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POLICY BRIEF

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Towards implementing urban Nature-based Solutions in Mauritius

KEY MESSAGES

- **Pluvial flooding, flash floods and heat stress are central climate impacts** in urban areas in Mauritius according to the scientific literature. Particularly pluvial flooding and flash floods are a major concern in Port Louis given its geographic location where rainwater runoff from the surrounding mountain ranges has caused extreme flood events in the city center (e.g., during tropical cyclone Belal, January 2024). In addition to this, the average mean surface air temperature is projected to continue an increasing trend.
- **Urban Nature-based Solutions (NbS) like permeable pavements, infiltration measures, rainwater harvesting and, creation of bio-retention systems** are potential remedies for these challenges because they can reduce flood impacts and simultaneously offer environmental and social co-benefits in comparison to conventional grey or engineered solutions. However, there are currently hardly any examples of urban NbS that address these challenges.
- **The next necessary step to move towards implementing NbS is to build on existing experiences and strengthen enabling environments that incentivize the use of NbS,** for example, by presenting proof of concepts and clear NbS investment cases to attract the much-needed resources for implementing NbS. For this, the National Climate Change Adaptation Policy Framework 2021 can serve as a central leverage point for policymakers and investors.

NBS BENEFITS

78%

Permeable pavements have significant average water retention capacity and potential to decrease water runoff[1].

58%

Bio-retention systems offer substantial average water retention capacity and can decrease water runoff volumes and peak flow rates during storm events[1].

DEFINITION

Nature-based Solutions are *"actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits."*[2]

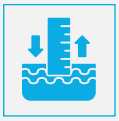
CONTEXT & RATIONALE

The challenges of climate change and rapid urbanization present central obstacles to sustainable development in cities of low- and middle-income countries (LMIC). Urban Nature-based Solutions (NbS) receive growing attention as potential remedies for these challenges because they offer environmental and social co-benefits in comparison to conventional grey or engineered solutions. In practice, NbS co-exist and positively complement conventional grey or engineered solutions.

In the context of the "Implementation of Urban Nature-based Solutions for Mitigation and Adaptation" project, the UNEP Copenhagen Climate Centre (UNEP-CCC) prepared a technical report based on a literature review of the scientific and grey literatures to understand central climate impacts and risks in Mauritius and to gauge how urban NbS could address them (find the full technical report here).

[1] Urban stormwater retention capacity of nature-based solutions at different climatic conditions - ScienceDirect

[2] Nature-based solutions for supporting sustainable development



Pluvial flooding, flash floods and heat stress

The literature review shows that pluvial flooding, flash floods and the respective run-off from elevated areas around the city as well as heat stress are key concerns for Port Louis.

However, we find hardly any implementation of urban NbS that address these challenges. This is problematic because the city is regularly affected by flash floods, e.g., the regions La Poudrière, La Chaussée, Place d'armes streets and the surroundings frequently experience rapid water set-up and flooding. Additionally, increasing temperatures cause significant heat stress to the residents and daily commuters in Port Louis.

Bioretention systems, permeable pavements, and rainwater harvesting

There is great potential for exploring NbS like permeable pavements, natural infiltration measures, rainwater harvesting and, creation of bioretention systems in Port Louis to address the flood and heat challenges.

These could be coupled with greening of roads and parking spaces, reforestation of peripheral mountain slopes and green roofs which could contribute to lowering air temperatures and relieving the overwhelmed flood management infrastructures, potentially even creating green jobs[3]. Bio-retention areas generally demonstrate cost-beneficial outcomes, when considering benefits from the reduction of flood risks, regulation of water flows, and water treatment that often result in a positive net-present value when calculated against the investment, operation and maintenance costs[4]. Hence, it is recommendable to further explore the potential of these NbS in Port Louis and other urban and peri-urban areas in Mauritius. This includes careful consideration of potential barriers that could hamper the implementation of NbS such as limited social acceptance of these measures and also being cognisant of the limits of NbS to reduce climate risks, particularly under high-end climate change scenarios.

Towards implementing urban NbS in Mauritius

The next necessary step to move towards implementing NbS is to create enabling environments that incentivize the use of NbS, for example, by presenting proof of concepts and clear investment cases to attract the much-needed resources for implementing NbS[5].

Policymakers can use the National Climate Change Adaptation Policy Framework 2021 as central leverage point. Building capacity in the area of NbS will also help to meet international reporting requirements on climate change impacts and adaptation as set out in the Paris agreement.

[3] Decent Work in Nature-based Solutions 2024 | UNEP - UN Environment Programme

[4] Cost-Benefit analysis of urban nature-based solutions: A systematic review of approaches and scales with a focus on benefit valuation - ScienceDirect

[5] Business Models for Financing Nature-Based Solutions in Urban Climate Action – UNEP-CCC

UNEP COPENHAGEN CLIMATE CENTRE (UNEP-CCC)

UNEP-CCC assists developing countries in a transition towards more low carbon development paths and supports integration of climate-resilience in national development. This policy brief was developed in the context of the project "Implementation of Urban Nature-based Solutions for Mitigation and Adaptation" funded by the Ministry of Foreign Affairs of Denmark.

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