

WATER SECURITY IN TIMES OF DISASTER RISKS

STRENGTHENING COMMUNITY-LED INITIATIVES IN URBAN SETTINGS



Figure 1: The landslide triggered by an earthquake swept away the water intake pipes (Photo: Toby Smith/panipahar.com)

KEY MESSAGES

- I. Municipalities need urgent technical support in water security planning
- II. Large water supply systems are important but are also susceptible to risks like landslides
- III. To enhance water security, multiple strategies of water supply led by community groups, households, private groups, and government are necessary
- IV. City-level multi-stakeholder water forums are necessary, supported by action research

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Figure 2: Water source used by women soon after the 2015 earthquake (Photo: Toby Smith/panipahar.com)

1. BIDUR OFFERS A POWERFUL RESILIENCE STORY

Bidur is a small town located near the confluence of the Trishuli and Tadi Rivers in the central Nepal Himalayas, nearly 40 km northwest of the capital city of Kathmandu.

It was one of the towns hardest hit by the 2015 Gorkha Earthquake, which devastated the Bidur Drinking Water and Sanitation project. The main water supply of the town has been managed by Bidur Drinking Water and Sanitation Users Committee (BDWSUC) with support from Bidur Municipality since 1995.

For several weeks after the failure of this major project, people relied on water supplied by small water user committees. The town has 31 such small schemes managed by community groups.

A survey carried out by the Southasia Institute of Advanced Studies (SIAS) in 2016 found that more than 55 percent of households suffered pipe damage to their Bidur water supply source from the 2015 earthquake. However, more than 80 percent did not suffer severely, as they had access to alternative water sources supplied by these smaller community-led projects. At the time of the COVID-19 pandemic in early 2020, Bidur residents once again had to rely on smaller community-managed water supply systems. This was because machines used by larger projects had technical problems and could not be repaired for operation due to a lack of

technicians available in the town. The COVID-19 induced government lockdown barred travel for technicians along with others.

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Spread around the towns, the local water sources are too small to meet demands beyond the four months of the rainy season (Dahal, N., 2014). Along with this, these community water user groups experience internal conflicts and issues of water quality, quantity, and delivery efficiency (Ojha et al., 2020). In this context, should we focus on renovating and strengthening the large water supply system? Or, should we also

support dozens of smaller schemes that provide critical water safety net in times of crisis? In this policy brief, we suggest that a mixed approach of large and small water supply schemes is the most resilient solution for the water security of Himalayan towns that are exposed to a high risk of disasters.

2. THE BIG POLICY QUESTION

Influenced by modernisation trends in the global water sector, Nepal is moving towards large-scale and centralised water management systems to address burgeoning urban water needs. This may be termed a policy departure from decades-old practices of supporting community initiatives. A large-scale Asian Development Bank (ADB)-supported drinking water

supply project is currently being developed in Bidur by the Government of Nepal¹. With an investment of seven million US dollars, the project aims to tap 89 litres of water per second from the source in order to meet the needs of 58,659 people living in 10,114 households till 2035².

ADB has provided 70% of the costs, 25% was raised as a loan from the Government's Town Development Fund, and the remaining 5% is to be contributed by the local water users. As the region was among those most affected by the 2015 earthquake, the Nepalese Government paid the 5% contribution on behalf of the community. The ADB contribution is a mix of loans and grants offered on the condition that Bidur residents pay back their share of the project cost when the project begins operation. Bidur residents have been waiting for this project to be completed and operational, as construction work continues. The leadership of Bidur municipality has repeatedly said that the water crisis in Bidur will be resolved after the project is completed.

While the large-scale scheme of integrated water supply system is in progress, small water schemes have played a pivotal role in meeting daily needs. The role of the smaller community-led schemes was never so instrumental as immediately after the 2015 earthquake. These local sources were then the only option for marginalised households, such as those from informal settlements and poor people who either have no access to the municipal water supply system or could not afford to pay.

In addition, the earthquake revealed glaring gaps in the large-scale municipal water scheme currently under construction. This Bidur water supply project has been adversely affected by landslides and flooding, as the pipe systems and supporting infrastructures were either swept away, dislocated, or damaged due to these frequent disasters. The damaged system could not immediately resume operations due to its technical and financial limitations. For an essential commodity like water, it was not possible to keep households waiting for their supply while the infrastructure was repaired. Despite being a matter of hope, delight

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and anticipation, the large scheme turned out to be both a technical burden and a managerial complexity.

This gave rise to an important policy question: was the large ADB and government-funded water supply scheme to replace the sourcing of local supply streams by community-led groups entirely, or only in part? What were the advantages and disadvantages,

of the maintenance and support requirements of community-led schemes? Who would be the stakeholders who could analyse these issues and propose possible solutions?

3. ARE THE SMALL SCHEMES SUSTAINABLE?

Recent disaster incidents have underlined how the 31 community-led small-scale schemes are crucial to meeting the water needs of Bidur residents, particularly to the populations from poor and marginalised groups (Figure 3 shows the supply area of the community water users committees). Further, the SIAS survey found that people have a strong preference for spring water over the river-sourced ADB-supported water

supply project arising from taste and cultural preferences. In SIAS' 2016 survey conducted among users of one community-led scheme called *Rawal Dhara* located in the middle of the town, 92 people were observed visiting the spring through a 90-minute observation period. Among them, 32 people were surveyed in depth. Among those interviewed, 82% stated that

they visited this spring due to the better taste of the water. What is more, 70% of the households who visited this tap also had individual pipe connections, yet they preferred the *Rawal Dhara* for their drinking water.

“ The earthquake revealed glaring gaps in the large-scale municipal water scheme currently under construction. ”

“I have to walk 10 minutes to come to this tap but I am happy to invest my time and effort because the water we get from Rawal Dhara is of very good taste and quality. This water, we can drink directly without boiling it. We feel lucky as we have this water source in our community.” (Interview with Women in Rawal Dhara, public tap, Interview note, 2019, SIAS)

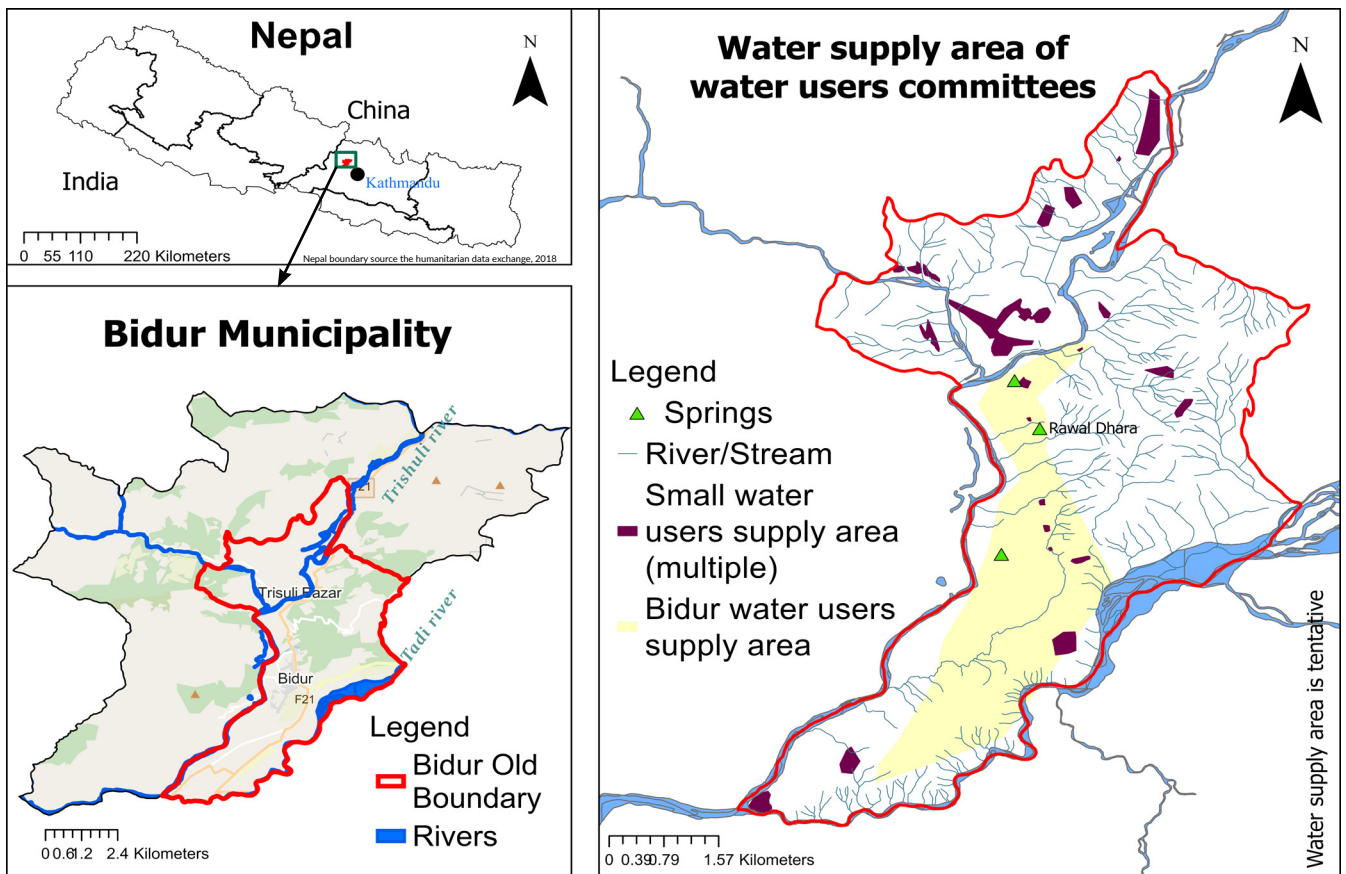


Figure 3: Location map of Bidur and service area of multiple small schemes

Small projects and sources such as these springs have proved to be a lifeline to people during times of ‘disaster’ in Bidur. While 40% of households during the 2015 earthquake depended exclusively on local springs, others also used these local springs as an alternative or supplemental source of drinking water. This dependability has established the small schemes and springs as a reliable alternative water source when larger systems seem to inevitably fail in times of disasters.

Just as they prefer the taste of spring water, community members are fully committed to continuing to manage and maintain these small water supply schemes. Although the ownership of these sources is de facto, community groups fully own the small water and the supply scheme infrastructure. The community leaders we interviewed were very confident that they will continue to manage these schemes even after the large ADB-supported project comes online and begins to supply water to the town. The small schemes are also preferred by poor and marginalised groups as there are no or little tariffs to be paid to access the spring’s water, unlike the larger project.

The large-scale schemes provide piped water to individual households, for which installation costs and monthly tariffs must be paid. On the one hand, the municipal water supply is too expensive for poor families, as

it is linked with a water tariff. On the other, people residing in informal settlements do not have access to the municipal water supply system in the absence of required documentation, consisting of a land registration certificate to enable them to get a piped connection. In consequence, local water sources are likely to remain these households’ continued source of water.

“**The small schemes are also preferred by poor and marginalised groups as there are no or little tariffs to be paid to access the spring’s water, unlike the larger project.**”

Having recognised this nuanced situation, water is often difficult to share and distribute, and conflict often arises between households. Under-privileged communities often depend entirely on ad hoc access to smaller, nearby water sources or local springs. They have to rely on community taps. During our survey, we found that 7% of the people visiting *Rawal Dhara* did not have piped water connections. *Rawal Dhara* is a popular public tap erected at a spring source. However,

this tap is also used by well-off people with access to piped water at homes. Each day several hundred people come to collect water from this tap, and sometimes conflicts arise over sharing the tap water.

“*We have community pipe connection for water supply but not a drop of water comes through the pipe, we depend entirely on local springs nearby.*”
(Interview with a squatter, Interview note, 2019, SIAS)



Figure 4: Diverse water management schemes of Bidur

4. THE BASIS OF THE POLICY BRIEF

The information and evidence underpinning this policy brief is based on five years of field research conducted between 2014-2019. Data were collected through a range of qualitative and quantitative techniques. The field research started with inception meetings with city-level officials and community leaders to explain the purpose of the research and seek their cooperation in 2014. In the next step, we conducted a geographic mapping of 31 community water users committees and key informant interviews to understand and document the history and their institutional arrangements for water management (see Figure 3 for the old municipal area of Bidur).

We surveyed 32 visitors at *Rawal Dhara* spring to understand their use and dependencies on the local spring along with structured observation to examine the frequency of people visiting the spring to collect water. We also conducted a household survey to understand the coping mechanisms

of individual houses after the 2015 earthquake. Finally, we undertook some participatory research activities, such as co-organising water forums with the municipalities in 2019.

5. DIVERSITY MATTERS: A NEW WATER SUPPLY SYSTEM FOR THE TOWN

The Bidur water supply system shows that diversity inbuilt into the urban water supply strategy is important for water security. The town has multiple sources of water in its vicinity, but accessing these in practice is not easy. The government-led and ADB-supported project taps water from the river. The water user committees tap one or more spring water sources from the neighbouring mountains. Some of the schemes collect water

“ Under-privileged communities often depend entirely on ad hoc access to smaller, nearby water sources or local springs. ”

supplied by one user committee and distribute it to households under the name of a different user committee, though their source is the same.

As 60% of Bidur residents were left out from the existing municipality-supported formal, large



Figure 5: Small-sized community-based water users committee supply private taps to households (Photo: Kaustuv R. Neupane/SIAS)

system managed by the BDWSUC, the rest turned to several smaller community-led water supply systems in the town, especially in the southern suburban areas. These community-led projects emerged after 1996 in Nepal when the state was paralysed by nation-wide conflict, which left the town without an elected local government.

This sort of diversity in water management strategies within a small town gives fascinating insights into how water could be managed within the urban community. Small springs and schemes are found to be reliable in terms of access, regularity, and quality of water. While large schemes can supply water to large portions of the town at a more efficient operational cost, small schemes are equally useful for water supply to the people living near the source areas. There is also a nominal effect of any damage in small water supply schemes. Hotels and small industries that require more water buy it from tankers or bottled supplies despite the high cost. In practice, diversification is the norm in Bidur, as several single households are connected by multiple water pipes so that they can have alternatives in case the main supplies fail, which has occurred numerous times over the years. As the likelihood of unprecedented stresses to the supply system remains high, including the risk of future disaster, the importance of diverse water sources to households is part of a strategy that constitutes effective water management in this context.

“ The Bidur water supply system shows that diversity inbuilt into the urban water supply strategy is important for water security. ”

6. MOVING FORWARD

Bidur is facing heightened water scarcity, similar to other Himalayan towns, despite the efforts of government agencies and dozens of local community groups. This is partly because there is an absence of a strategic or holistic approach to manage and create synergies between the multiple schemes and projects of water supply that are currently active or that are planned in the town.

First, the Bidur model of promoting diversity of water management strategy could be a useful model for other lower Himalayan towns that have multiple local water sources. As the Bidur experience shows, a complex mix of government, community, and private systems of water supply can emerge side by side in Himalayan

towns. Large-scale water supply schemes may be vital for meeting growing water needs and some water quality standards, but the significance of small-scale and locally managed schemes should not be underestimated nor undermined. Such schemes can be a lifeline during times of crisis to ensure water access to people who have limited finances and capacity to participate in more expensive

or complex schemes. Further, recognition of local people's preferences for spring-sourced drinking water is important and, where environmentally and practically feasible, should be enabled, supported, and catered to.



Figure 6: Bidur water forum (Photo: KBP/SIAS)

Second, creating research-informed planning and discussion forums at the community and municipality level is important. Focused and continuing dialogues among municipal authorities, researchers, and all prominent water actors are vital to explore, inform, and develop measures to ensure sustained and equitable supplies of water. In the *Pani Chautari* or Water Forum that we supported during our research, our research team stimulated stakeholder discussions with research-based evidence and knowledge. For instance, in the Water Forum organised in September 2019, the municipality came to recognise the need for better recognition of the twin-track strategy of supporting larger and smaller projects simultaneously. Following this *Chautari*, the municipality is actively supporting existing small-scale schemes and local springs through municipal planning and budget allocations.

Since providing support to and regulating multiple small- water-user committees could be expensive for the Municipality, it is deliberating over whether to develop a policy to categorise different types of community schemes, and to ascertain the developmental and regulatory needs associated with each category. These issues became a matter

on the Municipality agenda following the sharing of research insights by SIAS. This also demonstrates the value of independent research and its incorporation to support municipal-level planning.

Third, the Municipality needs a comprehensive water security strategy, taking into account the current and future scenarios of water demand and supply. Scenario-based planning has particular

relevance in light of the growing problem of climate change affecting water supply. Along with this, the town could consider prioritising technological solutions in low-cost technologies in line with nature-based solutions—such as source conservation, rain water harvesting, climate adaptive recharge ponds and pits, and through generating awareness for behavioural

changes for the more efficient use of water, as well as in the modest-size water infrastructure project (Ojha et al., 2020). These options require the collaboration and cooperation of multi-scalar government and stakeholders. In this way, integrated planning is a prerequisite for making towns resilient to external shocks, whether from short-term, sudden shocks such as earthquakes, or longer-term changes arising from climate change.

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ENDNOTES

- ¹ This is part of the nation-wide Small Towns Water Supply and Sanitation Sector Project (STWSSSP)
- ² Draft Feasibility Report, Bidur Drinking Water Users Committee, ADB. September, 2014

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