



Resource Management

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Water Demand in the Basin: **Water Demand in the Basin**

The **natural runoff** of the Orange-Senqu River basin has been estimated to be 11 600 Mm³/a and a water balance calculation (Table 1, below) states that approximately 11 490 Mm³/a of this water is used (ORASECOM 2007f). These facts and figures all contribute to the current use of the term 'approaching closure' when discussing the Orange-Senqu River basin. This means that despite significant investments and efforts to manage the water resources of the basin, the point at which there will be no more water to allocate and use is rapidly approaching. Meeting the growing needs for development will soon be very difficult unless effective water demand measures are implemented.

Table 1: Water balance in the Orange-Senqu River basin at 2005 development level.

Water Balance Component	Volume (Mm ³ /a)
Environmental Requirement	900 ¹
Namibia	120 ²
Lesotho & Transfers to South Africa	820 ³
South Africa Orange River Demand	2 560 ⁴
South Africa Vaal River Demand	1 560 ⁵
Evaporation & losses	1 750 ⁶
Spillage	3 780 ⁷
Total	11 490
Spillage under natural conditions	10 900

Notes
 (1) – Includes natural evaporation losses from Orange River.
 (2) – Includes water use from Orange & Fish rivers.
 (3) – With Full Phase 1 of LHWP active.
 (4) – Includes transfers to the Eastern Cape.
 (5) – Vaal demand supplied from locally generated runoff.
 (6) – Excludes evaporation losses from the Orange River, as it is already included in component 1
 (7) – Average spillage at 2005 development level
 Source: ORASECOM 2007f

The estimated water balance for natural runoff conditions is also described in the map below.



Approximate water balance for natural runoff in the Orange-Senqu River basin.
 Source: Hatfield 2009, after ORASECOM 2007f
 (click to enlarge)

Please note that unlike the rest of the River Awareness Kit, this map treats the Lower Orange and Molopo/Nossob systems as a single unit; and separates the Fish River sub-basin from the other Northern Ephemeral rivers. Furthermore, the Upper Orange-Senqu sub-basin is separated into the Senqu, the Caledon and the Upper Orange Rivers.

The **current actual runoff** reaching the river mouth is now estimated to be approximately 5 500 Mm³/a (ORASECOM 2007f), which is approximately 48% of the natural runoff described above. Estimates put the demand for water in the basin at 6 500 Mm³/a, with approximately 82% of this use attributed to South Africa (Turton et al 2005).

Table 2 summaries the water requirements of the different sub-basins of the Orange-Senqu River basin.

Table 2: Orange-Senqu system water requirements by catchment.

Catchment	Water Requirements Mm ³ /a
Vaal	2 764
Lesotho	20
Upper Orange	2 526
Lower Orange	175
Total	5 485

Source: adapted from UNDP/GEF 2008

Interactive

Basin Map

Explore the sub-basins of the Orange-Senqu River

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Table 3 provides an estimate of the distribution of water requirements by major water use sector for the entire Orange-Senqu River basin. As can be seen from these data, irrigation is by far the single largest user of water in the basin. River losses describes the estimated volume of water lost to evaporation from the river channel. This high percentage is due to the generally high rate of evaporation experienced in many parts of the basin (exceeding 2 000m/yr in some places; UNDP/GEF 2008).

Table 3: Orange-Senqu River basin water requirements by sector.

Sector	Total water use (%)
Irrigation	58
Urban, industrial and mining	4
River losses	27
Distribution losses	2
Environmental Requirements	9

Source: UNDP/GEF 2008

While these are approximate annual requirements, there is significant monthly variation in flow, distribution and requirements from the different sectors with in the basin (ORASECOM 2007f).

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