Damage and Loss Assessment Due to Tropical Cyclone Idai's Flooding Events in Chimanimani District, Zimbabwe

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SUMMARY

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Abstract

The devastating events which befell Chimanimani as a result of Cyclone Idai in March 2019, came with extensive flash flooding, landslides and very high-speed winds which caused huge destruction in the district. The main objective of the study is therefore to assess the damage and loss that came as a result of the cyclone, particularly looking into the flood extent and how such extreme events affected the vegetation and built-up areas. This research used Sentinel-1 (Radar) and Sentinel-2 (Optical) imagery. Sentinel-1 SAR GRD data was used to map the flood extent using the pre- and post-flood events images. In order to measure the response of built-up and vegetation to flood events in the Chimanimani district, sentinel-2 data was used through different indices such as NDVI, NDBI and NDWI which were used in mapping vegetation change and validating flood extents. The results showed that there was a greater negative effect to vegetation than the positive change due to flooding which occurred mostly along rivers and streams. For the built-up areas affected by floods, the results illustrate that the greater percentage was in the negative change as

compared to non-affected built -up areas. Thus indeed floods have a negative effect as explained by the houses, bridges and roads that were swept away by water. Cyclone Idai was accompanied by strong winds and flash flooding which both had an effect on the damage and loss that occurred. Therefore, in conclusion, consequential damage and loss came as a results of flash flooding in both vegetation and built-up areas in the Chimanimani district, Zimbabwe. The Government, Aid agencies etc may employ this approach in define the extent of the damage and estimate the amount of resources required to address the effects of cyclone damages.