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Rising Demand and Dwindling Water Supply

Urban Himalaya running dry



About HI-AWARE

HI-AWARE aims to enhance the adaptive capacities and climate resilience of the poor and vulnerable women, men, and children living in the mountains and flood plains of the Indus, Ganges, and Brahmaputra river basins. It seeks to do this through the development of robust evidence to inform people-centred and gender-inclusive climate change adaptation policies and practices for improving livelihoods.

The HI-AWARE consortium is led by the International Centre for Integrated Mountain Development (ICIMOD). The other consortium members are the Bangladesh Centre for Advanced Studies (BCAS), The Energy and Resources Institute (TERI), the Climate Change, Alternative Energy, and Water Resources Institute of the Pakistan Agricultural Research Council (CAEWRI-PARC) and Wageningen Environmental Research (Alterra). For more details see www.hi-aware.org.

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Key Message

The water demand-supply gap in 8 surveyed towns across the HKH region is 20-70%. There is a high dependence on springs (ranging between 50-100%) for water supply in three-fourths of the urban areas of the Himalaya. The gap between demand and supply may double by 2050 in a business as usual scenario. A holistic approach to manage water that includes springshed management along with planned adaptation is of the utmost importance for securing safe water supply in the urban Himalaya. Along with springshed management, other options could be explored in the wake of rising water demand and use.



Introduction

“The world’s population living in urban areas is expected to increase from 54% at present to 66%, therefore, urban areas need to be ready to serve another 2.5 billion people.”

The Hindu Kush Himalayan (HKH) region is characterized by a unique mountain topography, climate, hydrology and geology. It is of the most fragile mountain ranges in the world, due to its biophysical conditions, that include presence of steep slopes with natural geomorphic processes at play. Each of these factors plays an important role in determining the availability of water for people living in the HKH region. The land available for developing physical infrastructure for towns in the HKH is extremely limited compared to the plains. Nevertheless, there has been an increase in urbanization in the HKH that can be largely attributed to regional imbalances in providing economic opportunities for the poor. Migration from rural areas to the nearest urban centres in search of employment and other economic opportunities is a consequence of lopsided development, leading to an increase in the urban population and decline in the rural population.

The world’s population living in urban areas is projected to increase from 54% at present to 66% by 2050; therefore, urban areas need to be ready to serve another 2.5 billion people by 2050. It is noteworthy that 90% of the projected increase in urban population is concentrated in Asia and Africa. As a result, there will be urbanization pressures on the HKH region too. Like the rest of the world, the HKH region is witnessing rapid urbanisation with current population of 240 million in the mountains and hills in 2017. Multiple biophysical and socio-economic drivers are leading to large scale migration from rural to urban areas (Figure 1).

Unlike other ecosystems of the world, mountains are still less explored and researched. It would be unwise to ignore the mountain ecosystems from which half the global population benefits. This brief summarises the issues in eight urban centres of four river basins in HKH region which focus on present state of knowledge about water scarcity in these urban centres. Further, it maps future challenges that these towns would face in a ‘business as usual’ scenario. These cases are drawn from primary research and address an important knowledge gap about the status of water resources and water supplies in the urban areas of the Himalaya.



Figure 1: Urban centres in the HKH region and surveyed towns, 2017

Method

The research involved collecting quantitative data through survey of 1400 households in eight towns – Mussoorie, Devprayag, Kalimpong and Singtam (India), Damauli and Tansen (Nepal) and Murree and Havelian (Pakistan) (Figure 2). The survey was conducted using a structured questionnaire as well as qualitative methods such as like focus group discussions (FGDs) with different stakeholders and participant observations. The number of households surveyed in each city was arrived at by taking proportions of the actual population of the city while the sample size within wards of each city was determined based on the proportion of the actual ward-wise population.

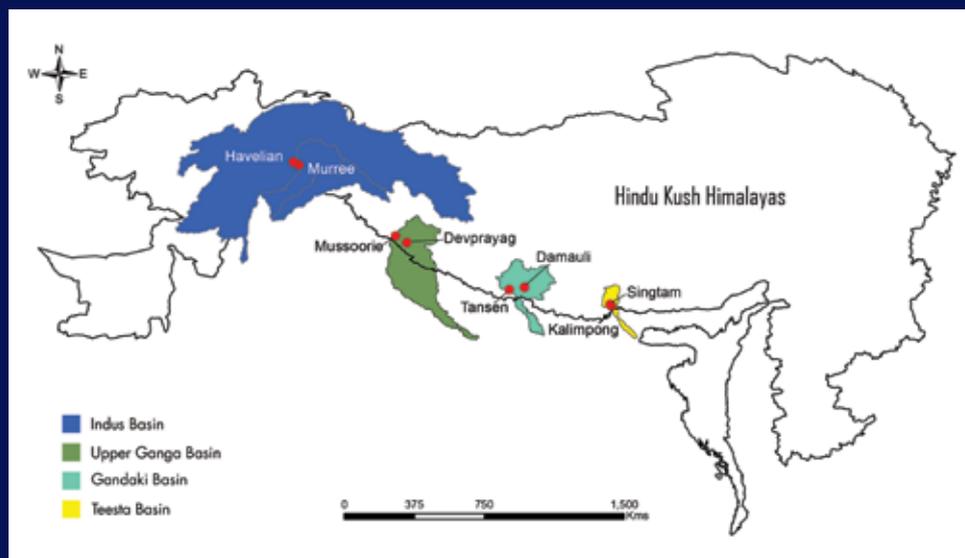


Figure 2: Location map of research sites

Key Findings

Rising demand outpacing dwindling supplies

The present per capita water availability in urban areas of the Himalaya is already below the WHO prescribed standard of minimum 100 lpcd. The water demand-supply gap in 2017 in the 8 surveyed towns is found to be 20-70%. This gap is expected to double by 2050 in a business as usual scenario. The ballooning demand for water for the growing population is likely to be met with a stagnant or even depleting water supply situation given the absence of future oriented planning and development. The inability of urban authorities to reach out to the growing population has already led to the existing gaps in water availability being filled by the informal water markets, giving rise to a new issues pertaining to access and equity.

Unsustainable exploitation of springs

Historically springs have been the predominant source of freshwater supply across urban centres in the Himalayas. This high dependence can be attributed to local hydrology, topography and culture. These springs provided substantial water security to dependent populations and ecosystems in the past, but the scenario is now rapidly changing owing to overexploitation driven by socio-economic stressors. As a result, an increasing number of springs outside urban boundaries are now exposed to unsustainable levels of exploitation. Springshed management is critical to maintain the health of these systems and the ecosystem services they provide. Unfortunately such initiatives are hampered by the absence of data, effective resource monitoring, and regulations related to springs.

A photograph of a busy street in a mountain town. A yellow bus is in the foreground with a man sitting on its roof. In the background, there are multi-story brick buildings, a large 'TUBORG' beer sign, and a smaller sign for 'STUDY IN AUSTRALIA'. People are walking on the street, and a crowd of women carrying water jugs is visible on the left. The scene is set in a hilly, urban environment.

Crisis of urban water governance

There is a need to include water management as an overarching consideration for urban planning and development. This is an urgent issue to be addressed because water underpins sustainability and growth across all sectors of urban economy. This approach will contribute towards informed adaptations to secure water supply in urban areas of the Himalaya. Presently urban water governance in the Himalaya is facing a number of challenges including the absence of resource centric policies and plans, overlapping institutional mechanisms and limited capacities. This situation also contributes towards issues for access and equity due to lack of transparency in the system.

Recommendations

The current focus of urban water management system in mountain towns is to augment water supply. However, there is an urgent need to reform the urban water sector by developing a framework which includes soft, hard, structural and non-structural measures and can be implemented for both demand and supply side management.

More planned adaptations are necessary for securing safe water supply in urban areas of the Himalaya, including springshed management. An increasing number of springs outside urban boundaries are exposed to unsustainable levels of exploitation to cater for rising water demand. Spring sources are overexploited in the absence of effective resource monitoring and regulation. Special initiatives to protect springs could pave the way for conservation and sustainable water management. However, other options for augmenting water supply could also be explored.

Local governance institutions in urban Himalayas are often unequipped to manage town specific water issues. There is also a lack of integration between urban planning and natural resource management. This often puts existing water sources in a vulnerable state. Thus, urgent actions are also required for improving institutional mechanisms and water governance in and around these urban centres.

This brief is based on the following HI-AVWARE publications:

Singh, S., Hassan, S.M.T., Hassan, M., Bharti, N. & Mukherji, A (forthcoming). Urbanization and water insecurity in the Hindu Kush Himalayas: Insights from Bangladesh, India, Nepal, and Pakistan. Submitted to a special issue in *Water Policy* on Water in Himalayan towns: Lessons for adaptive water governance

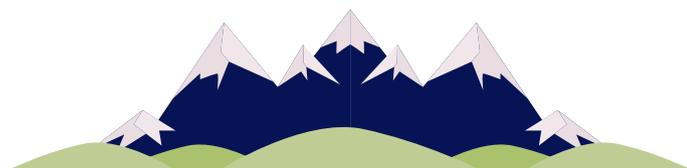
Prakash, A., Wester, P., Kovacs, E.K., Singh, Vishal and Molden, D., (forthcoming). Water management in Himalayan towns: What do we know and what did we learn?. Submitted to a special issue in *Water Policy* on Water in Himalayan towns: Lessons for adaptive water governance

Virk, Z.T., Ahmad, B., Khalid, B., Saeed, S., Raza, N., & Kamran, A., (forthcoming). The demand – supply paradox: A case of two Himalayan towns in Pakistan. Submitted to a special issue in *Water Policy* on Water in Himalayan towns: Lessons for adaptive water governance

Bharti, N., Khandekar, N., Sengupta, P., & Bhadwal, S., (forthcoming). The falling water towers: Water supply, demand and use under rising urbanization in western Himalayas. Submitted to a special issue in *Water Policy* on Water in Himalayan towns: Lessons for adaptive water governance

Shrestha, K., Singh, S., Hamal, M. & Prakash, A., (forthcoming). Perform or wither? Role of water users' groups in two municipalities of Nepal. Submitted to a special issue in *Water Policy* on Water in Himalayan towns: Lessons for adaptive water governance

Sharma, G, Namchu, C.V., Nyima, K., Luitel, M, Singh, S., & Goodrich, C.G., (forthcoming) Local Political structure and the future of water management: A case of two towns in Eastern Himalayas. Submitted to a special issue in *Water Policy* on Water in Himalayan towns: Lessons for adaptive water governance.



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