future freight demand forecast in the Transport Master Plan.

Table 4.44: Forecast future freight volume in Namibia in the Transport Master plan

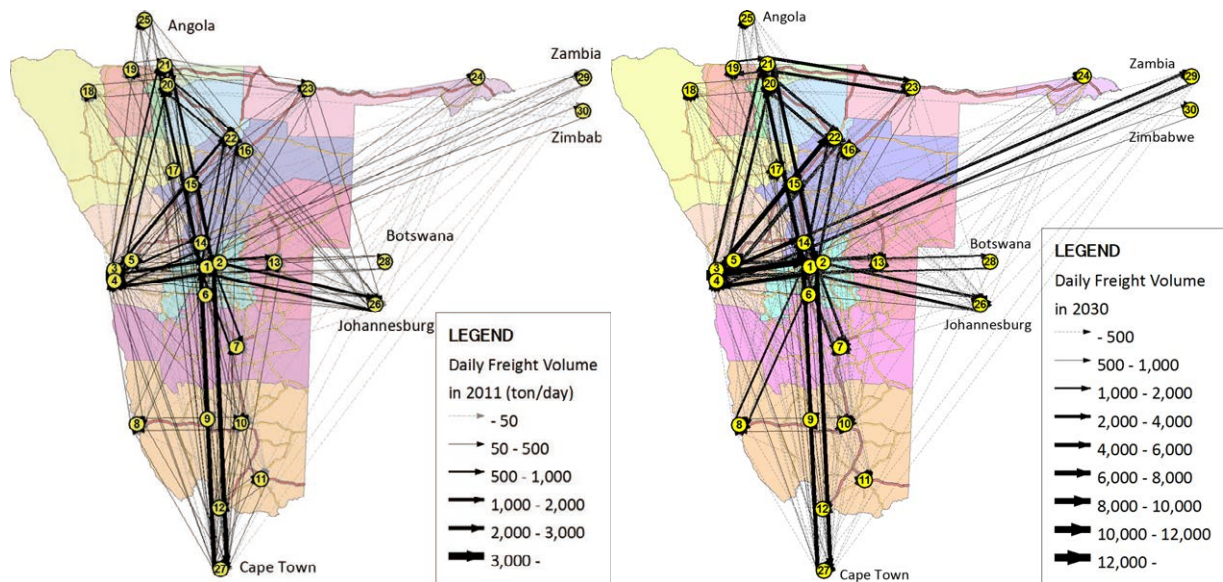
	2011		2015		2030	
Domestic (export, import to/from out of SADC)	44,656	(70%)	61,318	(72%)	201,375	(79%)
SADC regional	15,431	(24%)	18,875	(22%)	39,993	(16%)
Transit	3,535	(6%)	5,220	(6%)	12,500	(5%)
Total	63,622	(100%)	85,413	(100%)	253,868	(100%)

Source: Namibia Integrated Transport Master Plan (2013)

Table 4.45: Average annual growth rate of future freight volume

	2011-2015	2015-2030
Domestic (export, import to/from out of SADC)	8.25%	8.25%
SADC regional	5.17%	5.13%
Transit	10.24%	5.99%
Total	7.64%	7.53%

Source: Namibia Integrated Transport Master Plan (2013)



Source: Namibia Integrated Transport Master Plan (2013)

Figure 4.56: Desire line of freight demand forecast in the Transport Master Plan

In the Transport Master Plan, freight demand forecast is assigned to the transport network in order to calculate freight demand by transport corridors in Namibia. Forecast freight demand in the Transport Master Plan is summarized in Table 4.46.

Table 4.46: Forecast trade volume along the Corridors in Namibia

Unit: million tons/year

	2011	Average annual growth rate 2011-2015	2015	Average annual growth rate 2015-2030	2030
Trans-Orange (Noordoewer / Nakop – Grünau)	3.595	5.5%	4.451	14.9%	7.768
Transit traffic from landlocked countries	0	N/A	0	N/A	0
Regional trade (road + rail)	3.595	5.5%	4.451	14.9%	7.768
Namibia-South Africa	3.232	4.9%	3.921	15.3%	6.928
Angola-South Africa	0.363	9.9%	0.530	12.2%	0.841
Trans-Kalahari (Buitepos - Windhoek)	2.456	5.5%	3.039	14.9%	5.295
Transit traffic from landlocked countries	0.013	11.4%	0.020	36.8%	0.070
Regional trade	2.443	5.4%	3.019	14.7%	5.225
Namibia / Botswana	0.046	2.6%	0.051	-2.5%	0.046
Namibia-South Africa	2.155	4.9%	2.614	15.3%	4.618
Angola-South Africa	0.242	9.9%	0.353	12.3%	0.561
WNLDC (Tsumeb - Katima Mulilo)	0.899	13.8%	1.510	28.0%	4.050
Transit traffic from landlocked countries	0.724	14.9%	1.260	30.0%	3.600
Regional trade (Namibia / Zambia - DRC - Zimbabwe)	0.175	9.3%	0.250	15.8%	0.450
Trans-Cunene (Tsumeb - Oshikango)	1.254	8.7%	1.752	9.5%	2.520
Transit traffic to Angola	0.574	8.7%	0.800	6.5%	1.030
Regional trade	0.680	8.8%	0.952	11.9%	1.490
Namibia / Angola	0.075	-2.1%	0.069	6.6%	0.089
Angola-South Africa	0.605	9.9%	0.883	12.2%	1.401

Source: Namibia Integrated Transport Master Plan (2013)

Table 4.47: Trade volume along the corridors in Namibia

	Cargo Volume (million tons/year, 2011)
Trans-Orange (Noordoewer/Nakop - Grünau)	3.6
Transit traffic from landlocked countries	0.0
Regional trade (road + rail)	3.6
Namibia-South Africa (G1+2)	3.2
Angola-South Africa (G3)	0.4
Trans-Kalahari (East: Buitepos - Windhoek)	2.5
Transit traffic from landlocked countries	0.0
Regional trade	2.4
Namibia / Botswana (G5)	0.0
Namibia-South Africa (G1+2)	2.2
Angola-South Africa (G3)	0.2
Trans-Kalahari (West: Walvis Bay - Windhoek) (G1)	0.6
Trans-Caprivi (Tsumeb - Katima Mulilo)	0.9
Transit traffic from landlocked countries (G5)	0.7
Regional trade (Namibia/Zambia - DRC - Zimbabwe)	0.2
Trans-Cunene (Tsumeb - Oshikango)	1.3
Transit traffic to Angola (G4)	0.6
Regional trade	0.7
Namibia/Angola	0.1
Angola-South Africa (G3)	0.6
Total	8.8

Source: Estimates in Namibia Integrated Transport Master Plan (2013)