



Presentation on Water Supply activities within Cuvelai Basin

By NamWater



Introduction

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Loy out of Cuvelai-Etосha Basin





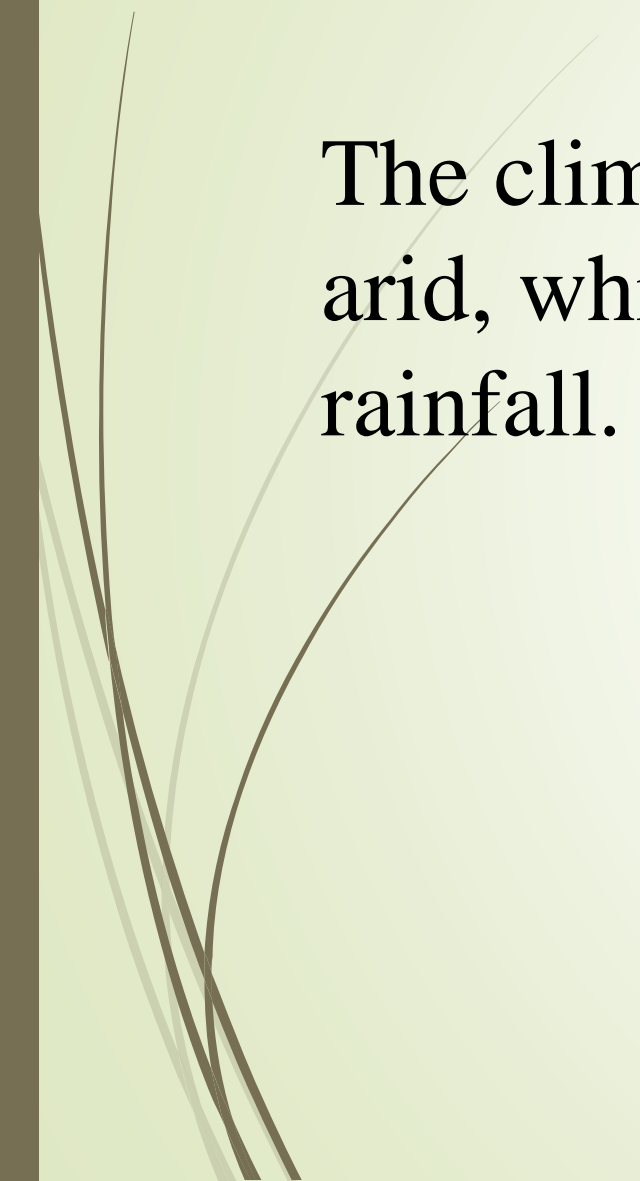
Background of Cuvelai Basin

- The Cuvelai basin is located on the northern central part of Namibia. It forms a delta that drains from southern Angola and brings water to Namibia, and gradually converges into the Etosha Pan. On average, high floods of four in every ten years occur. Local rains also contribute to surface flow in the basin.

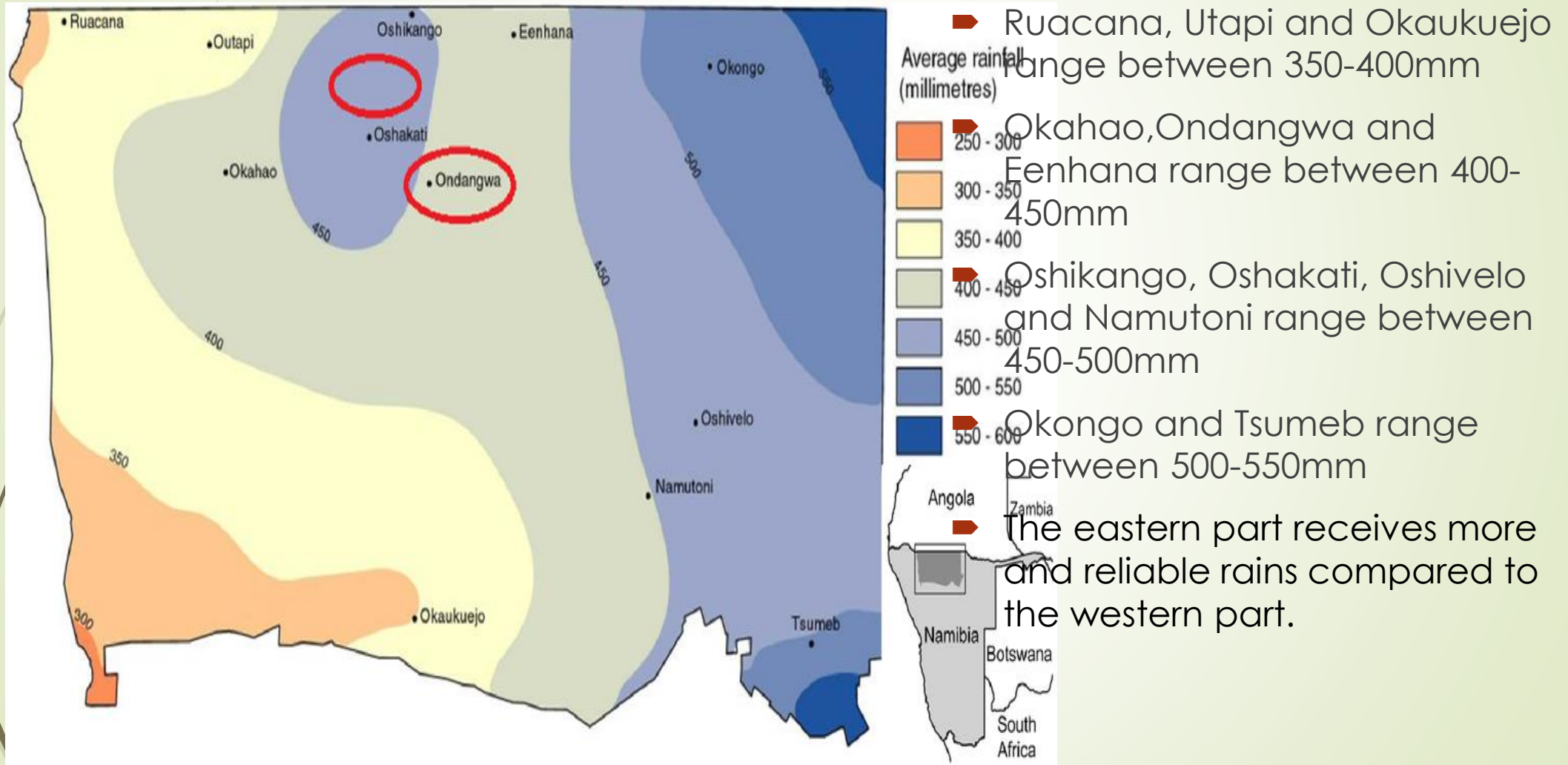


Climate

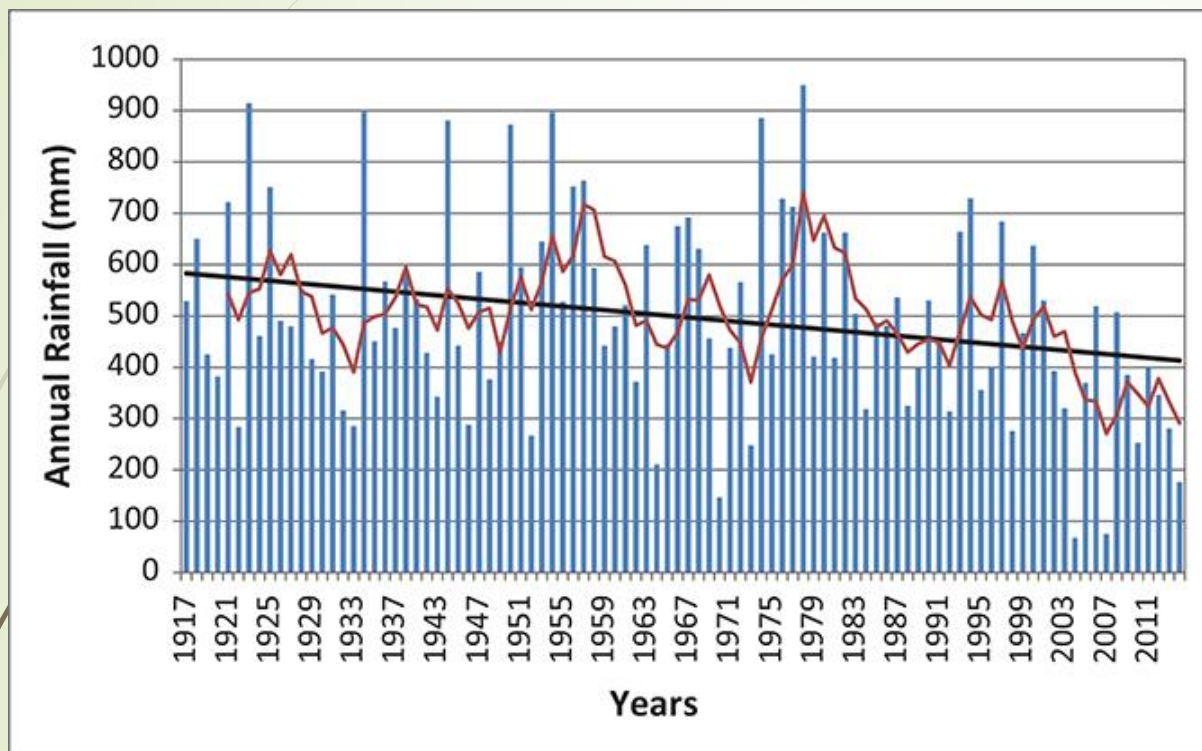
The climate in the basin is that of semi-arid, which is characterised by variable rainfall. Summer rains occurs the most.



Rain fall patterns in Northern Namibia



Rain variations

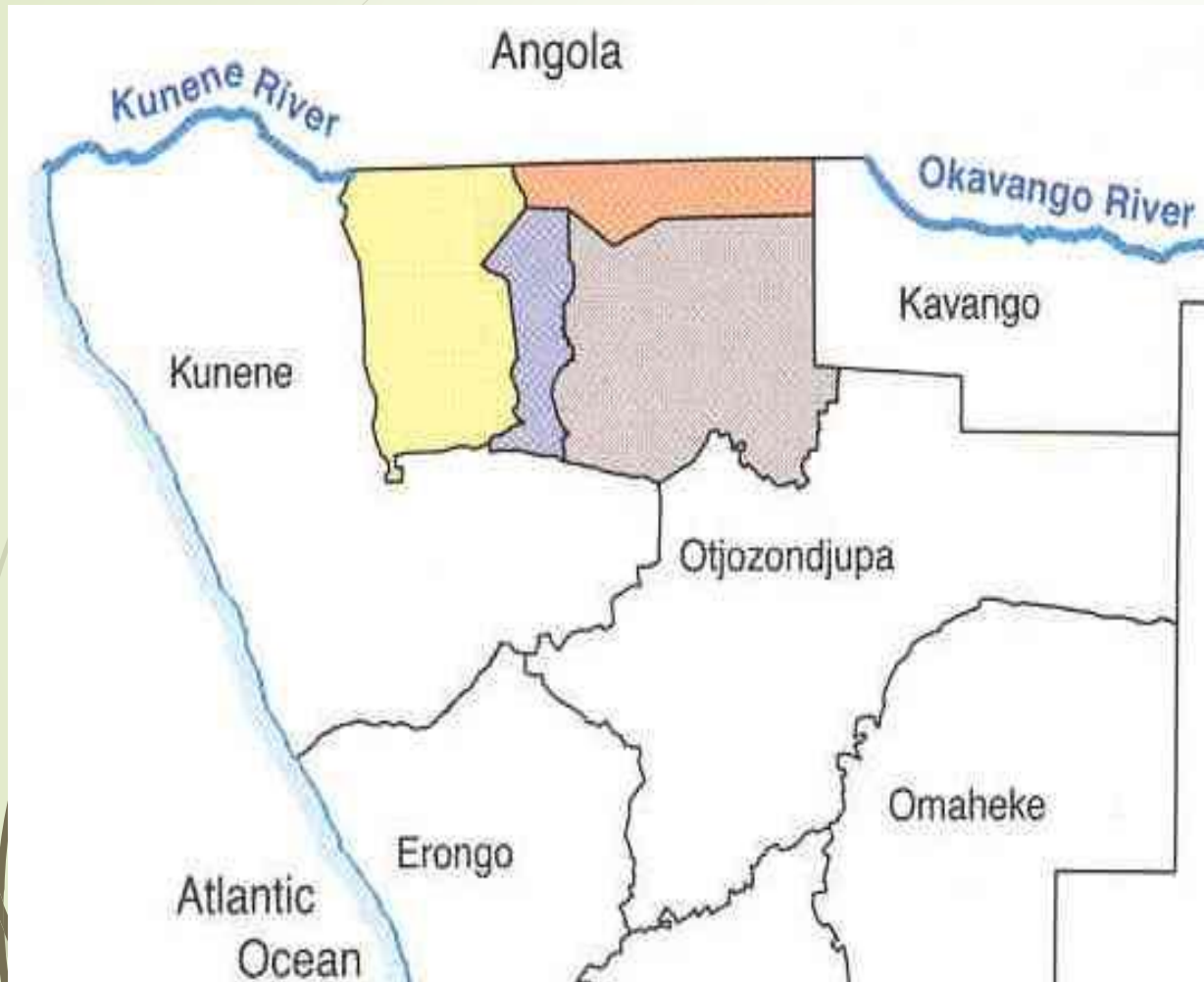


Source: Data from Namibia Meteorological Service (NMS), 2015b, *Namibia meteorological service*, viewed 16 June 2015, from <http://www.meteona.com/>

FIGURE 6: The annual rainfall of Grootfontein from 1917 to 2014 with a least square linear regression and 10-year moving average trend lines.

- In this graph the rain fall variation is quite significant
- A notable reduction in the rain fall since year 2003
- These conditions are not only happening in the Grootfontein area but even in the northern Namibia
- As a result of the rain variations, drought conditions are being experienced

Source of Water



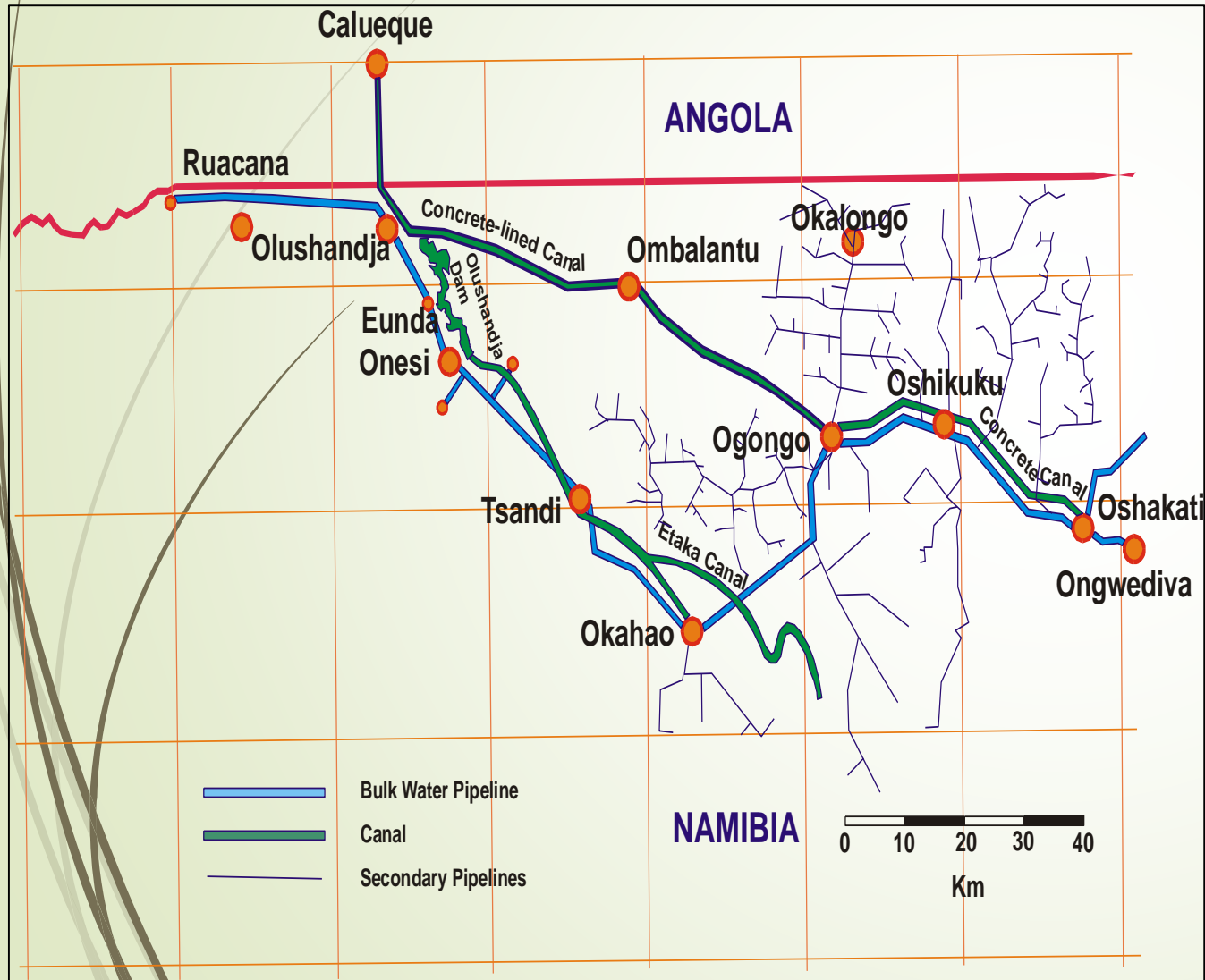
- The source of water is Calueque dam on the Kunene river located in Angola.

Water conveyance from Calueque



- Water is conveyed from Calueque to NamWater purification facilities by means of the open canal

Calueque-Oshakati Supply network



➤ Raw Water from Calueque is delivered to NamWater treatment plants, for treatment purposes. Which are:

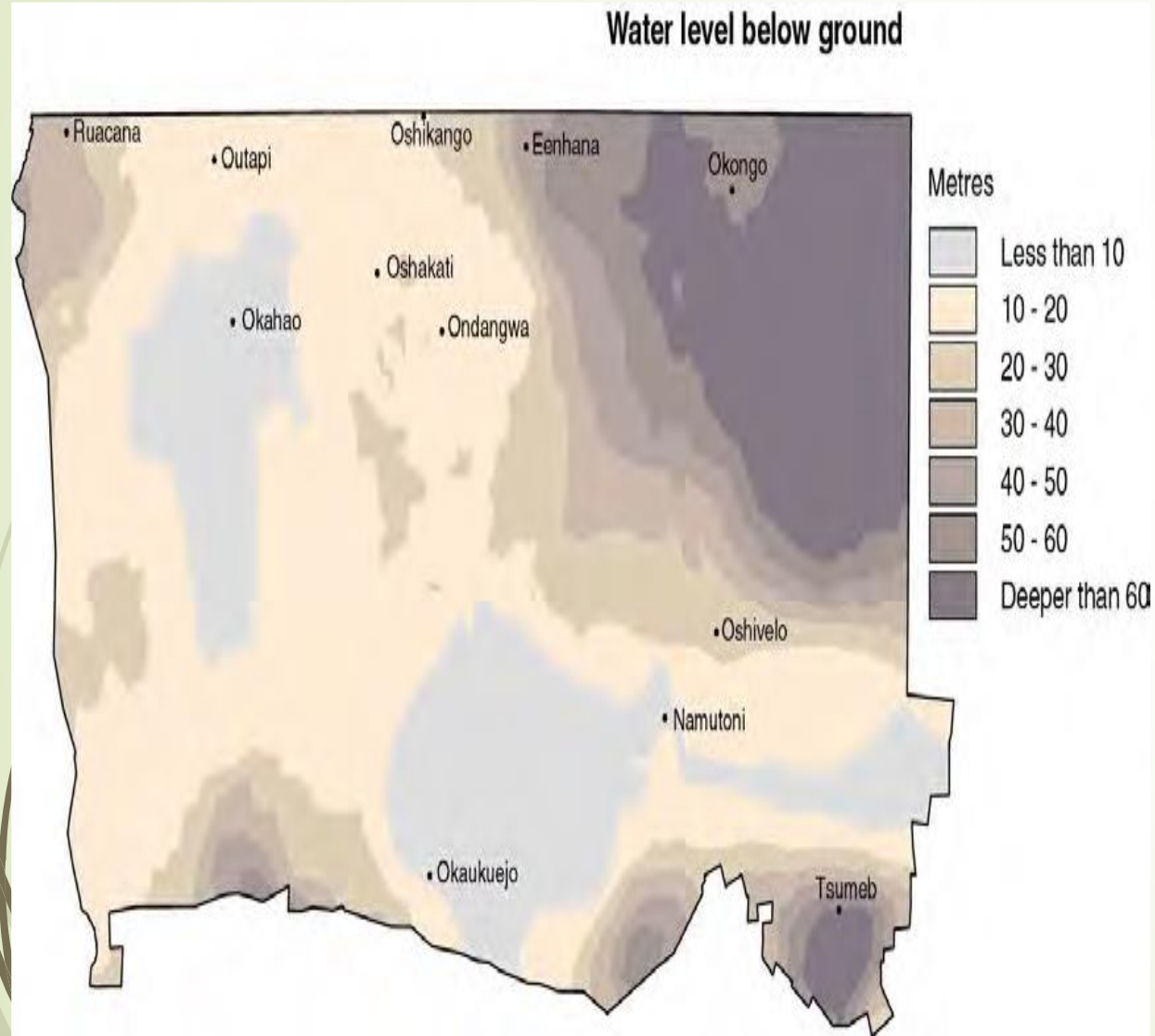
- Olushandja
- Ombalantu
- Ogongo
- Oshakati

KUNENE AGREEMENTS

- **1886** **First Border Agreement**
- **1926** **Second Border Agreement**
- **1926** **First Water Use Agreement**
- **1964** **Second Water Use Agreement**
- **1969** **Third Water Use Agreement**
- **1990** **Fourth Water Use Agreement**
- **1991** **Fifth Water Use Agreement**

- These agreements are meant to harmonies and regulate the usage of the Kunene river, between Angola and Namibia.
- And it is believed that with these agreements in place the supply of water for human consumption will be sustained.
- In comparison with the central area, the water supply within the Cuvelai Basin is credible.

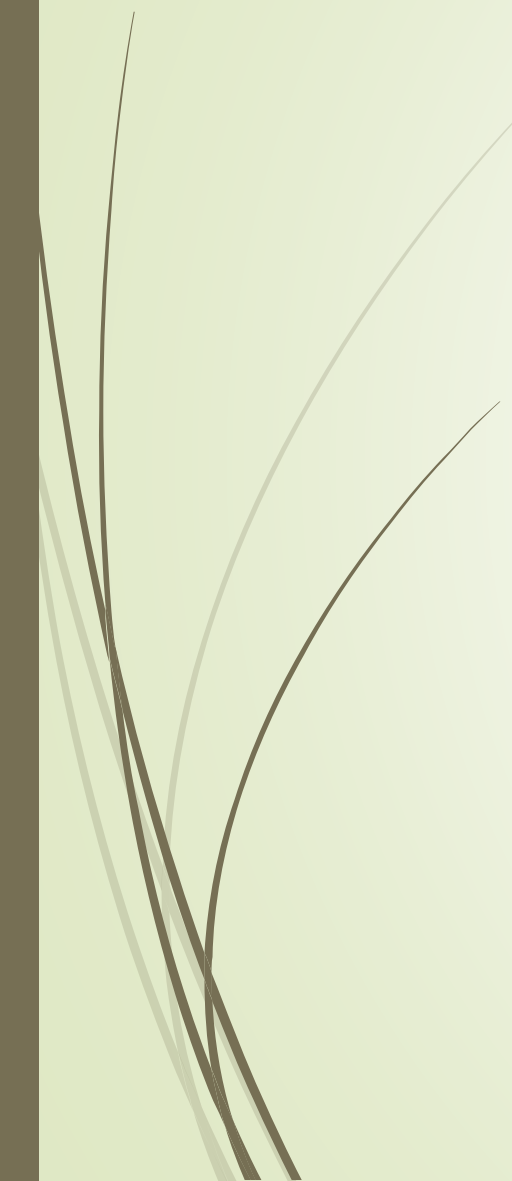
Ground water



- Namibia have now identified a new aquifer called Ohangwena II, which flows under the boundary between Angola and Namibia.
- This newly discovered water source could have a major impact on development in the country
- Estimates suggest the aquifer could supply the north of the country for 400 years at current rates of consumption.
- Scientists say the water is up to 10,000 years old but is cleaner to drink than many modern sources.
- However, there are concerns that unauthorised drilling could threaten the new supply.



Ground Water continues

- ▶ One of the biggest advantages of the new aquifer could be in helping people cope with climate change.
 - ▶ The researchers estimate that it could act as a natural buffer for up to 15 years of drought.
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Availability of water in Cuvelai basin compared to Central Area

- Despite the low rain fall being experienced lately in the Cuvelai Basin, water supply to both communities and towns is still available.

Weekly dam bulletin

NAME OF	Full	Lowest	Present	Present	Present	Change	Content	% of Full	Volume	%		
	Supply	Abstraction	Water	Content	% of	Since Last	One Week	Capacity	Last	Last	Weekly	
RESERVOIR	Level	Capacit y	Level	Capacit y	Stage	Full	Bulletin	Ago	One Week	Season	Season	Rainfall
	(m AMSL)	(Mm ³)	(m AMSL)	(Mm ³)	(m AMSL)	(Mm ³)	Capacity	(Mm ³)	(Mm ³)	Ago	(Mm ³)	(mm)
*SWAKOPPOORT DAM	1135.00	63.489	1115.70	1.431	1121.30	6.611	10.4	-0.031	6.642	10.5	20.883	32.9
VON BACH DAM	1350.00	48.560	1329.50	2.073	1337.74	10.513	21.6	-0.096	10.609	21.8	16.968	34.9
*OMATAKO DAM	1359.00	43.499	1353.20	4.073	1351.85	1.400	3.2	-0.083	1.483	3.4	1.555	3.6
SUB-TOTAL CENTRAL		155.548		7.577		18.524	11.9	-0.210	18.734	12.0	39.406	25.3
FRIEDENAU DAM	1649.21	6.723	1633.50	0.391	1640.98	2.048	30.5	-0.014	2.062	30.7	2.957	44.0
GOREANGAB DAM	1585.31	3.621	1574.31	0.010	1585.20	3.521	97.2	-0.045	3.566	98.5	3.621	100.0
SUB-TOTAL WINDHOEK		10.344		0.401		5.569	53.8	-0.059	5.628	54.4	6.578	63.6
SUB-TOTAL CAN		165.892		7.978		24.093	14.5	-0.269	24.362	14.7	45.984	27.7
OTJIVERO MAIN DAM	1575.50	9.808	1561.15	0.066	1570.86	4.100	41.8	-0.065	4.165	42.5	6.521	66.5
OTJIVERO SILT DAM	1576.00	7.795	1568.98	0.096	1570.74	0.349	4.5	-0.008	0.357	4.6	2.948	37.8
TILDA VILJOEN DAM	1436.04	1.224	1425.71	0.028	1431.30	0.496	40.5	-0.010	0.506	41.3	0.684	55.9
DAAN VILJOEN DAM	1432.22	0.429	1426.00	0.000	1430.60	0.177	41.3	-0.009	0.186	43.3	0.290	67.6
SUB-TOTAL GOBABIS		19.256		0.190		5.122	26.6	-0.092	5.214	27.1	10.443	54.2
HARDAP DAM	1135.00	294.593	1114.80	4.299	1127.05	113.605	38.6	-0.856	114.461	38.9	163.708	55.6
NAUTE DAM	732.00	83.580	711.30	1.320	731.18	74.632	89.3	-0.413	75.045	89.8	78.006	93.3
OANOB DAM	1453.00	34.505	1424.50	0.417	1443.40	11.780	34.1	-0.106	11.886	34.4	16.874	48.9
DREIHUK DAM	895.00	15.493	884.13	0.206	empty	0.000	0.0	0.000	0.000	0.0	0.000	0.0
BONDELS DAM	947.56	1.103	944.70	0.007	empty	0.000	0.0	0.000	0.000	0.0	0.000	0.0
SUB-TOTAL SOUTH		429.274		6.249		200.017	46.6	-1.375	201.392	46.9	258.588	60.2
OLUSHANDJA DAM	1106.00	42.331	1101.50	0.000	1104.25	10.633	25.1	0.000	10.633	25.1	11.044	26.1
OMARURU DELTA DAM	262.20	37.389	242.96	0.000	empty	0.000	0.0	0.000	0.000	0.0	0.000	0.0
OMATJENNE DAM	1362.92	5.063	n/a	0.000	empty	0.000	0.0	0.000	0.000	0.0	0.000	0.0
TOTAL		699.205		14.417		239.865	34.3	-1.526	241.601	34.6	326.059	46.6



Water shortage in central Area

The City of Windhoek hereby announces that the persistent drought has left the city with little choice but to announce a water crisis scenario in Windhoek in relation to the city's drought management plan.

This was revealed during the announcement that the city's water supplies had reached a critical level with supply dams only holding 15% of capacity.

The Namibian news paper of the 4 December 2015



Thank you

