

WATER CONFLICTS IN URBANIZING REGIONS IN THE HIMALAYA: CASE STUDIES FROM DHULIKHEL AND BIDUR IN NEPAL

Kamal Devkota^{*1}, Dil Khatri¹ and Kaustuv Raj Neupane¹

ABSTRACT

Evidences suggest the growing problem of water scarcity in Himalayan towns due to rapid urbanization, variation in land use and climate change. The scarcity has led to different forms of water related conflicts. This paper documents the drivers and dynamics of water related conflicts in Himalayan towns and explores the potentialities for cooperation in resolving these conflicts based on detailed case study of two mid-hill towns in Nepal. Data were gathered using key informant interviews, focused group discussions, stakeholder consultations and participant observations. The key forms of conflicts emerged from the case study include a) upstream-downstream contestation for access to and/or control over water; b) tension caused by disparities in water distribution within urban region and c) competing use of water for domestic and other purposes. The major drivers of such conflicts include growing water demand both in upstream and downstream areas, declining water sources exacerbated by climate change and urbanization. In both cases of Dhulikhel and Bidur, water for municipal supply was acquired from upstream rural areas using political influence. However, the agreements forged between towns and upstream villages were later contested by empowered upstream people. This suggests that socio-political relations have key role in governing water access. Insights from these cases reinforces the argument that local water management is a political agenda and resolving contestation and conflicts require enhanced

* Corresponding Author: kamal@sias-southasia.org

¹ Southasia Institute of Advanced Studies (SIAS), Nepal.

cooperation and deliberation. We see the need for institutional mechanisms for forging cooperation and inclusive decision-making practices towards better local water governance.

Keywords: Water conflicts, urbanization, upstream-downstream cooperation, Himalaya.

INTRODUCTION

A study suggests that two-third of the world population is living in extreme water scarcity at least one month a year (Mekonnen and Hoekstra, 2016) and the situation is likely to further deteriorate due to rapidly growing urban population (UN Water, 2018). A United Nations report stresses that the growing problem of water stress is not only due to urbanization and population growth but it is also because of changing pattern of water use. On the one hand, the existing water sources are declining, and drying in some cases, while on the other, per capita water use is increasing resulting into the overall increase in water demand (Bartlett, 2003; Bhatia and Falkenmark, 1993) as urban lifestyle demands more water for showers, washing machines and flush toilets (McDonald et al., 2011). The increasing water stress is leading to contestations and conflicts over water resources (Falkenmark, 1992).

There are different forms of water related conflicts or contestations. Some are related to access to and control over water resources while others are linked with distribution (Water Aid in Nepal, 2012). The most prominent form of contestation appears to be between upstream communities

and downstream users. The upstream-downstream conflict is, in most of the cases, between rural and urban dwellers as the water sources for the towns are in upstream rural areas (Celio et al., 2010). This also reflects the contestation between relatively wealthy urban dwellers and poor rural communities who live with subsistence farming, in most of the cases (Slaymaker and Bain, 2017). Another important form of contestation is related to distribution of water within urban areas. For example, corporate clients and few wealthy people are often privileged with better access to water with better quality, while poor people in marginal areas, i.e., informal settlements, are bound to live with scarcity (Malama and Kazimbaya- Senkwe, 2004). This suggests that the water related conflicts are linked with political economic structure and power dynamics in the society (Swyngedouw et al., 2002).

Accelerating conflict and contestation over water resources has drawn increasing scholarly attention in recent decades. There is an emerging body of literature that delve into multiple dimensions of water conflict (Just and Netanyahu, 2012; Link et al., 2016). Yet, issue surrounding trans-boundary water conflicts has got relatively greater attention compared to local and municipal level conflicts (see Wolf et al., 2003; Zeitoun

and Allan, 2008; Swatuk and Wirkus, 2009). The literature on trans-boundary water governance and conflict primarily deals with the sharing of freshwater resources (Gooijer and Thomasson, 2006). A key emphasis of this body of work has been the political dynamics and political-economic relations between different countries (Zeitoun and Mirumachi, 2008; Mollinga, 2008) and stresses for understanding governance of water resources as political process.

A growing body of literature has started to emerge on local water governance (Mweemba et al., 2010; Funder et al., 2010). There are studies on diverse aspects of local water governance focusing on urban (ibid) as well as peri-urban areas. For instance, Mehta and Karpouzoglou (2015) examine the water governance in peri-urban areas focusing on social complexities and inequalities. Similarly, Vij et al. (2018) explores the dynamics of core – periphery conflict in Gurgaon of India. These studies explored the diverse factors of water stress. Yet, more focus has been on demand side issues like population pressure, agriculture productivity, economic development and less has been done on supply side issues (Bohmelt et al., 2014). However, there are very few cases of violent conflicts over local water management.

As the water stress in Himalayan towns are mounting every day, it becomes vital to understand the political dynamics of water conflicts. This paper seeks to contribute to this emerging field of local water conflict by examining the drivers and dynamics

of water related conflicts in the growing Himalayan towns. The issue is explored examining case of two mid-hill towns of Dhulikhel and Bidur of Nepal.

The inquiry is inspired from urban political ecology (UPE). The UPE approach allows to explore the political, economic, and ecological processes underpinning access and control of water at local level (Heynen, 2016). It provides lenses to explore who gets or controls water resources and at what costs, in other words, who benefits and who suffers from particular processes of socio-environmental change (Swyngedouw and Heynen, 2003; Heynen et al., 2006; Desfor and Keil, 2004). Urban water management is highly complex and extremely political issue (Dabelko and Aaron, 2004; Swyngedouw, 2009) and water management, as a hybridized socio-natural flow fuses together nature and society in inseparable manners (Swyngedouw, 2006). In this context, UPE offers analytical lens to unravel these conflicts, complicities and political dynamics as it helps examining urban water governance issues from political ecological perspective (Swyngedouw, 2009) Angelo and Wachsmuth, 2015). For instance, it analyzes who has the power (by custom or law) to use the available water from a river or to dig wells that reach the water table excluding others (Rodríguez-Labajos and Martínez-Alier, 2015). This paper examines the different aspects of municipal water governance and dynamics of conflict and contestations taking insights from the UPE. These conflicts involve unequal power

relations and political influence in access and control of water sources. This dynamics are caused by unequal distribution of water within the towns (Ranganathan, 2014) as well as rural-urban water transfer (Hommes and Boelens, 2017).

The towns of Dhulikhel and Bidur have been facing the challenge of water scarcity in recent decade and the primary reason is the escalating demand of water due to rapid urbanization (Devkota et al., 2014; Devkota and Neupane, 2018). As we will elaborate in this paper, the agreement reached between municipalities and upstream rural areas are contested challenging the earlier power configurations and new conditions for negotiations are emerging. Further, there are also issues of distribution of water within the towns, for instance, residences and hotels in core area of Dhulikhel are privileged to get water from municipal water supply system, while the residents from periphery region areas are deprived of municipal water system. These are the cases of UPE where we examine the dynamics of power and different forms of marginalization that exist in both Dhulikhel and Bidur.

The examination will be primarily driven by the question of how water conflicts are determined by power and politics. Such examinations will be informed from the earlier work (Cornea et al., 2016; Swyngedouw, 2009) on contestation over access and control of resources by different actors. We focus on two major forms of contestation; upstream-downstream, and

equitable distribution of water within municipalities. In each aspect, we will explore the patterns of conflict, and the underlying drivers that relates to the changing ecological, socio-economic and political dynamics in both upstream and downstream areas.

This paper is divided into six different sections. This introduction follows the description of field sites in section two and then methods in section three. The key patterns, drivers and dynamics of water conflicts from the cases are explained in section four. Analysis and discussion in section five is followed by a brief conclusion in section six.

FIELD SITES

Small towns (like Dhulikhel and Bidur of Nepal) in the western Himalaya – the residence of about half of the urban population in the region, rely on springs, streams, lakes and rivers for drinking water. The supply systems are managed and governed through a variety of approaches and institutional arrangements. Across this region, widespread urbanization and decreasing spring water flows have increased pressures on water supplies leading to local conflicts (Devkota et al., 2015). Water stress is compounded by inequitable access and distribution of water across the region. Hence, the management of drinking water in small towns of the Himalayas is a critical challenge.

In Nepal, while the contestation of different communities for water use increased, local government - the responsible authority to deal with such issues, remained without elected representatives from 2002 to 2017. Hence, the local level decision-making including resource governance was adversely affected by the local political context (Carter Centre, 2011). In light of this, water related policies premised upon the assumption that the elected local governments would facilitate for its implementation were equally affected. Hence, the issues of water related conflict, contestation and negotiation remained unresolved. Two small towns Dhulikhel and Bidur discussed in this

paper are the illustrative cases of the gap mentioned above.

Dhulikhel is a small hill town located at 30 km east of Kathmandu (Figure 1). The town is situated at 1441 meters above from the sea level. Before the local government was restructured in 2016 (during this study), Dhulikhel used to cover an area of 14.01 sq. km consisting of 9 wards. Geographically, ward no. 1 and 6 were in relatively rural area, whereas the remaining wards were urban in nature. The population size was 16,263 residing in 3,291 households (CBS, 2011) in Dhulikhel. The town is situated in between two small catchments, namely *Punyamata* and *Jhikhu*.

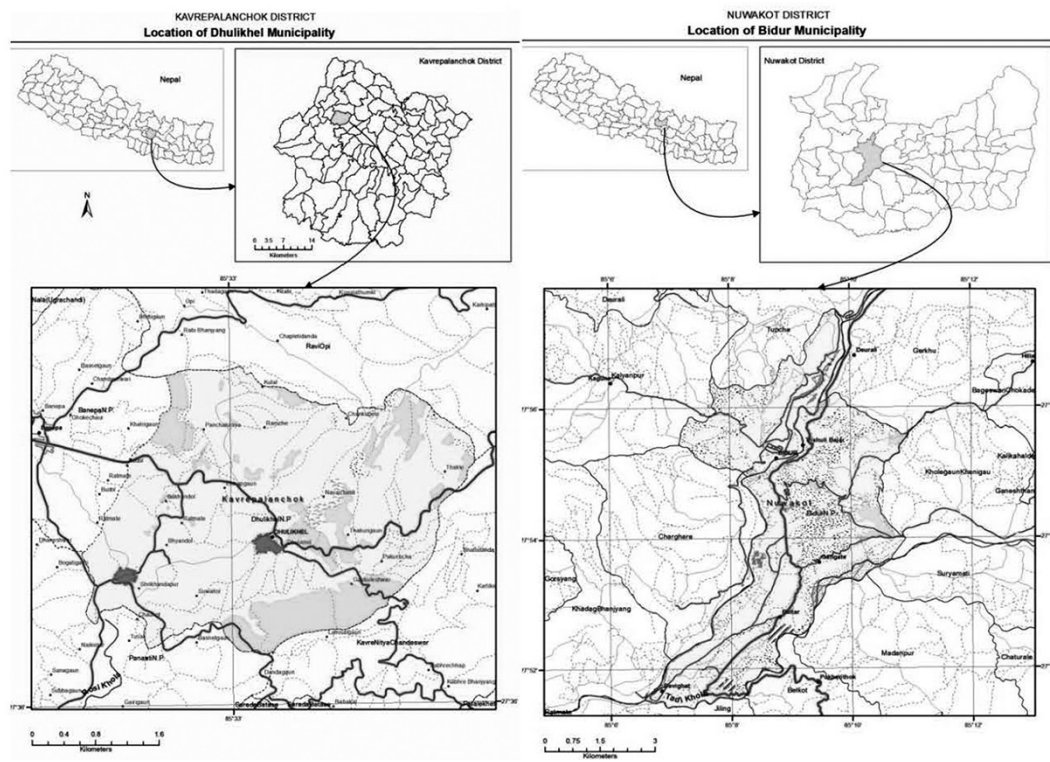


Figure 1. Research sites

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Dhulikhel is facing challenge of meeting the ever-growing demand of water supply to its population. The water management challenge is also linked to expansion of the city with regard to increasing number of hotels due to boost in tourism businesses, expansion activities of Kathmandu University and Dhulikhel Community Hospital and water intensive small businesses such as party venues and poultry farms. The gradually decreasing volume of water in the existing sources has further exacerbated the problem. The decline in supply is also affected by variable rainfall regime (Ghimire et al., 2016).

To meet the increasing demand, the municipality has been actively engaged with upstream areas located about 14 km away from the town, Bhumedanda village in the Roshi Watershed. Dhulikhel municipality approached Bhumedanda in 1980s for the first time when Dhulikhel municipality received funding from German government

for a drinking water supply project. A community led water users' committee now operates this system and supplies water to most parts of the town. Prior to this project, Dhulikhel used to rely on small local springs located within the town. Currently, there are three major sources that supply water to Dhulikhel dwellers i.e. piped water from Bhumedanda, local springs and ground water. There is increasing trend of installing deep boring by community and hotel owners.

Being the district centre of Kavre district, Dhulikhel is a hub for major political decision-making in the district. Also being a satellite town of Kathmandu, Dhulikhel is influenced by politics in Kathmandu. It used to be a regular touristic destination of the former King and his family, senior government officials, political leaders and security personnel. Such political connections helped the local leaders to seek funding and investment in the relatively bigger projects.

Likewise, Bidur - the district centre of Nuwakot is about 68 km northwest from Kathmandu (Figure 1). Its altitude ranges from 470 meters to 1154 meters and is located on the bank of Trishuli and Tadi rivers. Bidur was declared a municipality in March 1987 by merging surrounding villages namely Bidur, Bhairavi, Trishuli and some parts of Tupchhe. As per the census 2011, 26750 people lived in 6270 household in Bidur. Bidur is one of the gateways to China through Rasuwa border via Pasang Lhamu highway.

Bidur has multiple water supply systems. There are 32 formally registered community led drinking water user committees. Among them, Bidur Drinking Water and Sanitation Users Committee (BDWSUC) manages two larger water supply systems that supply water to about 2000 households. Besides, there are some unregistered drinking water user committees within the municipality to manage small-scale water supply systems. All these committees rely on local springs, rivers, hydropower canal and springs from upstream areas for water.

Among two larger water supply schemes managed by BDWSUC, first one taps water from a small spring from Jiling village that lies about 8 km southwest of the town. Water was tapped from early 1980's from this spring to supply water for the southern part of the town. Another is the Phalankhu Khola scheme, which gets water from a stream at Gerku village and Trishuli river. This scheme is the biggest one and the source is located about 16 km north of the town. This scheme supplies water to the northern part of the town. However, users do not fully rely on this water to drink because of high level of turbidity. People collect drinking water from the locally available small springs.

METHODS

This paper is produced from our two and half years long study on 'The Political Economy of Water Security, Ecosystem

Services and Livelihoods in the Western Himalaya'. In this study, data is collected in two stages using different methods. Field study began with key informant interviews (KII) to identify existing sources of water, their status and threats to sustainability. By using snowball sampling method, we further identified pertinent governance issues through KII. After broad mapping of water sources and their status, management and governing practices and the generic list of stakeholders for the specific schemes were prepared. We conducted detailed semi-structured interviews with water user committee members, water users both in town and in upstream catchments. Our questions during the initial semi-structured interviews were mainly around identifying the water governance issues, reason behind those issues, actors and institutions involved in the issue, their interest and incentives etc. In addition, we also conducted interviews with people and organizations involved in negotiation and decision-making from both upstream and downstream community including former local government representatives. External actors such as donors, representatives of Secondary Town Integrated Urban Environment Improvement project, sectoral experts and NGOs were also interviewed. We held focused group discussions, stakeholder consultations, participation and observation to the public hearings. Following table (Table 1) shows the details of data collection tools and number and types of respondents and participants.

Table 1: Description of respondents

Description of methods	Numbers of events	Number and types of respondents
Key informant interviews	Dhulikhel- 31 Bidur-12	43 respondents including local political leaders, representatives of water user committees, small entrepreneurs, up and downstream water users, local government officials.
Focused group discussions	Dhulikhel -3 Bidur -3	6 FGDs among upstream communities, members of water and forest user committees, downstream water users.
Stakeholder consultation meetings	Dhulikhel -2 Bidur – 1	About 20-30 (30 in Bidur, 20 and 25 in two meetings in Dhulikhel) participants in these meetings representing government organizations, water user committees, local media, NGOs, local political leaders and people from upstream areas.
Observation of public hearings	Dhulikhel-1 Bidur -1	Dhulikhel: Public hearing held in Bhumedanda was hosted by KVIWSP to discuss on on-going contestation between up and downstream communities. There were about 50 participants including representatives from ADB, KVIWSP, local people from upstream areas. Bidur: Public hearing was hosted by BDWSUC to discuss on the feasibility of the new drinking water supply project in Bidur. There were about 150 participants from BDWSUC, local people from Bidur, journalists, water user committee members.

Using these tools, we documented the stories of the conflict/contestation over water resource management. Interviews and FGDs were audio recorded and transcribed. The audio record of the interviews and meetings were done with prior consent with respondents and identity of respondents is anonymized in the writing. Six different cases of conflicts/contestation were identified from the initial field study in two sites. Later, three of the cases were selected for detailed investigation based on (i) drivers of those conflicts, (ii) dynamics of power exercise (iii) their resolving strategies and (iv) consequences of the conflict. Key patterns of conflicts were identified through the review of transcription and field notes. Secondary data specifically

the municipal annual plans, documents of various agreements with upstream communities, meeting minutes of water user committees, application and approval documents for the water use were also used in the case study materials.

CASES OF WATER CONFLICTS IN DHULIKHEL AND BIDUR

CASE I: Upstream and downstream conflict over water access in Dhulikhel

This is the case of contestation between Dhulikhel municipality and upstream catchment of upper Roshi River over the

access and control of water. It details out the competing claim over access to declining water sources by Dhulikhel municipality and upstream users. The agreement reached in 1980s has been contested by upstream communities leading to a series of negotiations and agreements between upstream and downstream authorities. As we elaborate, with changing socio-political and environmental context, the previous agreements have been questioned by the upstream communities.

Roshi River flows through Bhumedanda village and passes the town of Panauti. The river has five major tributaries namely Kharkhola, Bairamahadev, Sisha Khani, Muldole and Gudgude, all originating from Mahabharat range. Dhulikhel has been tapping water from Kharkhola since early 1980s. The river has been also a good source of water for farmers residing in Bhumedanda village who use water for irrigation and running traditional water operated grinding mills along with other domestic usages by the village dwellers. Besides, inhabitants of Panauti municipality have also been using this water for irrigation and domestic purposes.

During early 80's, Dhulikhel was in search of a reliable water source for the drinking water project to be funded by the German government. Leaders from Dhulikhel

approached the local representatives in Bhumedanda to access the source of water from Roshi river. Former Pradhanpanch² of Bhumedanda noted: *“the initial attempt of Dhulikhel to explore water source at Sashipani was unsuccessful. Then, district Panchayat³ chairperson who was my good friend came towards us with a proposal for seeking potential water source from Bhumedanda.”*

Later, village Panchayat⁴ meeting of Bhumedanda decided to allow Dhulikhel to tap water from Khar Khola. There was an agreement between two communities on 27 July 1985, signed jointly by Pradhanpanch of both the villages. As per the agreement, while tapping water from Kharkhola, Dhulikhel municipality agreed to provide financial support to build a school in the upstream village of Bhumedanda that was swept away by the 1981 Roshi river flood.

As per Bhumedanda's then Pradhanpanch, the agreement became possible because of three main reasons: (i) There was no water scarcity in the upstream area and people had a belief that water source should not be restricted to use by others; (ii) Influential people in local level decision making in both the villages had cordial relation and (iii) The vibrant leadership of then chairperson of district Panchayat to negotiate with upstream community was instrumental.

² Pradhanpanch was the elected head of Village Panchayat—then lowest government unit in Nepal.

³ District Panchayat was the district level government entity headed by the chairperson during Panchayat era in Nepal.

⁴ Village Panchayat was the lowest local government body in Nepal during the Panchayat era (2017 – 2046 BS).

This agreement was in effect for about 25 years ensuring water access to Dhulikhel. Later, the upstream dwellers contested the agreement and mounted pressure to redefine it in 2014. We heard the critical voices against the agreement during our fieldwork in 2015. Some young people contested the idea of providing water to Dhulikhel and threatened to block the water

supply. They argued that Dhulikhel ignored the customary and riparian rights of the upstream community. However, such critical voice and contestations were overlooked by the Bhumedanda⁵ VDC primarily because Dhulikhel had been providing financial contribution for the development of the upstream area.

Table 2: Agreement details between up and downstream Dhulikhel

Agreements	Agreed date	Party A and signatories	Party B and signatories	Facilitators
<i>Agreement I:</i> To provide water to Dhulikhel from Khar Khola at Bhumidanda	Jul-27, 1985	Dhulikhel VDC – Pradhanpancha	Bhumedanda VDC– Pradhanpancha	
<i>Agreement II:</i> Accessing water for three major towns of Dhulikhel, Banepa and Panauti from Roshi river and its tributaries (including Khar Khola) at Bhumidanda	Mar-12, 2010	Kavre valley integrated drinking water supply project, Political leaders of 7 major political parties from three towns	Bhumidanda VDC- VDC secretary and 6 local political leaders - 2 from each party (Nepali Congress, Communist Party of Nepal – Unified Marxist and Leninist and Communist Party of Nepal (Maoist))	Municipality officials, Urban environment improvement project
<i>Agreement III:</i> Increment of water volume from Khar Khola at Bhumidanda to Dhulikhel	May-08, 2011	Dhulikhel drinking water and sanitation user committee	Bhumedanda VDC Secretary in presence of three APM* members	Dhulikhel municipality, Kathmandu university, Dhulikhel hospital, District water resource committee

* APM-All Party Mechanism was a local structure formed in the absence of elected local government to facilitate the local level decision making mainly on planning, budgeting, and implementing development projects. Representative of existing political parties used to be the members of APM.

Source: Formal agreement papers between upstream and downstream users

⁵ As per the record by Dhulikhel Drinking Water and Sanitation Users Committee – About 11 million Nepalese rupees has been compensated to the upstream communities till end of 2018.

Dhulikhel was in dire need of more water sources to meet the increasing demand primarily because of expanding urban areas and tourism activities. To meet the expanding water demand, three adjacent municipalities (Dhulikhel, Banepa and Panauti) agreed to pursue a bigger project called Kavre Valley Integrated Water Supply Project (KVIWSP) and seek financial support from the Asian Development Bank (ADB). The source for the new project was also sought from tributaries of Roshi River including Khar Khola. ADB agreed to fund the project and the three municipalities entered into a new contract in March 2010 to build a new drinking water project using water from Bhumedanda and Kushadevi (from where four other tributaries of Roshi originated).

Further, Dhulikhel indirectly approached Bhumedanda and made third agreement between Dhulikhel (alone) and Bhumedanda village to increase the size of existing water pipe that was installed by German supported project during mid 80's. Following table 2 provides the detail of agreements among the different parties to share the water at different point of time.

Local political leaders and VDC secretary made series of agreements with downstream users. This has challenged the existing local uses in upstream area primarily for irrigation and running water mills. Dwellers of Bhumedanda contested the latest agreement during interview and consultation process. Their key concern was that the agreement made in 2010

and 2011 emerged out of inadequate consultations with upstream communities thereby putting the interest of local people in peril. One of the local water users remarked: *"Agreements were forged with the consensus of limited local political leaders"*. Another farmer added, *"The agreement was done without consultation with the real users. This will hamper the ongoing water use in the upstream region"*. He further demanded the clarification from the signatory leaders.

Grievances of local users manifested in different forms. They formed a committee called *Nagarik Sarokar Samiti* (often called Local Concern Committee-- LCC) to protest the agreement. The committee discussed with water users, water millers and sensitized them to speak against the water supply project. They wrote slogans against the accord in the public places, prepared 19 points demand to the project (KVIWSP) as compensation, obstructed the construction activities from the beginning and asked the project to clarify about the possible impacts of the project on the local people. The 19 points demand was sent to the Asian Development Bank (ADB) office in Kathmandu. ADB took this demand seriously and hold discussions with LCC. Several rounds of meetings took place among LCC, project coordination committee and Dhulikhel Municipality to discuss on the 19 points demands. Local people led by LCC obstructed the project implementation (denied pipeline installation) causing further delay in implementation of the project.

The LCC claimed that- they have been relying on this water to earn their living from a very long time and hence they have first right to use this water. Nevertheless, the agreement with the local political leaders failed to represent the real user's interest of the upstream. On the other hand, the downstream users (DDWUC and the ADB supported project) accused the multiple interest groups such as the LCC were creating barriers for the project implementation. They complained that the upstream communities were not consistent in their demand and kept adding one after another.

Several meetings and negotiations were conducted among the conflicting communities to resolve the contestation. Even informal agreements with the upstream communities were made. A user from the upstream community revealed that the champions of forging this agreement got compensation in cash and kind including free treatment in Dhulikhel hospital. This sort of informal compensation put temporary hold to the on-going protests. In closer examination, these agreements were found to be myopic and fragmented serving a handful of local elites.

Consultative meetings with stakeholders were also organized by third parties. As a part of participatory action research, Southasia Institute of Advanced Studies (SIAS) facilitated a stakeholder meeting inviting representatives from up and downstream communities, local government and APM members. Similarly, KVIWSP hosted a

public hearing where local users put forward their concerns to the project team including officials from the ADB. Leading representatives from three municipalities, project officials, local people attended the public hearing, however, the members of APM did not participate. A participant in this program revealed: *"the absence of APM representatives in this public hearing program indicates the possibility of collusion among them against the local users."* Another participant demanded the APM members presence in such hearing. As there were no elected representatives at local level, members of APM were involved in most of the negotiations. Locally affected people shared that the negotiation and compensation benefitted only the leaders who played a major role in establishing agreements, which has created an issue of accountable decision making in the village.

The emergence of LCC to raise the collective voice of community was another initiative to resolve the conflict. However, there was a critical voice from the downstream community – whether the LCC represents the common concern of the locals. Still there were several discussions on the 19-point demand put forth by the LCC.

Efforts for resolving conflict have contributed to establish a short-term compensation mechanism to the affected communities in the upstream region. KVIWSP project also offered to provide support to upstream communities. Water millers got 77 thousand rupees each from the KVIWSP to renovate their mills to run it with less use of water.

Another major output of negotiation consists of the plan to renovate existing irrigation canals and small drinking water supply system in Bhumedanda.

The contestation also resulted into several negative consequences. Social harmony between two communities deteriorated. Obstacles created by the local people have adversely affected the completion of the project. As per the Semi-Annual Environmental Monitoring Report 2018, the delay in implementation has increased the cost of project by about 28%.

CASE II: Upstream and downstream conflict over water access in Bidur

The second case is on the informal agreement made about two and half decades ago between two communities on sharing water being questioned by the politically aware new generation of the upstream region of Bidur municipality. This also demonstrates the raising prominence of water rights in the changing environmental and political context.

Majority of the Bidur municipality gets drinking water from two different water supply systems managed by the Bidur Drinking Water and Sanitation Users Committee (BDWSUC). BDWSUC taps a perennial spring located at 7 km south from the town (Nalagaun) and another river from northern part (Pairebesi) to supply water to

the southern and northern part of the town respectively. Initially, Bidur municipality used to manage the water supply system which later was handed over to BDWSUC in 1996. Apart from the two major sources, there are number of other local sources from where people obtain drinking water.

During the early 80's, Jay Prasad Gajurel and Lumidi Prasad Gajurel both from the Nalagaun were Pradhanpanch of Jiling village Panchayat and chair of District Panchayat of Nuwakot district. While searching for the water source for the town, people from Bidur reached Nalagaun and identified Chhahare spring as a potential source and since 1982, Bidur has been tapping water from the very spring. 4.8 litre per second of water from this source is being distributed to 1255 private and 130 community taps in the southern part of the municipality. The clan relation of Gajurel eased the negotiation between Bidur and Nalagaun to agree on water supply system.

Locals of Nalagaun have been using water from the Chhahare spring to irrigate their land for a long time. During the initial period, people in Nalagaun did not experience water shortage as they used to plant crop only one season a year and the volume of water in the source was sufficient. With the decreasing volume of water in the source and increasing demand of water due to change in the cropping pattern, water crisis became a grave problem. Realizing the gravity of the situation, people from Nalagaun raised concerns regarding the water being supplied to Bidur.

On the contrary to the situation in Nalagaun, BDWSUC tried to increase the volume of water to distribute more water in the city. They further tried to purchase the private land close to the existing source and tap additional sources of water. Residents opposed the plan and filed complain at the office of the Chief District Officer (CDO).⁶ CDO promised to halt the plan. In June 2008, a broad agreement was made between Nalagaon Drinking Water Conservation and Mobilization Committee⁷ and BDWSUC to cooperate with each other on managing water. The agreement stated that NDWCMC was not entitled to create barriers on sending water to Bidur and BDWSUC agreed to make appropriate compensation to the upstream people as per the requirement. Having said that, BDWSUC has made no attempts to increase the water volume from the source but the symbolic tussle between two communities continued.

In addition to the tussle over the water source, there has also been the issue of crop damage by the pipeline outburst. Water pipes laid underneath the cultivated land had broken several times thereby destroying crops. Landowners protested the crop damage demanding compensation for the crops. During our interview, they complained that neither they can build permanent building nor sell the land

where the pipeline is laid. They asserted that the value of their land has decreased because of the pipeline. On the contrary, BDWSUC claimed that the source is properly registered at the District Water Resource Committee as per the government rules and they have the right to bring water for drinking. They also claimed that the compensation to the victims during crop damage has been provided.

The upstream farmers also complained about the shortage of water for irrigation, but their voices remained unheard. A local farmer reported that their grandparents were illiterate and innocent hence easily agreed to provide water to Bidur. But now the young generation have realized the importance of water and hence are claiming their preferential right over water. Similarly, a group of local users during FGD claimed that there was only a verbal agreement to allow Bidur to tap water, but it was not binding. They shared the experience of being wrongly treated by people of Bidur while visiting the town for administrative works. Another participant from the FGD explained that they have moved their irrigation canal intake 1.5 meter below due to the Bidur's pipeline. This left some land above the canal unirrigated. He further added that during the dry season, they do not get water for irrigation. The locals

⁶ CDO—Chief District Officer is the head of district water resource committee who regulates the water management in the district.

⁷ A committee to manage water to the source area and negotiate with Bidur.

from upstream also claim that BDWSUC has faltered to deliver their end of the agreement since their request for support for the construction of road in the village had not been addressed.

On the contrary, representatives of BDWSUC defend their action citing how they have adhered to both the formal rules as well as verbal agreements with the upstream communities while collecting water. Former Chairperson (BDWSUC) said:

We have the water source of Nalagaun registered under District Water Resource Committee as per the water resource act of Nepal. We paid compensation for the damage caused during construction of the pipeline. But nowadays, referring to local rights on natural resources, some of the residents are raising voices against the water supply project. They want to see water flowing down to Tadi river without any use. To confront them, sometimes we have told - we can also obstruct them while visiting Bidur to get administrative services.

There is a trend of migration of relatively well-off people from Nalagaun to southern part of Bidur. This suggests Bidur is the place of destination for both politically influential and financially well-off people from Nalagaun. After migration, they become the beneficiaries of water supply project. This type of kinship as well as political-economic relationship of downstream users with the upstream farmers has averted intense conflict for several years. However, along with the socio-political change and emergence of new generation of youth in

the upstream region, the dissatisfaction on water sharing with Bidur has been gradually manifested.

As mentioned above, some initiatives to resolve the on-going squabble between up and down stream communities have focused on settling the immediate issues like crop damage due to water leakage. This sort of negotiation is normally held between individual farmer and the BDWSUC. Such fragmented approach to resolve the contestations have not resulted into longer-term solution. It has rather gradually deteriorated social harmony between up and downstream communities.

Case III: Conflict between water rich and poor zone within Dhulikhel

The third case is about the conflict between two adjoining communities in Dhulikhel, one with better access to drinking water and the other with poor access. The case demonstrates the issue of disparities in water access and the struggles of the deprived community for equal share in water.

Dhulikhel village panchayat was converted into Dhulikhel municipality by merging some periphery villages in 1986 to fulfil the requirement of German government supported drinking water supply project. However, the proposed water supply project was designed for core town only (i.e. previous

Dhulikhel and ward no 2, 3, 4 and 5 of the newly formed municipality). This means, the project included the core town, dwelling of the traditional Newar communities. Peripheral areas of the town (i.e. ward no 1, 6, 7, 8, 9) were excluded from the project. Most of the people in these communities mainly in ward 1 and 6 are Brhamin, Chhetris and Tamang i.e. different from traditional Newar communities. These communities had marginal voice in the municipal and water governance mechanisms.

After the completion of the project in 1990, the core town of Dhulikhel got regular water supply. However, the peripheral areas had to rely on local springs. People from core Dhulikhel claimed that the project was exclusive to their area and hence reluctant to share water to the peripheral settlements. People from the periphery contested such claims and asserted that they also deserve right to access piped water supplied through the project. Such disparity in distribution of water created division between core and periphery in Dhulikhel and the people from periphery areas felt excluded from the water system and the whole municipality decision-making system.

In 1994, Dhulikhel municipality planned to invite the then Prime Minister Girija Prasad Koirala to formally inaugurate the GTZ supported drinking water supply project. However, people from periphery boycotted the inauguration ceremony demanding their concerns to be integrated in the form of an agreement. The inauguration program was cancelled due to the tension. The

municipality planned another ceremony to inaugurate the project from the then king Birendra. A group of people from periphery areas again appealed the King through a request letter (*Binti Patra*) collecting signatures of 1130 periphery residents to address their demands of equitable access to drinking water. As the king showed his interest to visit Dhulikhel and inaugurate the project, Dhulikhel municipality took initiative to negotiate with periphery communities assuring the renovation of the existing sources and improvement of the supply system in periphery region. Eventually, a short-term agreement was made to explore alternative sources of water to the periphery and king Birendra inaugurated the project.

In a bid to implement the aforementioned agreement, the municipality found an alternative source in Kushadevi village about 15 km away from the city. During the negotiation, Kushadevi demanded an annual payment of NRs 200,000 from Dhulikhel municipality. While this negotiation was underway, a larger idea of integrated water supply project to three adjoining municipalities (Dhulikhel, Banepa and Panauti) was put forward and the negotiation with Kushadevi was terminated. This new project is supposed to supply water to the periphery region.

With the delay of the proposed project and lack of initiation to improve the water supply system in the periphery region, a struggle committee was formed comprising the dwellers of peripheral areas to negotiate

with the core including key social and political representatives from periphery region. Several rounds of negotiations were held between core and periphery, but the periphery community claimed that their voices were not heard. The struggle committee submitted a protest letter (*Gyapan Patra*) to the office of the Chief District Officer and warned them of disrupting water supply to the core town. As their demand was not addressed, protesters broke the main water supply pipe from GTZ supported project. Water supply to core town was disrupted for 4 days. People from the core town had to rely on local springs and tankers. The protesters also blocked the vehicles in Araniko highway and burnt tyres.

A dialogue was held between the representatives of the then royal standing committee and major political leaders in presence of CDO. Finally, an agreement was reached wherein periphery communities were assured of piped water supply. After that, DDWSUC started sharing water to the nearby locations of periphery region. Yet, major parts of the periphery do not have access to pipe water and the DDWSUC is unable to provide water to the wider population because of water source limitation. Hence, inequality between core and periphery remains unaddressed.

ANALYSIS AND DISCUSSION

The two mountain towns of Dhulikhel and Bidur have been experiencing increasing

water shortage in recent years. On one hand, urban water demand has increased along with population growth, and on the other hand, water supply from its sources has declined due to increasing demand of water in upstream area among other reasons (Devkota and Neupane, 2018). Changing pattern of agricultural practices in upstream rural areas of Dhulikhel and Bidur from subsistence to semi-commercial farming such as vegetable cultivation led to increase in water demand for irrigation. The two cases presented above depict the relentless struggles over water for urban supply from the upstream rural areas and continued negotiations. As the case showed, the initial agreements between upstream and downstream village authorities (VDC) had been questioned by upstream communities asserting their perennial rights over water. These kinds of political dynamics of negotiating water access for the emerging towns have drawn increasing attention (see Kovacs et al., 2016). As reported by other studies, change in the socio-political conditions often demand redefining the water sharing agreement (Chan et al., 2017; Kosoy and Corbera, 2010)improving both social and ecological outcomes. But do PES and related incentive programs achieve that lofty goal? Along with considerable enthusiasm, PES has faced a wide range of substantial critiques. In this paper, we characterize seven major classes of concerns associated with common PES designs, and use these as inspiration to consider potential avenues for improvements in PES outcomes and

uptake. The problems include (1. In both cases, the series of negotiations happened through more of informal relations and political influence (Upreti, 1999), and towns which are also district centres, had greater political influence in these negotiations. In case of Dhulikhel, upstream village dwellers of Bhumedanda also negotiated financial incentive for some development projects i.e. budget to construct school building. Since both towns were district centres, political leadership played key role in reaching agreement to provide water from the villages to district centres. In consistent with the argument made by Kovacs et al. (2016), with improvement in education and access to information, capacity of upstream communities to articulate voices and interests have improved leading to the demand for redefinition of the agreements.

The insights from the cases are consistent with other studies that the rights and abilities of upstream communities to control and manage resources are dynamic (Kovacs et al., 2016). The enhanced socio-political awareness with increased education and access to information enabled people from upstream villages to articulate their voice and they started to contest the existing contractual agreements. These articulations resulted into the contestation between upstream and downstream as upstream people and in extreme cases, the upstream community even threatened to stop water supply to the towns (Swyngedouw et al., 2002, Carius et al., 2004; Zeitoun and Warner, 2006) a former mayordomo (ditch

manager. The upstream communities often argue for the preferential rights over water as they have been the traditional users.

Another important issue that emerged from the cases is the deliberation between upstream communities and municipal water governing bodies during the process of negotiation. In both cases of Dhulikhel and Bidur, the upstream communities felt that their concerns were not adequately heard during the earlier negotiations. For example, upstream community blamed that the second agreement between Dhulikhel drinking water and sanitation users committee and Bhumedanda VDC was reached without adequate discussion among key upstream actors and users. This is, in part, because there were no elected representatives in local bodies in Nepal during the period, and negotiations were primarily led by bureaucrats and some local politicians. The upstream people felt marginalized in the process citing their voices and concerns were not reflected in the agreement. Moreover, they fight for their right to environmental and social justice and particularly for water justice (Rodríguez-Labajos and Martínez-Alier, 2015). This shows the deliberative deficiency during the process of negotiations (see Heynen et al., 2006), that is often seen in other forest resource management as well in Nepal (Sunam et al., 2010; Ojha, 2008).

The third case was about the distribution of water between core and peripheral area of Dhulikhel. This is the case where the access of water to peripheral areas were denied.

Dhulikhel water scheme only included the core area of Dhulikhel municipality comprising ethnic community of Newar and excluded the settlements from neighbouring sub-urban or rural areas. The communities from peripheral areas raised their concerns on the ground that they were side-lined. This is the case of marginalization based on power and influence in water resource management (see Bakker et al., 2008). The inequalities and marginalization within cities between core and periphery are rooted in the colonial past but reinforced by more recent institutional constraints and policy failures (Simler and Dudwick, 2010). The dynamics of social tensions and conflict, particularly when spatial inequalities are common phenomenon are becoming increasingly challenging in natural resource governance including water resources (Kanbur and Venables, 2005). This supports the conclusion of Rodríguez-Labajos and Martínez-Alier (2015) that conflict over water increase in growth of the metabolism of the economy.

Overall, these three cases centred around the dynamics of power exercises and influence on access to and control over water sources and its distribution among the users. This dynamics of power and politics determining access and control of water draws attention to the urban political ecology literature (Bakker, 2012). Political influence seems to have played key role in shaping the conditions of access and control of water (Franks and Cleaver, 2007) wherein marginalizing peripheral areas of the towns and upstream communities in different ways.

The peripheral areas were denied access of the municipal water system in Dhulikhel and politically powerful people from the towns of both Dhulikhel and Bidur seem to have control over water from the upstream rural areas. The appreciation of riparian and customary rights to water use has not been considered in initial negotiations.

The role of government authorities in the process of negotiation between upstream-downstream communities is also worth noting. In cases I and II, district authorities like chief district officer, police officers and national actors like representatives from royal standing committee were involved in vital meetings and helped during the process of agreements. The upstream communities in Dhulikhel considered such decisions as elitist and heavily influenced by power and contributed to accelerate conflict, the finding consistent with other cases of conflict (Upreti, 2004). In both cases, urban political actors had better access and influence to the authorities, hence their role appeared not supportive to the marginalized ones.

CONCLUSION

In this paper, we examined the dynamics and drivers of conflict over water resources drawing on three cases from two mid-hill towns – Dhulikhel and Bidur in Nepal. We also explored the initiatives undertaken while forging cooperation among conflicting parties for inclusive water governance. The

paper provides insights for understanding the patterns of emerging conflict and cooperation on local water management and contributing towards equitable water governance in urbanizing areas in the Himalaya.

Two major forms of contestation were identified from the case studies. The most prominent form of contestation has been between up and downstream users, which is basically related to the access to and control over water sources. The contestation over access to and distribution of water in different uses has been exacerbated by competing use of water. The major driver of upstream-downstream conflict has been declining water source and competing demand. Second, major form of contestation is centred on distributional equity within urban areas. In both aspects, socio-economic structure and power dynamics played the major role in exacerbating contestations.

The increased ability of weaker actors i.e. upstream rural communities and people from peripheral areas of Dhulikhel to articulate their voices led to the situation to contest the unequal conditions of water sharing. This suggests that the political agencies are helpful for transformation in water governance underpinning unequal access and control. This further suggests that empowering weaker actors can be an opportunity for transformation towards more equitable governance. Yet, there will be a need of mechanisms for negotiations and dialogue among the key actors for resolving contestations. As we have seen in

the cases, there is a clear role of facilitation in the debate. The newly formed local governments in Nepal can play important role towards resolving these issues.

On the analytical front, conflicts and contestations over governance of natural resources including water are underpinned by complex political and socio-economic dynamics and this is not only an environmental, technical or geographical issue but also a political agenda. A deliberative political process could assure the equitable distribution of water and ultimately contribute to resolve the conflict. We call for the institutional mechanisms for upstream-downstream cooperation and inclusive decision-making practices towards better local water governance.

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