

THE THEEWATERSKLOOF WETLANDS STUDY

There are three wetlands that surround the Theewaterskloof Dam; namely the Du Toit's River Wetland, the Elandskloof Wetland and the Vyeboom Wetland. The state of these wetlands surrounding the Theewaterskloof Dam are impacted by farming and flows from the town of Villiersdorp, which affects the quality of water flowing into the dam. The Theewaterskloof is the largest dam in the Western Cape and is one of the main sources of water to the City of Cape Town.

Therefore, it is important that we understand the flow of water; from the rain falling on the surrounding mountain catchment areas to the value of these wetlands, in filtering the water before the water enters the Theewaterskloof Dam.

For example, on the western side of the dam where the Vyeboom Wetland is, is erosion, that is lessening the future value (flow of water) over time. It is thought that, if this loss of value over the next fifty years is understood in monetary terms, then government, organisations and the community will understand the economic balance of spending money to restore these wetlands.

THE STUDY

As a result, the study of the value of the Theewaterskloof Dam wetlands was commissioned by our Chief Directorate: Environmental Quality, under Gottlieb Arendse, Wilna Kloppers and Anabel Horn. The study was done this year and completed in November 2019.

A team under **EScience Associates** was appointed to carry out the study on the value of the wetlands of the Theewaterskloof Dam, which included a hydrologist, a wetland scientist and an economist.

The hydrological modelling of this study has shown that almost 30% of the Western Cape

Water Supply System is filtering through the three wetlands. The Vyeboom Wetland is impacted by flows from agricultural lands, such as pesticides, herbicides and fertilisers, while the Elandskloof Wetland is affected by both agriculture and flows from the town of Villiersdorp, including water from the informal settlement and the waste water treatment works.

The significance of the inclusion of the Du Toits Wetland is that it is essentially a pristine wetland, that then acts as a comparison with the other wetlands, offering an indication of how wetlands in the area would have cleansed water before human interference.

It was found that about 80% of all water inflows into the Theewaterskloof Dam, flow through these wetlands, which is important in a rainfall region of between 2000 and 3000 mm per year. Therefore, an indirect value method of determining the worth of the wetlands was used in an economic model, which linked to the hydrological model of the Theewaterskloof Wetlands. In this indirect value method, the question was asked as to what it would cost to build a waste water treatment works, to cleanse this amount of water filtering through each of the three wetlands of the study.

The decision was made to focus on the Vyeboom Wetland on the Western side of the Dam, as one hectare of the toe of the wetland, which is next to the dam, has already been damaged by erosion placing 25 hectares of wetland at risk. Also, the complex economic model of this study, projecting over the next fifty years, shows that if restoration does not occur in the Vyeboom Wetland, the loss of value of benefits, will be R 2.5 million in net present value.

The importance of ensuring water flows into the Theewaterskloof Dam is driving invasive alien

plant clearing on a large scale in the mountainous catchment of this dam. It is important that alien plants are eliminated from these wetlands and that where alien plants are at a low level, such as in the Du Toits Wetland to the north of the dam, that these plants are maintained at this level.

Similarly, it is recommended that this study will act as a driver to an organisation such as Working for Wetlands to understand the future value of the Vyeboom Wetland, such that the necessary restoration is put in place to prevent further damage. The intrinsic value in terms of biodiversity conservation of these three wetlands of the Theewaterskloof Dam have been qualitatively assessed in parallel in this study, as this is not easily assessed using economic valuation. It is considered that this Economic Valuation of Selected Wetlands of the Theewaterskloof Dam is a unique study, where the loss of value over time of wetlands has not been assessed before. This gives the opportunity for application of this value modelling to other wetlands, to guide decision making and restoration expenditure.

Wilna Kloppers, Director: Pollution and Chemicals Management emphasised the importance of the study," this project focused on the assessment of the value in terms of ecological services provided by the three wetlands in the catchment of the Theewaterskloof Dam, which is the biggest dam in the Western Cape Water Supply System (WCWSS). 80% of the water that flows into the Theewaterskloof Dam flows through these three wetlands and therefore they play a major role in improving the water quality and regulating the flow into the dam. The study illustrated that investing in the **protection** and **rehabilitation** of these wetlands makes sense, from both an economic and water security perspective".

