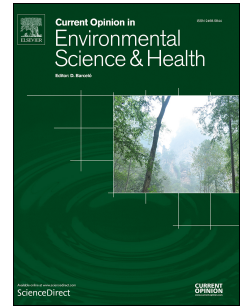


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Ecosystem-Based Solutions for Flood-Drought Risk Mitigation in Vulnerable Urbanizing Parts of East-Africa

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Abstract

Urbanization and climate changes have direct impacts on ecosystems and the services they provide to society, thus influencing human well-being and health. Urban sprawl may conflict with ecosystem services, e.g. enhancing water-related stresses and risks of, e.g., droughts and floods, with significant economic, environmental and societal impacts. Such hydro-climatic extremes and their societal impacts are evident around the world. East Africa is a region with highly vulnerable populations to frequent floods and droughts. To achieve long-term sustainable solutions to such water-related risks and problems, we need to understand and plan for the feedback mechanisms between population expansion and associated land-use changes and their impacts on ecosystem services. The potential of ecosystem-based solutions to mitigate these risk and problems in urban development under climate change needs to be considered and accounted for in spatial planning and management strategies.

Keywords: nature-based solution, natural hazards; sustainable solutions; climate change; land use change; hydro-climatic extremes

Introduction

Ecosystem services and goods (ES) represent the direct and indirect benefits humanity derives from ecosystems [1]. The ES concept is considered a useful approach to highlight the dependence of human well-being on ecosystems, bridging the gaps between ecology, economics and society in order to achieve sustainable resource management [2]. A particular strength of this concept is its ability to spatially integrate multiple biophysical conditions, thereby facilitating collaboration between science and policy in finding solutions for global challenges, recognition of human-nature interactions, and more informed exploration of feedback loops [3, 4]. This is not least useful for our ability to handle water-related disasters, such as floods and droughts, as these are governed by the feedbacks that potentially also hold a key to efficient flood-drought risk reduction.

Water-related disasters are largely created by people living in conflict with their environment [5]. As such, changes in environmental conditions can have enormous consequences on *people* and *places* experiencing such changes [6]. Climate change effects may further accelerate and exacerbate such environmental impacts on society [7]. For water-based disasters in particular, climate change implies altered average temperatures and precipitation patterns that may lead to more intense and frequent floods and droughts [6]. It is essential to develop more effective strategies, methods and tools for incorporating water-based analysis into spatial planning aiming

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