

Takunda Mambo. An examination of changes in rainfall, streamflow and landcover: a case study of the Kandelaars catchment, Oudtshoorn, South Africa 1926 to 2008. (Mphil in Disaster Risk Studies, 2012).

This study seeks to understand changes in rainfall and land-cover in the Kandelaars catchment, which are documented drivers that influence the magnitude, seasonality, and trends in flash-flood occurrence. The study site is situated South-West of the town of Oudtshoorn, which is part of a semi-arid basin, found between the Swartberg, Rooiberg, Outeniqua and Kammanassie mountains. This area is documented for its extensive agricultural activity in the form of ostrich farming, which has been practised there for over a century. In addition, the area is also exposed to seasonally extreme meteorological conditions, most notably in the form of cut-off lows, which have been projected to intensify with the changing climate. Despite the rich culture of ostrich farming, which has played a pivotal role in the development of the town, the intensity and consistency of the practice has come to be an environmental burden to the land, which is also exposed to intense rainfall. These have resulted in the reporting of major economic losses in the recent past, due to floods. This was the case on 29 June 2011, when three zones around the municipality were subjected to flooding, which resulted in losses amounting to R120 million. In this instance, part of the Kandelaars catchment, located in zone three, was subjected to almost R40 million in flood-related losses.

Owing to the locality of the Kandelaars catchment, and its documented practice of ostrich farming, the study sought to investigate changes in rainfall and vegetation cover, which are documented drivers that influence the magnitude, seasonality, and trends in flash-flood occurrence. The study revealed that rainfall has a very strong relationship with river discharge levels. Rainfall records revealed a shift in seasonality to later in the year, and an increase in the frequency and intensity of events in recent years. Similarly, this trend was observed in the results of the river-flow records. The study also indicated that there has been a significant amount of agricultural expansion, particularly in the upper catchment and along the riparian zones. Ostrich farming has led to extensive vegetation removal, in many instances leaving surfaces bare, with rocks and stones exposed. This was largely the case where birds were restricted to confined spaces. In addition, other forms of livestock rearing, specifically sheep and cattle, have also led to land-cover alteration and vegetation removal.