

An investigation on the potential for fog water harvesting from Table Mountain, South Africa

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The fog cloud that frequently appear over Table Mountain in South Africa could serve as a supplementary source for Cape Town that is located in the dry semi-arid Western Cape Province. Fog clouds over the mountain is mostly associated with moisture advection from the south-easterly ocean, driven by south-easterly winds, during the austral summer and winter seasons. However, during the winter season, northwesterly winds that originate from rain bearing cold frontal systems contribute to a significant portion of table fog events, and in addition, also brings precipitation to the mountain. In this study, the potential of harvesting fog water as a supplementary water source from the fog cloud on Table Mountain is investigated. This investigation formed part of a range of strategic studies by the City of Cape Town aimed at determining the potential of adding water from alternative sources to the water budget of the city. The study firstly consisted of a comprehensive analysis of all historical and currently collected meteorological data on Table Mountain, as well as in the vicinity of the mountain. Subsequently, the characteristics of fog clouds over Table Mountain were investigated, with a detailed analysis of how fog cloud density is affected by mountain terrain features – within the limitations of the data available. The mountain terrain was also used as an indicator of the most suitable places on Table Mountain for erecting both pilot and longer term fog water harvesting systems. Included was an Environmental Impact Assessment (EIA). Specific regions on Table Mountain were found to be most suitable for fog water harvesting, taking into consideration terrain, tourism, accessibility and its influence on the environment, keeping in mind that Table Mountain is a World Heritage Area. In conclusion, estimated water yields from fog cloud harvesting were provided.