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Who adapts and how? Household-level inequalities in coping and adaptation within WEF-nexus in drought-prone Namibia

Faith Kudzai Chihumbiri[1], Thinah Moyo[1], Dominic Mazvimavi[2], Tina Beuchelt[3]

[1] *Namibia University of Science & Technology, Natural Resource Science, South Africa*
[2] *University of the Western Cape, Dept. of Earth Sciences, South Africa*
[3] *University of Bonn, Center for Development Research (ZEF), Ecology and Natural Resources Management, Germany*

Abstract

Households of smallholder farmers in semi-arid and arid regions across sub-Saharan Africa experience and cope with climate stress differently. Differences in access to resources impact responsive strategies implemented. Recurring droughts and climate variability experienced in Namibia influence smallholder households' daily access to water, energy and food. How they respond varies across households and communities. Although there is growing attention to climate-responsive development, there is limited empirical evidence demonstrating how access to different forms of resources such as water, energy and food shape households' responses to effects of long dry spells, especially droughts. This comparative study investigates variations in coping and adaptation among smallholder households in Hardap (arid) and Oshikoto (semi-arid) regions of Namibia. Through a combination of the Sustainable Livelihoods Framework with WEF-nexus lenses, the study draws on mixed-methods. Household survey data were collected from 216 households across rural and peri-urban communities. Indicators of water, energy and food access were used to construct a Water Access Index, Energy Access Composite Index and the Household Dietary Diversity Score as proxies for food access. These data were analysed alongside livelihood capital indicators. Findings show that socio-economics influence household adaptation capacity. In Hardap urban, households face compounded access challenges despite proximity to infrastructure and formal support systems. Contrary, rural households demonstrated flexibility, implementing diversified livelihood strategies that were not dependent on rainfall but on stronger social networks. Further, the study showed that each household's access to WEF resources shaped types and effectiveness of coping responses. Access to these resources influenced the way households made decisions regarding livestock management, crop choices and when to depend on external support such as the government and church-led drought relief programmes. Households with stronger financial and social capital had the ability to anticipate and adjust to climate stress. Households with fewer resources seemed to rely on short-term coping strategies which weakened longer-term resilience. In highlighting different ways households access WEF to survive under drought conditions, the study points to the importance of targeted, community-specific interventions that consider household-level dynamics. This strengthens the need for evidence-based decision-making in designing households and community support for climate-adaptated agro-ecosystems in developing countries.

Contact Address: Faith Kudzai Chihumbiri, Namibia University of Science & Technology, Natural Resource Science, 52 Reid Street East, Avondale, Parow, , 7500 Cape Town, South Africa, e-mail: fchihumbiri@gmail.com

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