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Small farm dam capacity estimations from simple geometric relationships in support of the water use verification process in the Inkomati Water Management Area

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Abstract Within the Inkomati Water Management Area in South Africa, there are a large number of small farm dams. While they are of economic value, the management of these dams raises key questions for water managers. As a result, a study to verify the storage of all farm dams has been initiated, as part of the development of an integrated river-basin-scale modelling system. The initial step towards this goal is the development of a tool to estimate the capacity of small farm dams from simple geometric relationships. The methodology used is the Geographical Information System (GIS)-based approach, with dam geometries such as the surface area, fetch and width being estimated. The results show that there is a large variation in farm dam geometries resulting in a wide range of possible storage capacities for any given surface area and that farm dam geometries tend to vary between sub-catchments.

Key words small dam capacities; Geographical Information System; Inkomati Water Management Area, South Africa