



## ASSESSING PUBLIC SPACES POLLUTION RISK IN UNPLANNED PERI-URBAN AREAS THROUGH HIGH-RESOLUTION DRONE AERIAL PHOTOS – A CASE STUDY OF MAXAQUENE NEIGHBORHOOD, MAPUTO.

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### ABSTRACT

Public spaces such as schools and unused land are preferred play grounds by children. However, in low income urban neighborhoods these are often areas exposed to higher pollution risk from waste dumps but also from contaminants transported during storms through superficial runoff. In this study we used high-resolution aerial photos taken from a drone and tested their application to assess runoff generation and to infer the contaminant or trash dispersion during the rainfall in Maxaquene, a suburban neighborhood of Maputo City, Mozambique. The photos were taken in four flight plans, at an altitude of 117 m a.g.l., covering an area of 4.16 Km<sup>2</sup>. The 3465 aerial photos were taken with a spatial resolution of 2.91 cm/pixel. On the ground, 43 control points were marked with differential GPS. From the aerial photos we reconstructed a digital elevation model and a digital terrain model using AGISOFT PHOTOSCAN PRO, combining the aerial photos with the ground control points collected by means of dGPS. We created a dense point cloud with high resolution, followed by a pixel classification aiming to distinguish the ground surface from the objects located above the surface. From the elevation data, we extracted the flow directions and flow accumulation, that may represent the runoff dispersion during the rainfall events. High flow accumulation coincide with the main roads, and low flow accumulation are independent of the infrastructures of the study area. The results show for any given point, the sub basin from where runoff may leach and transport any material, and bring to such point. The results are used to determine runoff generation areas linked to open public spaces and to evaluate potential pollution risks of these areas. We show how one of the schools in this neighborhood is highly exposed to contamination by waste transported during storms and measures should be taken to prevent health risks to children using these areas during rain periods.