

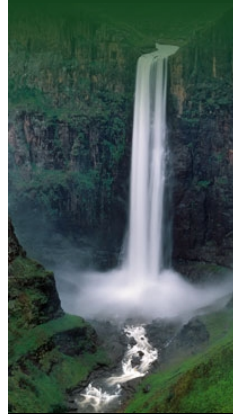


Orange-Senqu River Awareness Kit


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The River Basin

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Hydrology of the Orange-Senqu River Basin

Hydrology of the Orange-Senqu River basin varies from one part of the basin to another, in terms of annual rainfall, runoff and evapotranspiration. Given these variable hydrological conditions, combined with human development demands, much of the basin experiences some degree of water stress.

The hydrology of the Orange-Senqu River basin is discussed in the following terms:

- [Surface water](#)
- [Groundwater](#)
- [Water use / water balance](#)
- [Monitoring flow](#)



The Lower Orange River.
Source: Vogel 2009
(click to enlarge)

The mean annual precipitation (MAP) in the Orange-Senqu River basin is approximately 1 800 mm at the source of the river, and declines the further west the river flows until it is less than 50 mm per annum. Runoff in the basin is also highly variable in most rivers due to seasonality and rainfall-run off processes, and available runoff from perennial streams is insufficient to meet high demands. While natural runoff in the basin has been estimated to be approximately 11 600 Mm³/a (ORASECOM 2007f), this value has been drastically modified due to flow regime regulation by major water management infrastructure in the basin.

A major issue in the southern African water cycle is that the mean annual evaporation (MAE) often exceeds the MAP, and the Orange-Senqu River basin is no exception (ORASECOM 2007e). MAE from surface waters in the Upper Orange-Senqu River basin is relatively low (1 400 mm and 2 200 mm); however, evaporation increases as the river runs westwards towards the desert region on the West coast, peaking at between 2 000 mm and 2 400 mm from above Boegoeberg Dam to upstream of Vioolsdrif (ORASECOM 2007e).

The water resources of the Orange Senqu River basin are shared by four countries, with significant portions of each country and national populations contained within the basin boundary. Estimates of the country area within the basin are shown in the table below.

Table: Summary of country area of riparian states within the Orange-Senqu River basin

Country	Area in orange Senqu river Basin(km ²)	Percentage of country in basin (%)	Total Population (country)	Population in the Basin	Percentage of Country Population in the Basin (%)	Percentage of Basin Population(%)
Botswana	79 000	7.9	1680 883	47 667	2.8	0.3
Lesotho	34 000	3.4	2 127 539	2 127 539	100	13.5
Namibia	245 000	24.5	1 830 330	163 093	8.9	1.3
South Africa	642 000	64.2	44 819 778	13 357 298	29.8	84.9
Total	1 000 000		50 458 510	15 738 115		

Source: ORASECOM 2009

The water resources of the Orange-Senqu River basin support a large population and significant economic activities, including mining and agriculture, all of which depend on water for survival and growth. The average annual per capita availability of water in the Orange-Senqu River basin is just above 1 000 m³, categorising the region as water stressed (1 000 – 1 700 m³/year), and placing it just above chronic scarcity (500 – 1 000 m³/year).

Next: Surface Water ➔



Basin Map

Explore the sub-basins of the Orange-Senqu River

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Video Tour

Tour video scenes along the Orange-Senqu River related to the River Basin

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Geography Maps

Investigate land cover and terrestrial ecoregions in the basin

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Water Cycle

Examine how the hydrologic cycle moves water through and around the earth

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Food Web

Explore the interactions of living organisms in aquatic environments

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