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Assessing the hydrological and hydraulic behaviour of an arid catchment which determines flood impacts in the Dhofar governorate, Oman

Manal A. Al Balushi^{1*}, Joseph Holden¹, Mark A. Trigg²

¹*School of Geography, University of Leeds, Leeds, LS2 9JT, UK, *email: gymaha@leeds.ac.uk*

²*School of Civil Engineering, University of Leeds, Leeds, UK*

ABSTRACT

Oman has experienced several major recent flood events, most of them considered as deadly flash floods. The Dhofar governorate has been at the brunt of such floods, most recently in 2018 and 2020. This study seeks to identify appropriate flood risk mitigation measures by understanding the hydrological processes operating in the Darbat catchment in the region. We utilize hydrological and hydraulic models to simulate previous floods events in 2002, 2018 and 2020. The predictions from the coupled hydrological and hydraulic models provide good results as validated by multiple evidence sources including remote sensing, local community surveys and data from regional agencies. Scenario modelling can now be used to indicate key areas of the landscape that could be modified to reduce flood risk downstream under different intensities of rainfall – these scenarios could include grazing management, large flood dams, and the potential use of more cost-effective small temporary wadi dams.

Keywords: Flood modelling; Ephemeral streams; Arid; Dhofar; Flash floods

*Corresponding author