

Salt Partners

Salt Business in Africa

Trends and Opportunities

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The Bata Shoe Company

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In 1894, the shoemaker Thomas Bata established the Bata Shoe Company in Zlin, Czechoslovakia.

In 2017, Bata has:

- Headquarters in Lausanne, Switzerland
- 30'000 employees
- 5'300 retail shops in 70 countries
- 23 factories on 5 continents

BATA MUSEUM

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The story of Bata shoes in Africa

In 1930, Tomas Bata sent 2 salesmen to Kenya.

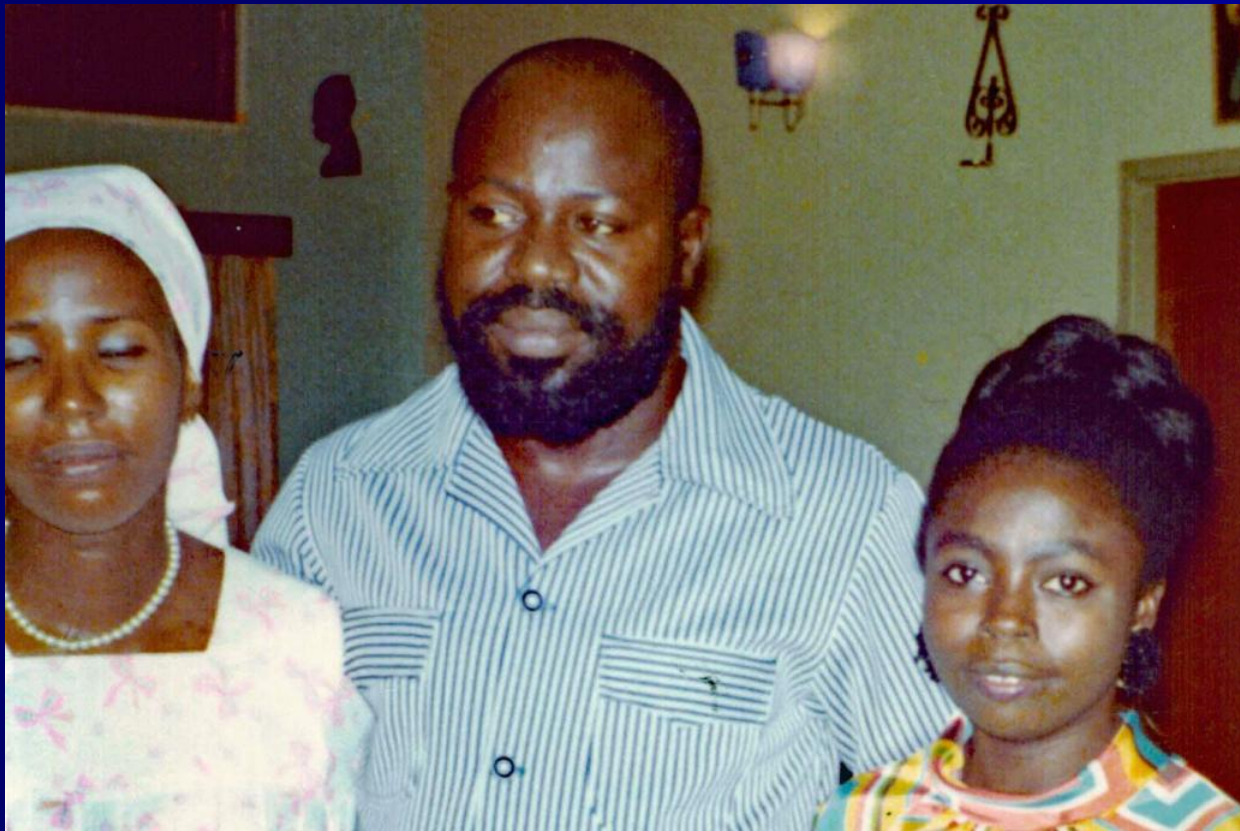
**The first salesman sent a telegram:
“No chance! Nobody wears shoes here!”**

**The second salesman sent a telegram:
“Unlimited opportunity! Nobody wears shoes here yet!”**

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In December 1973, Chief Musa Babatunde Kannike-Martins with his wives visited Escher Wyss in Zurich: “I need a centrifuge!”

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The story of NASCON in Nigeria

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Equipment	Date	Contract Value
Centrifuge	1973	150'000
Washing plant + drier	1973	600'000
Silos + packaging plant	1974	1'600'000
Generator + structures	1975	2'000'000
Erection + spares	1976	650'000
Total		5'000'000

Private communication

NASCON is National Salt Company of Nigeria

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NASCON in 1975 under construction

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NASCON Allied Industries Plc in 2017

- **Owned by Dangote Group, the largest conglomerate in Nigeria;**
- **Imports raw salt from Brazil, Namibia, etc.;**
- **Since 2001 operating salt plant in Apapa;**
- **Since 2003 operating Port Harcourt salt refinery;**
- **Additional production in Oregun;**
- **Total production 600'000 tpa of refined salt;**
- **Brand names Dangote® and Annapurna®;**
- **Expansion to 700'000 tpa announced in 2017.**

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Salt refining companies in Nigeria in 2016

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Nigerian salt refining companies	Annual refining capacity (tpa)
NASCON (National Salt Co. of Nigeria)	600'000
Royal Salt Co. Ltd.	400'000
Jubilee Salt	100'000
Covenant Salt Co. Ltd.	100'000
Others	150'000
Total	1'350'000

Private communication

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**Aliko Dangote, the owner of Dangote Group
is considered to be the richest man in Africa**

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Picture: Dangote website

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African salt production statistics

Out of 54 African countries, 30 report salt production figures. For full record of the published figures refer to www.salt-partners.com.

Statistics are published mainly by US Geological Survey (USGS) and British Geological Survey. These agencies rely on reports sent to them by the competent departments of the national Governments. As shown on Kenya example (below), these reports are not reliable.

Salt production figures quoted herewith are based on reports by USGS. Parties intending to invest in salt business in Africa in reliance to statistics are advised to conduct their own research or entrust the research to well-informed, reputed and reliable entities.

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Largest salt producing countries in Africa 1970-2015

Country	1970	1985	2000	2015
Egypt	420'000	923'000	1'200'000	2'200'000
Tunisia	330'000	405'000	662'000	700'000
Namibia	110'000	154'000	523'000	650'000
Botswana	1'000	1'000	185'000	525'000
South Africa	370'000	723'000	346'000	500'000
Morocco	45'000	105'000	203'000	425'000
Other	883'000	1'118'000	924'000	1'186'000
Total	2'159'000	3'429'000	4'043'000	6'186'000

Source: USGS

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Salt production in the World and in Africa 1970-2015

Salt production	1970	1985	2000	2015
World total	146'600'000	176'400'000	216'600'000	294'900'000
Africa total	2'159'000	3'429'000	4'043'000	6'186'000
World growth	100%	120.3%	147.7%	201.2%
Africa growth	100%	158.8%	187.3%	286.5%

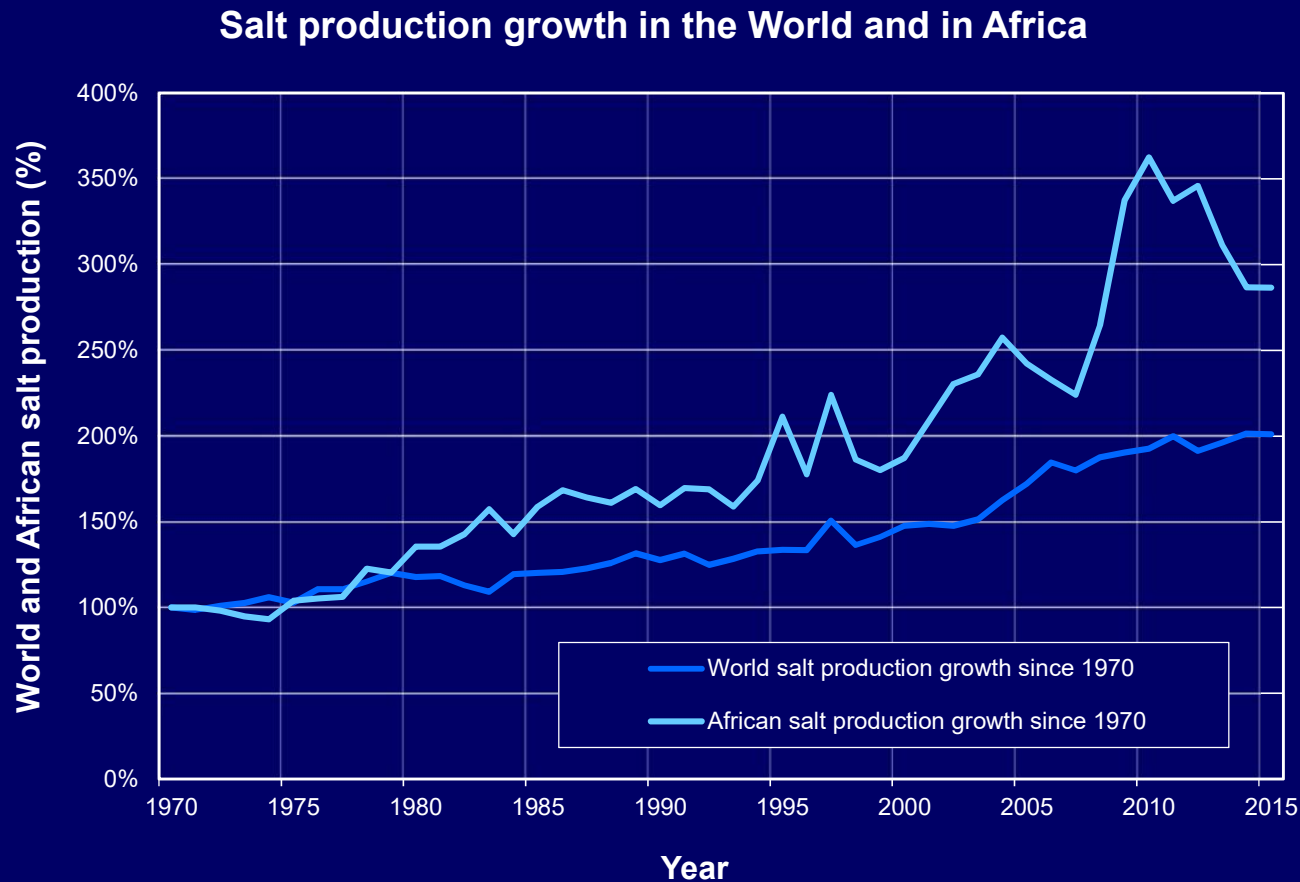
Source: USGS

**Source: National Ministries of Mines, Geological Departments
Publicly reported through US Geological Survey**

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Salt production growth in the World and in Africa between 1970-2015

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Between 1970-2015, world salt production has more than doubled, equal to 1.6% growth rate par annum. In Africa it almost tripled, equal to impressive 2.4% per annum.

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Source: USGS

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Population and population growth in the World and in Africa between 1970-2015

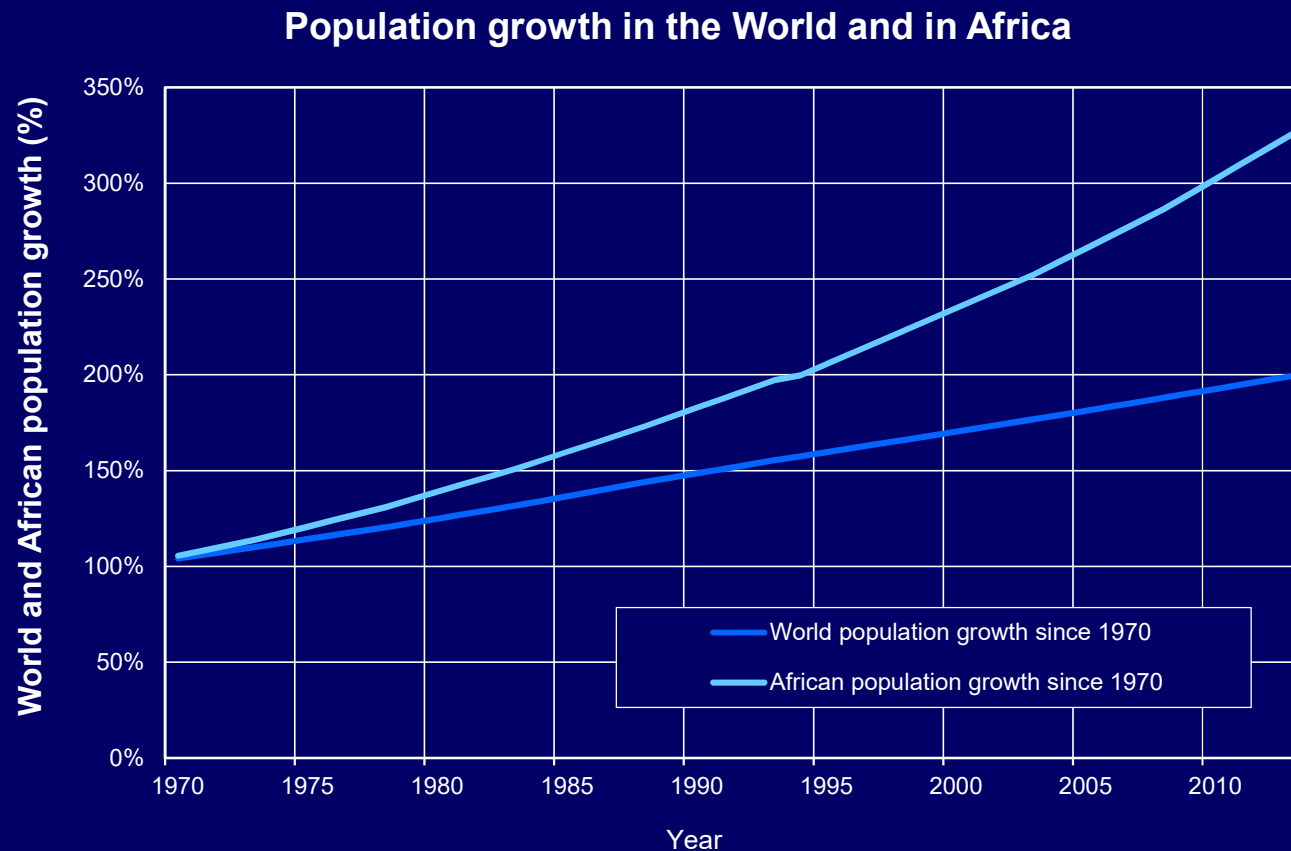
Population	1970	1985	2000	2015
World total	3'700'578'000	4'873'781'000	6'145'007'000	7'383'009'000
Africa total	366'459'000	552'800'000	817'566'000	1'194'370'000
World growth	100%	132%	166%	200%
Africa growth	100%	157%	223%	326%

Source: UN DESA, Population Division

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Population growth in the World and in Africa between 1970-2015

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Between 1970-2015, world salt population has doubled, equal to 1.6% growth rate per annum. In Africa it more than tripled, equal to 2.7% per annum.

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Per capita salt production the World and in Africa 1970-2015

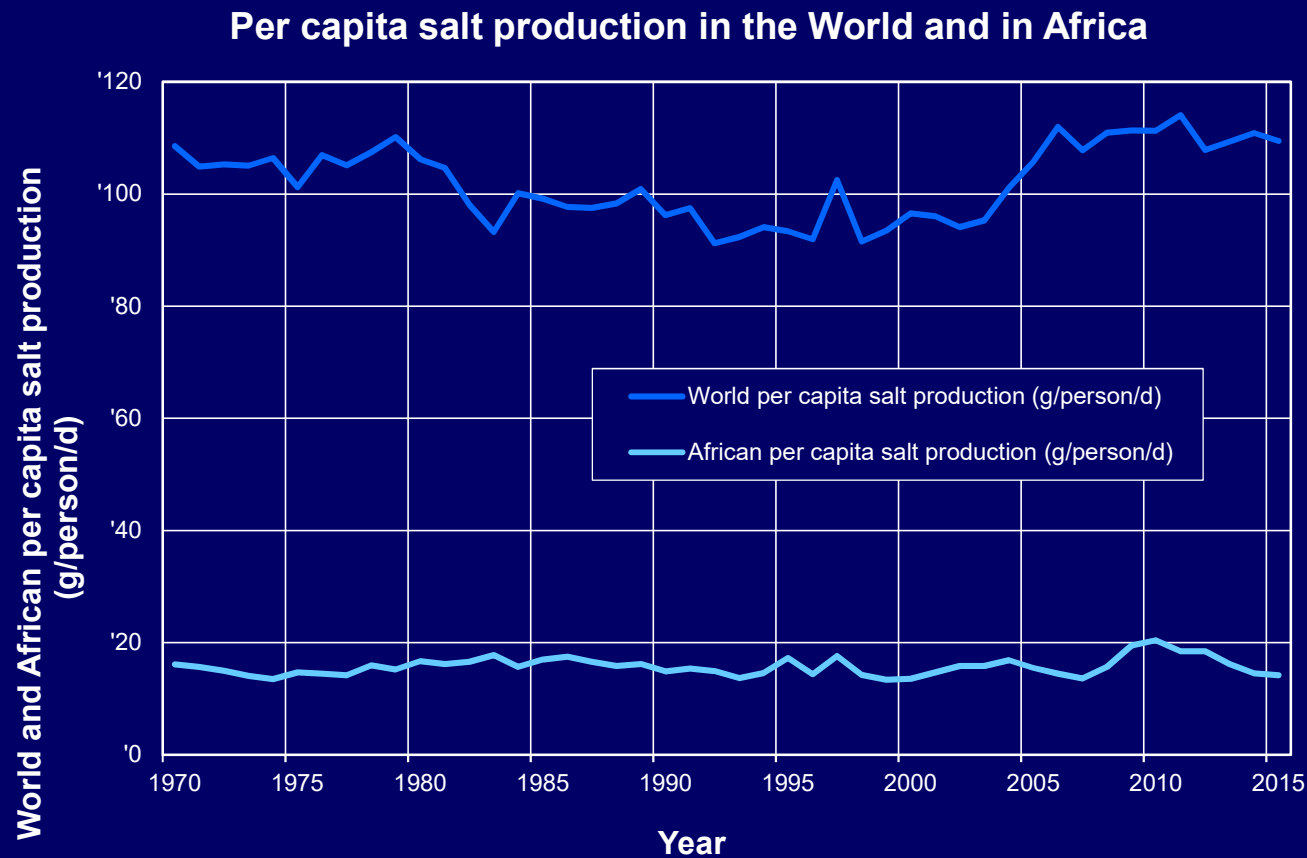
Per capita salt production	1970	1985	2000	2015
World production	109	99	97	109
African production	16.1	17.0	13.5	14.2

Figures are in gram per person per day

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Per capita salt production in the World and in Africa between 1970-2015

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Between 1970-2015, world per capita salt production has been fluctuating by about +/- 10% and stagnating. In Africa, the per capita salt production has been also fluctuating by about +/- 10% but has been overall declining.

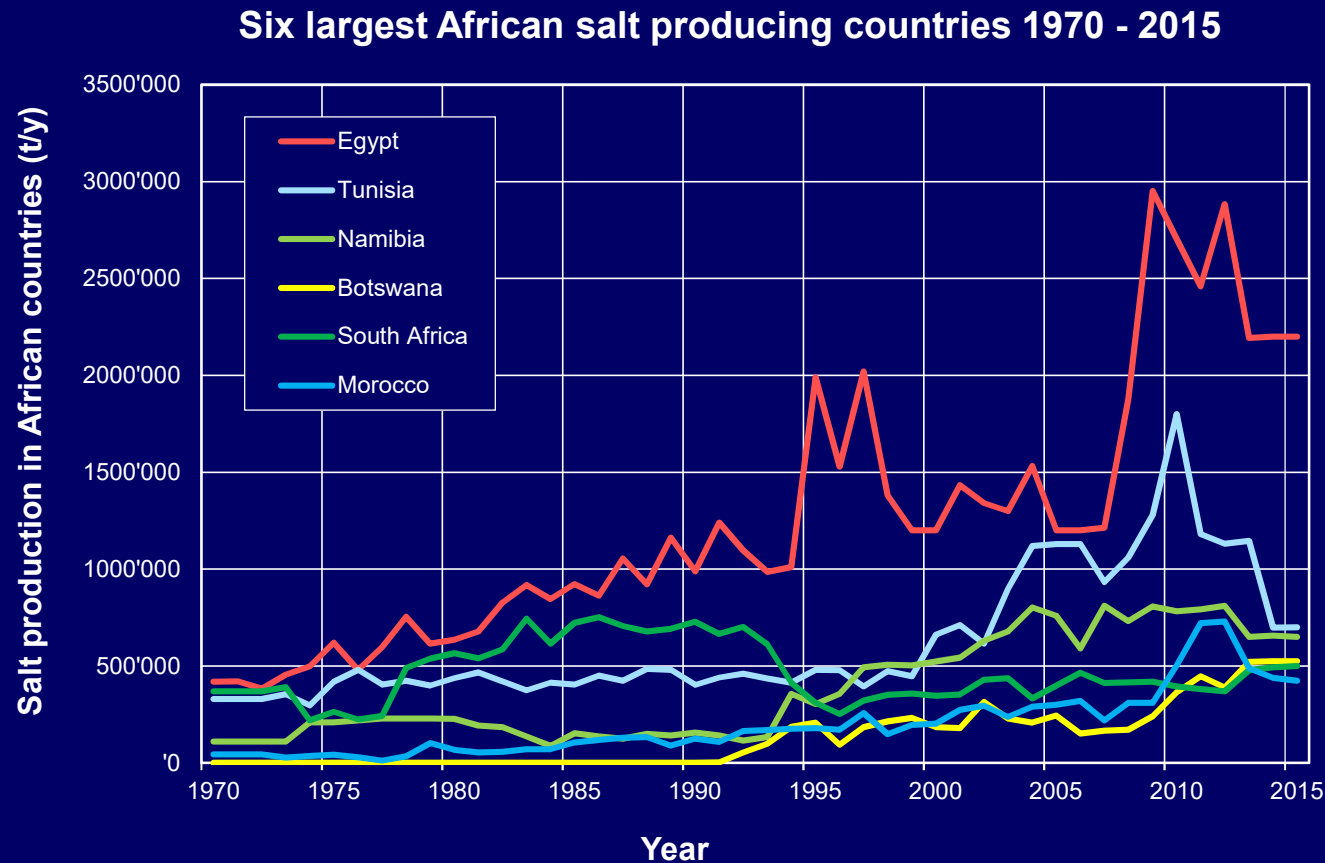
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Comments on African salt production

- **African salt imports (Nigeria) are about equal to exports out of Africa (Egypt). Thus African production is about equal to consumption;**
- **Minimum human physiological salt intake, required for bare survival, is 5 – 10 g / day and more in hot Africa;**
- **Some 90% of world salt production is available for making materials that enhance comfort and standard of life (Glass, PVC);**
- **African salt production / consumption just about facilitates bare survival. Any production growth is absorbed by growing population. The salt production figures show stagnation and even deterioration.**

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Salt production in six leading African salt producing countries between 1970-2015



Between 2007 and 2010, Egyptian salt production more than doubled. Also Tunisian and Moroccan salt production shot up. This was due to high demand for de-icing salt during the harsh winters in Europe and in the USA.

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Source: USGS

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Egypt, Siwa Oasis and Damietta Export Port



800 km from Siwa Oasis to Damietta Port to export de-icing salt to Europe and USA is only competitive if diesel price is subsidised by the Government of Egypt. Under conditions of normal market economy, this salt supply would not be economically sustainable.

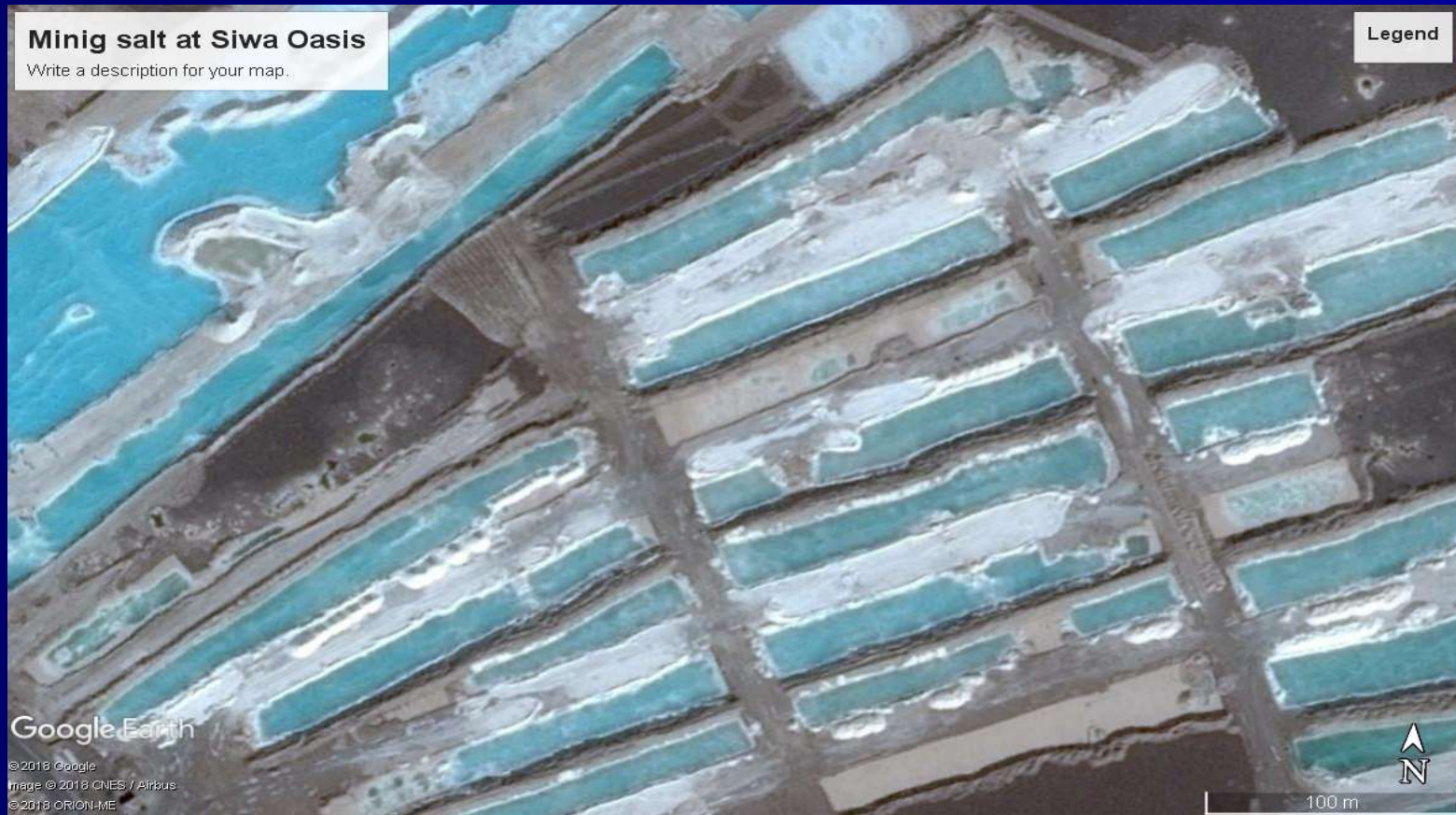
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Egypt, salt mining at the Siwa sabkha

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Tunisia, salt producers and locations of solar saltworks



COTUSAL:

- Sousse
- Sfax
- Zarzis

SOTUSEL:

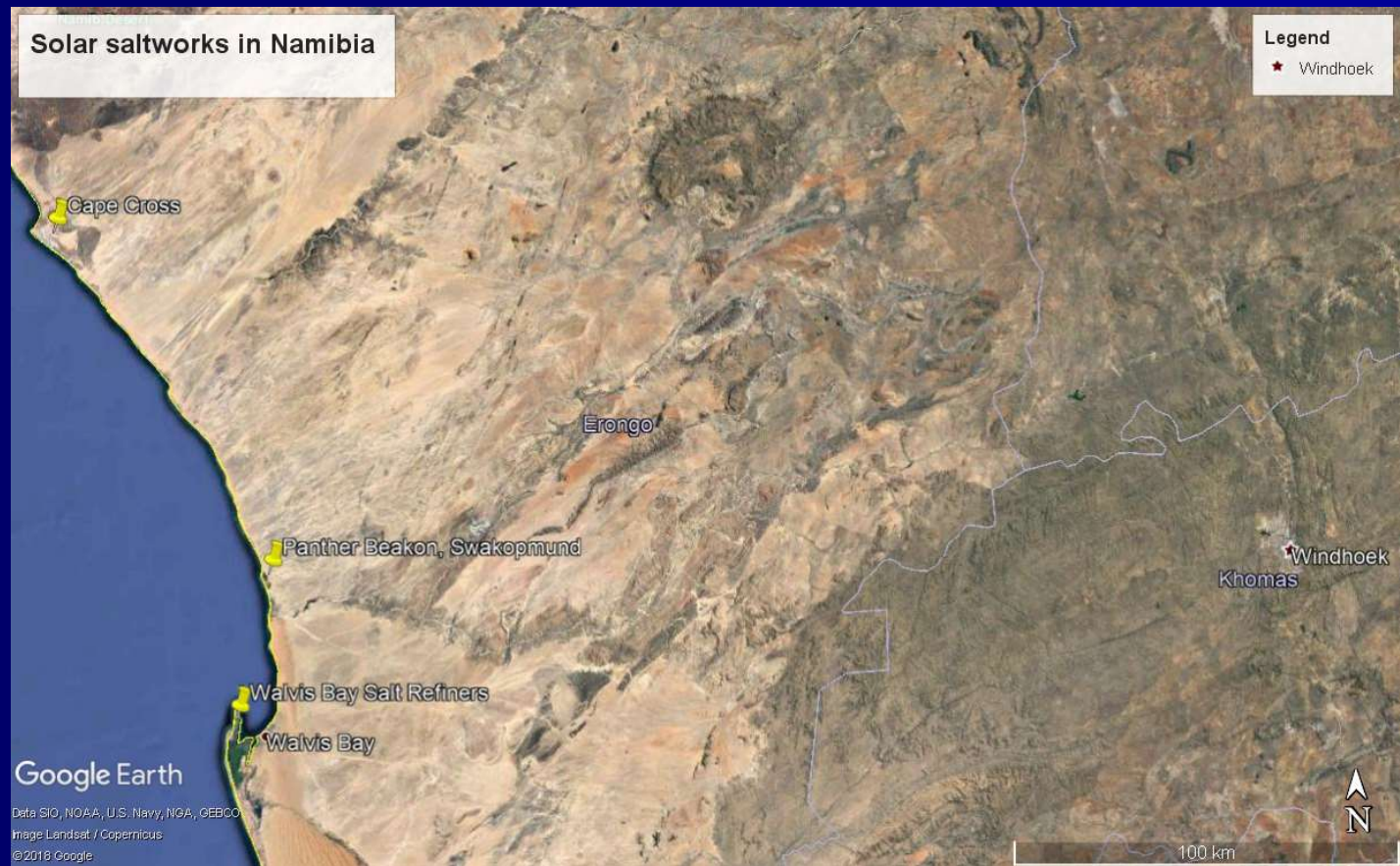
- El Hani
- Tozeur

TUNISEL:

- Adhilbate

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Namibia, locations of solar saltworks at
Cape Cross, Swakopmund and Walvis Bay



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Quality of Walvis Bay salt for chloralkali manufacture compared with the “Australian Standard”

Component	Chemical Grade (Maximum)	Chemical Grade (Typical)	Australian Standard
Calcium	< 0.1 %	0.06 %	< 0.04 %
Magnesium	< 0.1 %	0.05 %	< 0.02 %
Sulphate	< 0.5 %	0.27 %	< 0.12 %
Insolubles	< 0.2 %	0.08 %	< 0.02 %
Ca : Mg ratio	> 1.5 : 1	1.22 : 1	> 2 : 1

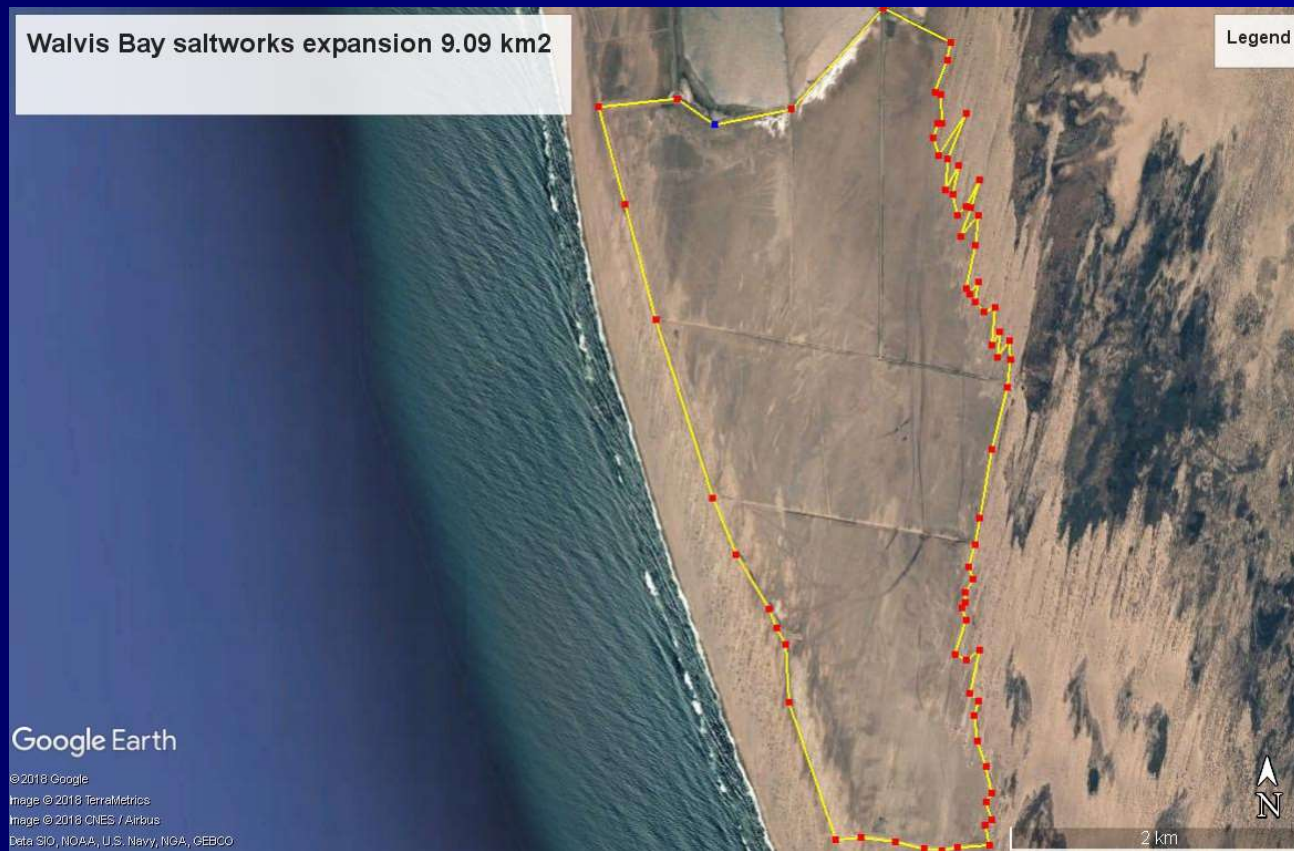
WBSR website 2018

Walvis Bay salt quality is one of the best in Africa. However, it is below the standard for chloralkali manufacture using membrane cells.

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Walvis Bay Salt & Chemicals (Pty) Ltd salt pans expansion under construction

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In 2015, the Board of Walvis Bay Salt Holdings approved plans to expand capacity to 1'000'000 t/y

The expansion of the sea water evaporation ponds to the south of the existing saltworks is under construction.

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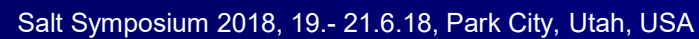
Saltworks established in Kenya between 1928 - 2015

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- **Mombasa Salt Works**
- **Magadi Salt**
- **Salt Manufacturers / Kensalt**
- **Kurawa Industries**
- **Malindi Salt Works**
- **Krystalline Salt**
- **Crystal Salt**
- **Kurawa Salt Works**

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Locations of solar saltworks in Kenya in 2017



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Design parameters of solar saltworks in Kenya

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Saltworks	Area (km2)	Design Capacity (tpa)
Magadi Salt	1.91	45'000
Krystalline North	3.59	
Krystalline South	18.04	280'000
Kensalt North	10.5	
Kensalt Middle	2.87	
Kensalt South	3.76	200'000
Total	40.67	525'000

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Productivity of solar saltworks in Kenya

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	Units	Magadi Salt	Krystalline Salt	Kensalt
Saltworks area	(km ²)	1.91	21.63	17.13
Design capacity	(tpa)	45'000	280'000	200'000
Design yield	(t/km ²)	23'600	12'900	11'700
Actual production	(tpa)	25'000	200'000	165'000
Actual yield	(t/km ²)	13'100	9'200	9'600

Source: Private communication

9'600 t/km² is low compared with 40'000 t/km² in Australia.

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Kensalt solar sea salt

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In Kenya, as in most African solar saltworks, salt is produced, harvested and handled manually.

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Picture: Debesh Sengupta

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Kensalt vacuum recrystallised salt plant

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**Kensalt
refining
plant in
Mombasa
is one of
the very
few
vacuum
salt plants
in Africa.**

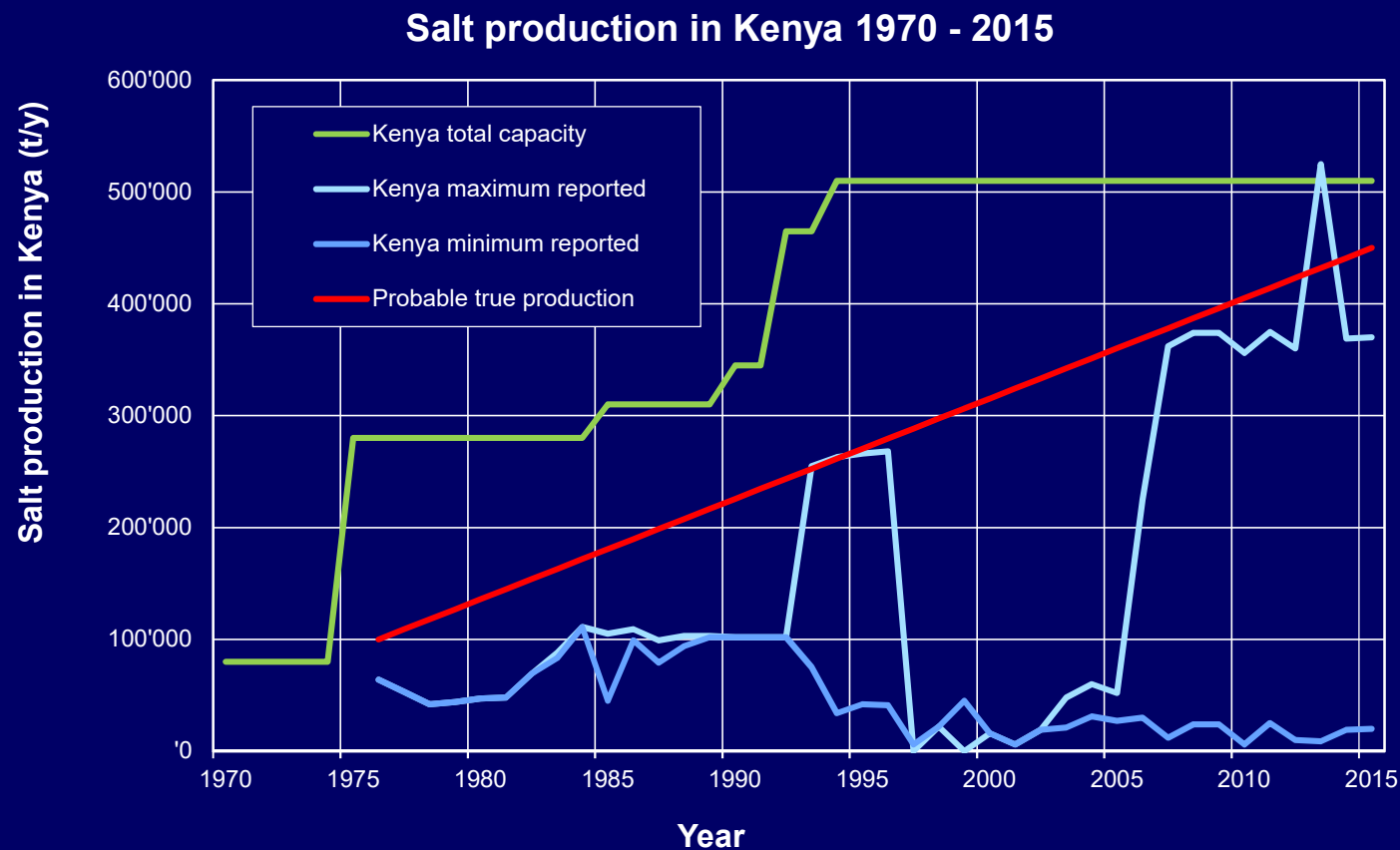
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Picture: Debesh Sengupta

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Salt production in Kenya between 1970-2015

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For years, Kenya Ministry of Mines declared salt production by Magadi Salt as being the total salt production of Kenya.

Probable true production was much higher.

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World bulk salt trade has been lowest to and from Africa



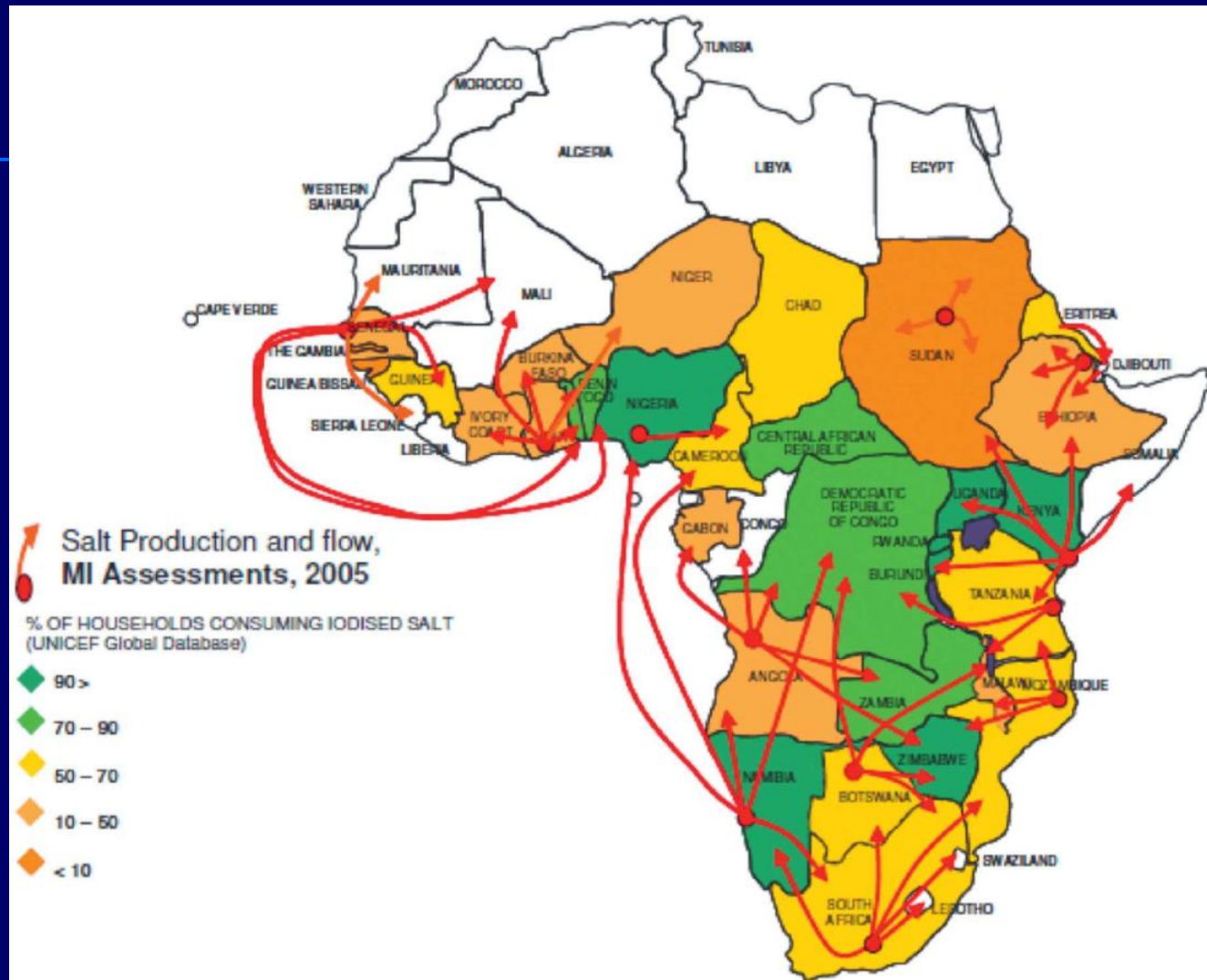
World Trade Atlas, SALT PARTNERS

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Inter-African salt trade



Substantial quantities of salt are being shipped to the landlocked African countries, by trucks on bad roads.

Transport cost and salt prices are accordingly high.

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Kenyan refined table salt prices, delivered, in USD/t

	Delivered from Mombasa to			
Ex works Mombasa	Tanzania	Uganda	Malawi	Zambia
170	200	250	337	350

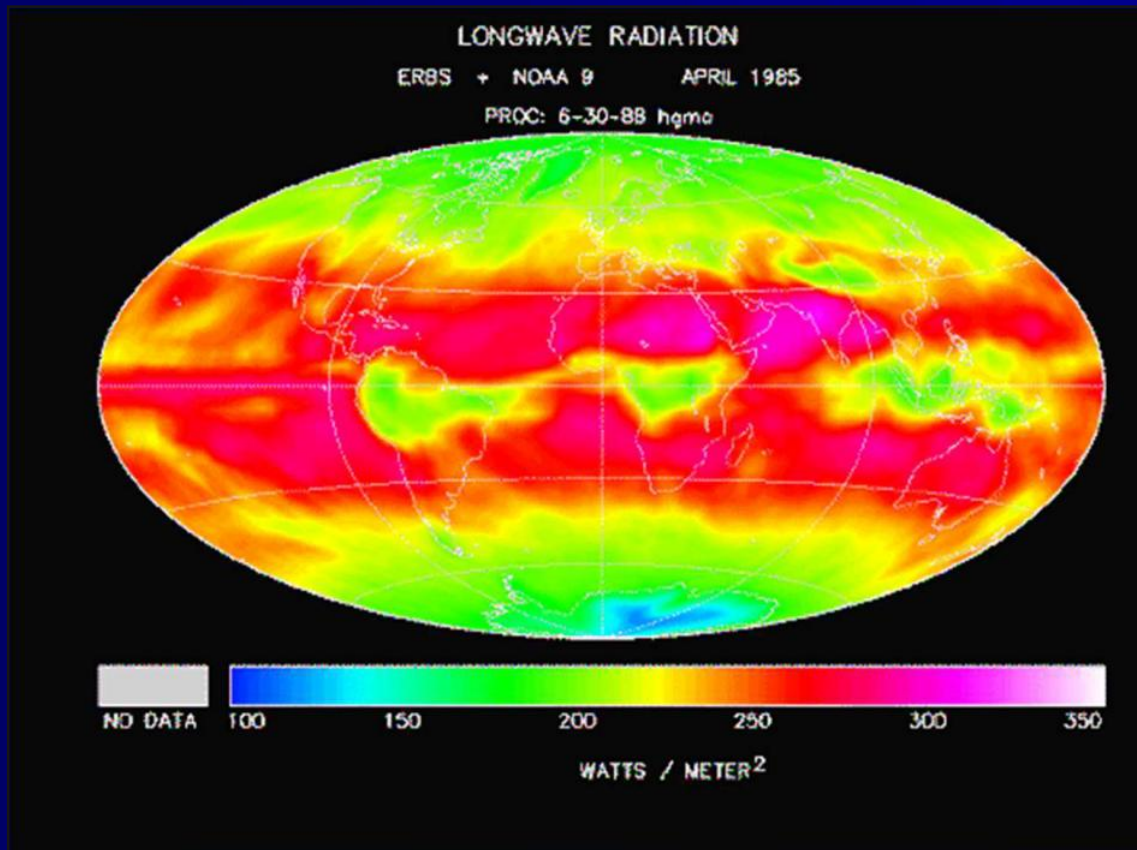
Source: Private communication

In Africa, the salt prices rise with the distance from the sea shore and from the producer.

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Solar Energy (Insolation) on the Planet Earth

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The Earth is receiving approx. 1'368 W/m² of solar energy. Part of the solar energy is absorbed by the clouds. No solar energy is received during the night. Thus the solar energy received on the planet surface – the insolation – is only a fraction of the total solar energy received.

Africa is among the regions receiving most insolation. Therefore, it avails of many locations particularly suitable for efficient solar salt production.

NASA

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Conclusions

Africa is the world's poorest continent. The gross domestic product (GDP) is USD 3'300 per capita. Africa has 140'000 USD millionaires but 36% Africans live on less than 1 USD per day.

The African GDP growth is about 5% per annum. The population growth is about 2.5% per annum. At the GDP per capita growth of 2.5% a person earning USD 1 per day will earn USD 2 per day in 30 years!

Africa is a continent of great opportunities. Some African locations are exceptionally well suited for efficient solar salt production. Yet, investors hesitate because economic policies are unpredictable.

It lies in the hands of African political establishment to create economic conditions that would turn the existence of promising locations into opportunities for sustainably profitable salt production.

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So, why not turn your salt into gold?



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