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| **TARGET 15.4:** By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes**INDICATOR 6.6.1D(2):** Change in the national discharge of Rivers and Estuaries over time. |
| **Indicator definition and method of computation (MoC)** |
| **DEFINITION:** The total cumulative volume (discharge) of water moving downstream during a hydrological year compared to the naturalised flow set as a baseline. This indicates the reduction from natural flows, obtained by removing man-made influences such as dams, irrigation schemes, abstractions for mines, industry and towns, return flows from treatment works | **MoC:** Change in discharge is measured as naturalised Mean Annual Runoff minus present day mean annual runoff divided by naturalised mean annual runoff times one hundred:Cf = (nMAR-pdMAR)/nMAR x 100Where Cf = % reduction in dischargenMAR = Naturalised flowpdMAR = Present day flow  |
| **Baseline indicator value: Rivers: 30%** **Estuaries: 33%**  |
| Source**:** Council for Scientific and Industrial Research (Estuaries), Department of Water and Sanitation and Water Research Commission (Rivers)  |
| **Comments:**Flow in 2016/17 for estuaries represents a 33% reduction from natural flows (nMAR). There should be no further decrease in MAR. The latest available data for present day flows (pdMAR) in South Africa’s Rivers is for 2010 (34 430 million m3/a) and represents a 30% reduction from nMAR. Estuaries data is sourced from Van Niekerk L; Taljaard S; Ramjukadh C-L; Adams JB; Lamberth SJ; Weerts S; Petersen C; Audouin M; Maherry A. 2018. A multi-sectoral resource planning platform for South Africa's estuaries. WRC report TT 748/18. <https://ms-gis.csir.co.za/portal/apps/MapSeries/index.html?appid=aec107714c4743c7829ec6edd0247d3d>Rivers data is sourced from Pitman, WV and Bailey, AK. 2015. Water Resources of South Africa. 2012 Study (WR2012). WRC Report K5/2143/1 (<http://waterresourceswr2012.co.za/resource-centre/>). Naturalised flows are as for 1920 to 2009 hydrological years.  The present day has all land use/water use set from 1920 to 2009 as at the 2009 hydrological year (Oct 2009 to Sep 2010). The latest data shows that cumulative flows from 32 key flow gauging stations for rivers for the 2016/17 hydrological year equates to 26 830 million m3/ annum. Further modelling is required to determine the latest pdMAR and the % reduction from nMAR for rivers. |