



Drought vulnerability assessment for prioritising drought warning implementation

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Drought warning provides a potentially efficient approach to mitigation of drought impacts, and should be targeted at areas most vulnerable to being adversely impacted. Assessing drought vulnerability is, however, complex and needs to consider susceptibility to drought impact as well as the capacity to cope with drought. In this paper a Drought Vulnerability Index (DVI) is proposed that considers four primary components that reflect the capacity of society to adapt to drought; the renewable natural capital, the economic capacity, the human and civic resources, and the available infrastructure and technology. The DVI is established as a weighted combination of these four components, each a composite of selected indicators. Constituent indicators are calculated based on national and/or regional census data and statistics, and while the resulting DVI should not be considered an absolute measure of drought vulnerability it does provide for a prioritisation of areas that can be used to target drought warning efforts. Sensitivity analysis of weights applied show the established DVI to be robust. Through the DVI the development of drought forecasting and warning can be targeted at the most vulnerable areas.

The proposed DVI is applied at both the continental scale in Africa to assess drought vulnerability of the different nations across Africa, and at the national level in Kenya, allowing for prioritisation of the counties within Kenya to drought vulnerability. Results show the relative vulnerability of countries and counties vulnerable to drought. At the continental scale, Somalia, Burundi, Niger, Ethiopia, Mali and Chad are found to be the countries most vulnerable to drought. At the national level, the relative vulnerability of the counties across Kenya is found, with counties in the North-East of Kenya having the highest values of DVI.

At the country level results were compared with drought disaster information from the EM-DAT disaster database, showing a good agreement between recorded drought impact and the established DVI classes. Kenya counties most vulnerable to drought are primarily located in the North-East of the country, showing a reasonable agreement with the spatial distribution of impacts of the 2010/2011 drought, despite the drought itself being more widespread.