PhD fellowship 1- Addressing water-related risks in rapidly urbanising catchments

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Nature-based solutions (NbS) are green infrastructure that mimic natural processes to address risk related to climate change, water security, and public health. Several studies and focused research has reported various benefits of NbS across levels: local, national and global. However, despite all benefits, a recent study by IUCN reported that out of the total funds for infrastructure development, less than 1% is spent towards supporting green infrastructure, including NbS. Lack of evidence on the effectiveness of NbS as compared to grey infrastructure, timescales for effective operations, cost-effectiveness at scale, lack of policies for implementation and lack of standards to assess the benefits are some of the main barriers/constraints towards scaling up of NbS.

Bangalore –one of the largest cities in India is facing significant water quantity and quality issues for the last two decades. The lack of wastewater treatment infrastructure allows the discharge of large quantities of wastewater into open stormwater drains and lakes. Studies report that in addition to providing cost effective treatment NbS also helps in overcoming the 'yuck' factor associated with the use of treated effluents for non-potable purposes. Here we propose a holistic solution to promote circular water economy by deploying NbS to treat greywater from specific sources like food canteens housed in large institutions. Government-funded and private research institutions contribute significantly to the wastewater generation in the city. Besides, large quantities of freshwater is used for landscaping and non-potable purposes. Presently, around 100 government and private institutions within the Bangalore urban area have varying wastewater treatment and disposal practices. The wastewater from these institutions is directly discharged into the sewerage system managed by BWSSB. According to an estimate, the food canteens in these institutions consume 20% of the total water supply. The quality of greywater from such spaces has low contaminant levels that can be managed by deploying simple, low cost interventions. To design effective NbS interventions, in addition to optimising treatment processes there is a critical need to understand the drivers and perceptions behind these institution-level wastewater practices.