NEW ANGLE Nepal Journal of Social Science and Public Policy
December 2018, Vol. 5(1), pp. 30-46 [in Press]

Published by **NPRN**
Hosted by **SIAS**
Available at www.nepalpolicynet.com

WATER SECURITY IN URBAN WATER GOVERNANCE: A CASE STUDY OF DHULIKHEL MUNICIPALITY, KAVREPALANCHOWK, NEPAL

Kushal Pokharel[1], Tikeshwari Joshi[2], Jagannath Adhikari[3] & Kaustav Raj Neupane[2]

ABSTRACT

This paper locates the issue of water security within the larger discourse of Environmental Justice which has become more encompassing and broader in scope, forms and processes penetrating the issues of political, economic and cultural distribution of resources. The concept of urban governance and water security is inextricably tied as the need of improved water services historically grew with the expansion of cities calling for critical governance arrangements. In light of the above, this paper examines the existing state of water security in Dhulikhel. By examining the power relations between 'fringe' and the 'core' areas, the paper depicts the growing inequity across the 9 wards of Dhulikhel pertaining to water access and distribution based on caste, class, ethnicity and gender. Two fundamental questions that guide this paper are: 1) Why disparities exist between the core and fringe categories in Dhulikhel Municipality? 2) How does the core-fringe category shape the power of communities in the water governance? The findings clearly show that there is a huge discrimination between the core and the fringe, the poor and the non-poor within the core in water availability, distribution and decision making. Establishing an equitable

[1] Independent Social Science Researcher, Corresponding Author: kushalpokharel03@gmail.com
[2] Southasia Institute of Advanced Studies (SIAS), Kathmandu, Nepal
[3] Curtin University of Technology, Perth, Australia.

water justice system calls for uprooting the existing social discrimination in water security to empower the fringe communities.

Keywords: water security, core and fringe, Dhulikhel, environmental justice

INTRODUCTION

Universal notion of justice and equity has remained highly elusive although the movements for these goals are growing. Such concepts are deeply entrenched in the real needs and struggles of people and are often linked with the notion of sustainability *(*Agyeman, Bullard and Evans, 2002). Embedded in this idea is the principle of environmental justice, the use of which has become more encompassing that links marginalization with environmental services and is considered important for sustainable development. Instead of a universal use of the term, the concept of Environmental Justice (EJ) is increasingly applied in a contextualized way so that it is more relevant in helping to solve problems. The term 'environment' itself has become more comprehensive inclucating the access of environmental goods and resources-water, energy and greenspace and the natural as well as technologically produced risks (Walker et al., 2006; Adger et al., 2003; Pelling, 2005).

Within this larger discourse of EJ, issues relating to water security have greatly emerged. The history of water security is rooted in the notion of urban governance. With the expansion of the state and its services, demand for improved water system increased. The concept of water security emphasizes access to safe, affordable and clean water for every person to enable a healthy and productive life including the protection of the communities from water borne diseases and water-induced disasters (GWP, 2000). Asian Development Bank framework for national water security prioritizes the security needs of cities, environment, resilient communities and economies (AWDO, 2013).

While there is a plethora of literature on water security in agrarian contexts (Boelens et al., 1998), urban contexts (Bakker, 2001; Debanne and Keil, 2004), or at the regional level (Giordano and Wolf, 2001), limited studies related to the issues of equity and justice in peri-urban contexts are available (Allen et al., 2006; Edwards, 2002). Moreover, the question of how peri-urban transformation shapes water access and affects water justice remains an under-researched area.

Nepal is one of the rapidly urbanizing countries in Asia. According to the economic survey of 2015-16, 42 percent of the population in Nepal lives in urban areas (MOF, 2016). The problem of water insecurity in peri-urban fringe has become more critical not due to technical problems like burgeoning air pollution, falling

groundwater levels but more importantly by the process of socio-cultural and political marginalization. Access to piped water in urban areas declined from 68% to 58% from 2003 to 2010 as a result of growing social inequality and economic disparities manifested in inadequate service delivery and sustained increase in urban population (World Bank, 2013).

What is more concerning is the disproportionate impact of water scarcity in the urban society. Widespread poverty coupled by lack of access to productive resources have increased the vulnerabilities of the marginalized groups including women, children, old aged and differently abled people which often manifest in their inability to get access to water as a basic human need. Three issues are crucial in the context of assessing the water justice scenario in Nepal: fair distribution of benefits, burdens and risks related to water resource development; the recognition of diverse needs and values; their just representation in policy making arenas (Sen, 2009). The escalation of tensions between communities and states have manifested in the development of large-scale water infrastructures in Nepal (Gyawali, 2013). Moreover, Onta and Tamang (2013) discusses the water resource development characteristics in Nepal from the standpoint of under representation of the marginalized and disadvantaged groups in the project design and weak accountability structures.

In light of the above, this paper examines the existing state of water security in Dhulikhel municipality. By examining the power relations between 'fringe' and the 'core' area, we depict the growing inequity across the 9 wards of Dhulikhel in terms of water access and distribution. We use the term 'fringe' in the context of power relationships to refer to areas that are politically and physically marginal to an incorporated city. We also look into how the fringe is formed from historical marginalization within the 'core urban' and rural areas adjoining the urban, which later develops as urban fringe in the process of expansion.

We begin with problematizing the water justice system in our context followed by a section on the conceptual review of the wider discourses of water justice and equity under the notion of EJ. Two fundamental questions that guide this paper are: Why disparities exist between the core and fringe categories in Dhulikhel Municipality? and; How does the core-fringe category shape the power of the communities in water-based governance? In the next section, we present the empirical findings on the situation of water availability including management and distribution system, participation of various groups in the decision-making processes and further analyze the disproportionate access to and control over water resources in core and fringe communities.

THE JUSTICE CONUNDRUM

As the universal notion of justice has remained elusive in the absence of a unifying framework and conceptual clarity

(Ikeme, 2003), alternative interpretations of justice examining its moral and the ideological character have resulted in multiple perspectives within the practical and analytical contexts. While scholars emphasize the diversity in the theory of justice and rejects the possibility of a measurable and universal notion (Debbane and Keil, 2004), the theoretical contestation is rife with the issue of 'redistribution' vs 'recognition', the latter becoming more dominant demanding a differential treatment of the racial, ethnic and gendered identity (Fraser, 1996; Scholsberg, 2004). The principle of recognition takes into account the locally grounded dynamics of inequities across different scales- the term local not being confined to geographic space but more importantly signaling the multi-scalar interaction of institutions and processes (Debanne and Keil, 2004).

Transcending beyond its origin and initial framing in the US, the concept of environmental justice has become more encompassing and broader in scope in the sites, forms and processes of injustice. Beyond the national boundary, the environmental justice agenda delves into questions of distribution both between and across nation-states (Stephens et al., 2001; Newell, 2005), penetrating different political, cultural and economic environments (Ageyman et al., 2003). Within EJ, procedural and distributive justice have become debatable. Intrigued by the question of distribution in terms of varying political, cultural and economic environment, (Ageyman et. al., 2003), the distributive justice underpins the idea of 'justice to whom' encompassing the demographic and gendered differences along with the rights of the future generation (Dobson, 1998). Furthermore, the fairness of the processes in the distribution of environmental goods and services imply the equitable opportunities for individuals and communities to mitigate risks (Walker et al., 2005).

ENVIRONMENTAL JUSTICE AND WATER SECURITY

Building a strong and resilient water system is high on the international political agenda but lack of unanimously acceptable definition of water security remains pertinent. In an attempt to provide a more measurable and acceptable definition, Grey and Sadoff (2007) explain this concept as the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production coupled with an acceptable level of risks to people, environments and communities.

The role of EJ to promote water security has been widely acknowledged. Increasing popularity of water security in both policy and academic debates transcends beyond the ideals of quantity and availability of water to encompass the issues of water quality, human health and ecological concern security (Cook and Bakker, 2012). An integrative inter-disciplinary approach is

evolving with water governance at its core (Mirumachi, 2008).

Analyzing the water security condition under the framework of the core-fringe discourse assumes greater significance in the context of cities in developing countries. Fringe urbanization is a definitive characteristic of the metropolitan condition in global south. While there is broad agreement that the term "urban fringe" refers to an evolving zone of development beyond the city core, it is used to describe a wide range of socio-spatial phenomena (Thuo, 2013). Recognizing this diversity, the fringe spatially and relationally denotes areas that are physically and politically marginal to an incorporated city. However, there are growing criticisms of the geographical notion of the fringe and increasing focus on the institutional aspect; rural-urban linkages and characteristics, flow of goods and services (Iaquinta and Drescher, 2000). Closely allied with this is the process-based interpretation of the term denoting a transition from rural to urban area including the flows of labor, natural resources and agricultural products (Narain, 2007). With this definition, the power relationship between the fringe and the city is of greater significance than descriptive "rural" and "urban" or "agricultural" and "non- agricultural" characteristics. Existing literature also hint at the existence of 'fringe' within the core (Ranganathan and Balazs, 2015).

METHODOLOGY

This study made use of various data collection methods: Key informant interview (KII), interview with local people, Focus Group Discussion (FGD), local stakeholders' workshop and expert meeting to obtain deep insight into the dynamics of water management and distribution in Dhulikhel. Altogether, 18 KIIs were conducted under 5 different categories of respondents. 4 local leaders from the peripheral area of the Dhulikhel were interviewed to understand the political economy of water security. Similarly, 3 leaders from upstream areas actively involved in raising issues with the Dhulikhel drinking water user committee were also interrogated for this research.

Interviews with ex-officials of the Dhulikhel drinking water user committee who were also involved in forging an agreement with upstream community 25 years back were important to figure out their struggle during the establishment and management of water supply system. Finally, officials from Municipality and District Soil Conservation Office, representatives from Kathmandu University and Kavre Valley Integrated Drinking Water Supply Project were approached to find out the state of collaboration among different stakeholders, upstream-downstream relations regarding water security.

RESULT AND DISCUSSION

Evolution of Dhulikhel as an emerging town

Dhulikhel- a hilltop town struggling for water supply for over three decades is located at about 32 km east of Kathmandu, the capital city of Nepal. An integral part of the Kavre valley which comprises of Kavre, Panauti and Dhulikhel, the town is renowned for its stunning natural views and cultural sites. The town is also developing as a center for education and health after establishment of Kathmandu University and Dhulikhel Community Hospital.

The municipality has 16,263 populations living in 3,291 households with an average household size of 4.49. The sex ratio is 106.6 with male population 8,392 to female population 7,871 (CBS, 2012). Among the major caste and ethnic groups residing in the town are: Brahmin, Chhetri, Newar and Tamang. Among the two major factors contributing to the growing water insecurity in the town are: increasing population pressure and growing water demand of the villages integrated into the town.

Situated at 1550m above the mean sea level, Dhulikhel is dominated by rural and agricultural land (73.6%) followed by forest land (22.4%) and urban area covers only 4%. The municipality is surrounded by Kavre Village Development Committee (VDC) in the east, Panauti Municipality in the south, Ravi opi and Panchkhal VDCs in the north and Banepa Municipality in the west.

Compared to other municipalities in western and far western region of Nepal, Dhulikhel has relatively low poverty rate. According to the small area estimation of poverty 2011, the municipality's current poverty rate is 2.47% drastically decreasing from 13% in 2001 (CBS, 2012). The municipality falls among eight municipalities with poverty rate below 5% (NLSS, 2011). Having said that, there is an increasing disparity between those who own the means of production and those who don't that implicates the water availability and security of different socio-cultural and ethnic groups.

Emerging from a rural village to a municipal town was a bumpy ride for Dhulikhel. Once a district headquarter almost at the brink of extinction owing to water scarcity, Dhulikhel later became a vibrant town. Out of the need to get access to foreign funding, Dhulikhel incorporated the population of the adjoining rural areas to meet the basic requirement of municipality. The drinking water project that started in 1987 was completed after four years with the technical and financial assistance of the GTZ and formally handed over to the community in 1992. Pressurizing the government to declare the then village panchayat as municipality, the local communities wanted to meet the funding criteria.

In collaboration with Dhulikhel Development Board (DDB), GTZ worked for securing water needs of the town. The DDB made

agreement with upstream community for securing water source which lies in the upstream called Kalanti Bhumidanda VDC. As per the agreement Dhulikhel needed to support in construction of School building in lieu of their water source protection efforts. Finally, the DDB handed over the responsibility to Dhulikhel Drinking Water Supply and Sanitation Users Committee (DDWSSUC) in 1992.[4]

DDWSSUC formed in 1992 composed of elite people from the present ward 2-5 of the municipality. Those participating in this committee were politically active people from the past. Although it appears at present that the then Municipality also covered other parts of the city wards including ward no. 7, 8 and 9 and some parts of wards 1, and 6 of the municipality, from the very beginning, there was no participation of people from these areas in the original in the 1992 committee. This has resulted in the growing water marginalization in these areas with the elite control in the water security systems.

The Core-Fringe Dynamics

The historical root of the problem manifests even today across the different wards of the town. While wards 2-5 have proper access to water resources, the remaining wards lying under the 'urban fringe' are facing acute shortage of water. In this context, Wards 2-5 is considered here as the core and Wards 1, and 6-9 as fringe. Until now, the participation in people in Water User Committee is mainly from the core area. And so the water discrimination continues between core and periphery, showing the strong links to ethnicity and class. A brief description of the demographic composition of the core and fringe is presented below:

Core: 41 % of the population live in the core wards of Dhulikhel. The total number of household in this area is 794. There is a mixed social group with highest number of Newars (2953) followed by Chettris (996). Other ethnic groups include Tamang, Damai, Gurung, Thakali, Rai (CBS, 2012 and Municipality Profile, 2016).

Agriculture is the main occupation of the core population. Increasing interest on trade business and jobs among the young population can be observed. Compared to the fringe, the number of families engaged in wage labor is low i.e. 161. Also the share of remittance income is low which indicates that there is relatively less migration from this area in terms of opportunities.

Fringe: The 2011 national census reports a total of 2122 households have been in ward 1,6,7,8 and 9 of the municipality. Newars have the highest population even in the fringe followed by Tamangs, Chhetri and Brahmins. Among the reasons of migration from the fringe, search for work, better opportunities and good salary are

[4] Interview with DDWUC representative, 2014

the most prominent. A total of 500 people are illiterate. Particularly, the numbers are alarming in case of ward no 8 (223) and ward no 9 (153). This category consists of the relatively poor income families. Number of families earning less than 5000 per month in the fringe are 545 while in core it's only 218. There is an increasing trend of international labor migration in fringe than in core, 51 households to be more precise, only 30 from core.

Agriculture is the major livelihood options for the fringe. A total of 1123 households are engaged in agriculture for survival followed by wage labor i.e. 400 households. There is relatively less number of households in business and jobs from this area. Share of remittance income is also appearing as a strong means of livelihood in the poor fringe community**.**

Water Availability Scenario

92% of the Dhulikhel population is supplied with drinking water[5] from Saptakanya spring of Kharkhola which lies in Kalanti Bhumidanda Village Development Committee (VDC), southeast of Phulchoki Mountain. While the current demand of water is about 23 million litres, only 13.83 million of water is being supplied per day (Pandey, 2016). With only 48 % of households having direct connection to piped water, the problem of water access is acute in the city particularly affecting the poor and the vulnerable population. Based on the data of Dhulikhel Drinking Water User Committees, two categories of users exist: domestic and industrial users. The registered number of domestic users in Dhulikhel is 1892 whereas the industrial users stand at 94.

A huge difference in water access among the people living in the core city and the outer periphery is visible. Although geographical variations affect water availability in the region with elevated areas getting less water due to low water pressure in their taps, the powerful households even in difficult locations have access to advanced technology for controlling water pressure. Households in the marginal areas like ward no. 1 and 6 have no access to Dhulikhel Drinking Water Supply System primarily due to the discriminatory water policies formulated by a handful of people living in the core areas. One of the local inhabitants during an interaction with the research team expressed his dissatisfaction over the government's consideration of wards 2-5 as real Dhulikhel and supplying water only to these areas.

While wards in Block A (core area) gets water in two different time slots for 7 hrs in a day, the situation is different for Blocks B and C primarily comprising of the fringe areas (see Table 1). Fringe area gets water only for 4 hours a day. Such discriminatory provisions resonate the question of who determines

[5] Interview with DDWUC representative, 2014

the water accessibility with what motives and incentives. Despite the capacity to supply drinking water to these wards, the water supply system is least bothered about catering their needs. Moreover, there is no provision of subsidies in connection charge for low income people in Dhulikhel

Majority of the poor living in Dhulikhel meet their daily needs by wage labor. These people live in areas that can be called 'fringe within the core'. Residing in the central part of the city in rented house, they have limited access to the piped water under the control of the house owner who charges 50% of the total monthly water tariff of the house.

Table 1: Water Availability Discrepancy in Three Blocks (Core vs Fringe)

Block	Timeslot	Hours
A (ward 2-5)	5-9 A.M. 5-8 P.M.	7 hrs
B (ward 6-9)	6-7 A.M. 1-4 P.M.	4 hrs
C (ward 1)	4.30-6 A.M. 3.30- 6 P.M.	4 hrs

Source: Field Survey, 2014

People in the fringe have to either spend a lot of money or time to get water which adversely affects their livelihood. Ward no.1 is the most vulnerable compared to other wards in the absence of their own water sources. One of the local farmers representing this ward informed that his community has to travel to the neighboring Kavre village to fetch water which takes approximately one and half hour to reach on foot. A local peasant from ward no.6 said that he has to buy 3 tankers (5000 liter/tanker) per month incurring the cost of Rs 1800/tanker. Water has become an expensive good in the town inspite of the government's commitment to protect it as a common property resource.

On an average, core area was found to have disproportionately high access to water than the fringe. Discrimination within the core was equally pertinent relating more to economic marginalization and gender status of the household head. One of the respondents from ward no. 3 (core area) who didn't have piped connection remarked that owing to the joint ownership of the house, she did not have her own piped water supply. She shares water from other household and equally contributes to the monthly charge. Another respondent from ward no. 2 who could not speak very well in conversation with us shared that she uses the nearby public tap and during the monsoon gets bad quality water mixed with flood. During monsoon she normally goes to neighboring household with access to piped water. These women are the head of the families and have often been subjected to various socio-economic discrimination by their own close relatives in matters not only related to property but also water.

Water Consumption Patterns

Water sources vary according to wards (See Table 2). While piped water is a major source of water, other prominent sources include wells and stone taps particularly in the fringe areas. The core areas have no well and tube well but only 2 stone taps.

Because of longer duration and more flow, there is high level of water availability in the wards 2-5. There is a growing evidence of the variation in water consumption across

Table 2: Sources of Water

S. N.	Water Source	Ward No.									Total households
		1	2	3	4	5	6	7	8	9	
1	Pipe Supply	254	128	128	112	138	343	310	124	78	1577
2	Well	21	-	-	-	-	43	53	-	-	117
3	Tube Well	6	-	-	-	-	-	-	-	-	2
4	Stone Tap	6	-	-	1	1	5	57	15	20	105
5	River/Stream	-	-	-	-	-	3	-	-	-	9
6	Total	289	128	128	113	139	394	420	139	98	1848

Source: Field Survey, 2014

Table 3: Patterns of Water Consumption (Unit wise)

S. N.	Water Use in Unit	Ward No.									Total
		1	2	3	4	5	6	7	8	9	
1	0-10	78	65	94	81	97	83	170	40	73	781
2	>10-25	40	118	115	65	83	68	235	31	44	799
3	>25-50	10	32	56	14	32	42	61	1	2	250
4	>50	4	17	19	0	19	32	19	0	0	110
Total		132	232	284	160	231	225	485	72	119	1940
Percentage Consumption (Ward wise)		6.8	11.9	14.6	8.2	11.9	11.5	25	3.7	6.1	100

Source: Field Survey, 2014

the 9 wards of Dhulikhel (see table 3). Of the total water use, the core (Ward 2-5) consumes 46.6%, wards 7-9 also referred to as powerful within the core area uses 39.8 %. However, there is only 14% of water consumption in the fringe (ward 1).

The core-fringe divide

Growing disparity in information pertaining to water access and quality of service has further entrenched the core-fringe divide in Dhulikhel. One farmer from ward no 7, who is neither a user of Dhulikhel drinking water supply system nor has his own water supply system relies on the public well near his house. He is working on a crop sharing basis. Majority of the farmers in the area are not well informed about water services provided by Dhulikhel water users committee and unaware of the water quality in the absence of a vibrant local government.

The empirical data presented in different tables shows that those who have power and control over the water security systems (core area) consume the highest percentage of water. On the contrary, in the absence of political networks leading to underrepresentation in the decision-making structures, some areas consume less water. Ward no 1 (fringe) consumes only 6.8 percent of the total.

Discriminatory Water System

While the people having access to Dhulikhel Water Supply System were fully satisfied with water facilities, people living at remote geographical regions of the ward no. 1 and 6 – the fringe area who are not the users of the system expressed their utter dismay over the existing discrimination in water supply systems. Further expressing their concern towards ongoing ADB funded project named Kavre Valley Integrated Drinking Water Supply Project that aims to make the reservoir tank in low land thereby isolating the upstream communities from the access of piped water, the inhabitants of the fringe have become highly critical.

The key informant belonging to water users' committee claimed that since the beginning of its establishment, it has been successful in equitable distribution of quality water to its users – in both in terms of amount of water and the price.

The above description makes it clear that there is no equitable distribution of water. In terms of price too, this is not equitable. The pricing system puts more burden on poor and those who consume less. Monthly charge is determined as per the water use ranging from less than 10 units to greater than 51 units. Those who use less than 10 units have to pay NRs 160/month. As the minimum unit exceeds, the users should pay on per additional unit basis.

Upon interrogating the need of subsidies for the people who cannot afford, majority

Table 4: Water tariff trend of DDWUC

Consumed Units	Rate of water tariff in NRs						
	1990/91	2001/02	2006/07	2010/11	2011/12	2012/13	2014/15
<10	35/month	50/month	60/month	75/month	105/month	125/month	160/month
11-25		6.0/unit	6.5/unit	10	14/unit	17/unit	22/unit
26-50		9/unit	10/unit	15	21/unit	25/unit	33/unit
>51		20/unit	22/unit	34	48/unit	58/unit	76/unit

Source: Field Survey, 2014

of the respondents opined that granting subsidies with the assurance of no misuse could be highly useful for the poor households. Moreover, from the equity perspective, identification and ranking of the poor is another challenge.

Two distinct types of poor live in Dhulikhel; seasonal migrants in rented house and the permanent poor. The first type of the poor is those who meet their livelihoods by wage labor living in the rented house, get the supplied piped water through the house owner, but have to share the monthly charge of water with house owner in an equal basis (Field interview, 2014 and authors own site observation).

Social Discrimination in Water Use

The claim of the DDWUC officials that the poor and disadvantaged groups lacking access to the piped water system have immensely benefitted from the public taps is devoid of substantial ground evidence. While the officials asserted that people are getting drinking water free of cost, they didn't bother talking about the water quality. Our research shows that the quality of public tap water is a matter of grave concern. Sometimes the public taps are used by the private tap holders, mainly for washing clothes, bathing, irrigating home garden. Often, conflict ensues between Dalits and non-Dalits over the use of public tap water. The so-called upper caste people still are reluctant to fetch water together with Dalit labeling the later as untouchable (Field interview, 2014).

Since the water supply was originally meant for the core inhabitants of the village panchayat which now constitutes the Newar dominated wards, a clear gap between Newars and non-Newars community was observed during the study. While the Newars with a rich historical legacy enjoy political authority in urban areas where they also control the economy through business and enterprises, the fringe area consists of

diverse settlements with poor population having limited political control.

Discrimination is rife within the caste and ethnic groups including women. Generally, the women belonging to both castes: upper caste and Dalits are the victims of such events as women of both castes have to fetch water from such public taps. Women from poorer upper caste households and all women from Dalit families face problem in accessing water – though in different way. Based on our observation, we found that some people who have no access to Dhulikhel water supply system, usually rely on the traditional sources of water such as stone taps.

Most of the key informants shared that the users of the public taps constructed in the core town (2, 3, 4, 5 ward) of Dhulikhel are the poor and disadvantaged people who cannot pay the installation charge. The installation charge to connect private tap is NRs 8000 including a deposit of Rs 3250, Rs 2000 as meter charge and connection charge- Rs 2600 and an application fee of 150). The minimum monthly water tariff of Dhulikhel Drinking Water Supply is NRs 160/ 10,000 L.

Decision Making Structures and Processes

The GTZ supported water project created a deep faction between the core and periphery wards of Dhulikhel over the issue of distribution. While the periphery communities argued for the just distribution of water in all parts of the municipality, the core people denied. Regarded as one of the oldest systems managed by the user committees, the DDWUC is currently supplying water to around 10000 populations. While the water is distributed partially in ward 1,6, and 7, there is an adequate supply in the core areas. And extension is ongoing in ward 8 and 9 for the distribution.

Since the beginning of the Dhulikhel Drinking Water Project, there is virtually no representation of the vulnerable social groups in the water user committees exacerbating conflict between the users and non-users of the drinking water within the municipality. The participation of the users in the general assembly meeting of users committee indicate the state of decision making. Most of the local people interviewed during the research stated that they usually take part in the general assembly meeting held once in a year. And most of the respondents expressed that there are limited opportunities for them to express their voices which result in the feeling of being boycotted from the decision-making process. These people just participate, hear the decision of the users committee and express consent.

The supply of drinking water primarily to the core areas citing the technical difficulties to extend the service to the fringe is devoid of the social reality. Out of the fear of water

shortage, the powerful individuals in core are reluctant to provide water.

Another dimension of conflict is in terms of poor and better off within the core. Use of the public taps from the rich families have often resulted in low access to the tap for the socially and ethnically marginalized groups like Dalits.

The constitution of Dhulikhel Drinking Water Users' Committee has a provision of six female members (1Vice Chair and 5 Members) out of 21 in the executive committee (DDWUC annual progress report, 2013). According to the vice chair of the DDWUC, she was elected from three women counterparts and rest five women members were elected from17 women counterparts. Having said that, social disparity is evident in terms of women participation as these six women members belong to core areas of Dhulikhel.

Some exceptions are prevalent in the role of women. Referring to an incident in which women played a crucial role to collect installation charge for private tap connection in the beginning when some of their male counterparts demanded free water, the local official asserted that improved status of women participation in decision but failed to take into account the burgeoning divide between the women of the core and the fringe areas.

CONCLUSION

This paper reveals a contrasting state of water access in two spatially and socially differentiated areas of Dhulikhel. Growing disparity between 'core' and 'fringe' is deep rooted in the political access and power in water based decision making in the community. With the historical process of marginalization based on caste, class, gender and ethnicity still remaining, the problem of water security has become acute in the fringe areas. In the absence of deliberative public spaces, there is high handedness of core elites in the water management system which manifest in the inequitable water access, discriminatory water tarriff and uneven water consumption pattern. Consequently, social tensions have intensified between the core and the fringe, poor and the non-poor within the core.

We highlight the need for a more equitable water management systems that can address the problems of water security of the fringe areas which are populated by mostly the impoverished population. Improving deliberative spaces for the poor people in the water users committee to accommodate the voices of the socio-economically marginalized and disadvantaged groups will be a stepping stone in this direction.

REFERENCES

Adger, N., Huq, S., Brown, K., Conway, D. and Hulme, M., 2003. Adaptation to climate change in the developing world. *Progress in Development Studies*, 3(3), pp.179-195.

Agyeman, J., Bullard, R.D and, Evans, B., 2002. Exploring the nexus: bringing together sustainability, environmental justice and equity. *Space and Polity,* 6(1), pp.70–90.

Agyeman, J., Bullard, R.D. and Evans, B., 2003. *Just sustainabilities: development in an unequal world*, Earthscan, London.

Allen, A., Davila, J.D. and Hofmann, P., 2006. *Governance of water and sanitation for the peri-urban poor: a framework for understanding and action in metropolitan regions*. London: Development Planning Unit, UCL.

Annual Report, 2014. Dhulikhel Drinking Water Supply and Sanitation Users' Committee.

AWDO, 2013. *Asian Water Development Outlook: measuring water security in Asia and the Pacific*. ADB, Manila.

Bakker, K., 2001. Paying for water: water pricing and equity in England Wales. *Transactions of the Institute of British Geographer*, 26(2), pp.143–164.

Boelens, R., Davila, G. and Menchu, R., eds., 1998. *Searching for equity: Conceptions of justice and equity in peasant irrigation*. Assen, The Netherlands: Van Gorcum.

Central Bureau of Statistics (CBS), 2012. *National population and housing census 2011*. Kathmandu, Government of Nepal.

Cook, C. and Bakker, K., 2012. Water security: Debating an emerging paradigm. *Global environmental change*, 22(1), pp.94-102.

Debanne, A.M. & Keil, R., 2004. Multiple disconnections: environmental justice and urban water in Canada and South Africa. *Space and Polity*, (2), pp.209–225.

Dobson, A., 1998. *Justice and the environment: conceptions of environmental sustainability and dimensions of social justice*, Oxford University Press, Oxford.

Edwards P., 2002. *Institutional assessment: Reviewing policies, processes and stakeholder positions at the Kolkata peri-urban Interface*. Bangkok, Thailand: Asian Institute of Technology. Working Paper 3.

Giordano, M.A. & Wolf, A.T., 2001. Incorporating equity into international water agreements.

Social Justice Research, 14 (4), pp.349–362.

Grey, D. and Sadoff, C.W., 2007. Sink or swim? Water security for growth and development. *Water Policy*, 9(6), pp.545-571.

GWP, 2000. *Towards water security: A framework for action*. Global Water Partnership, Stockholm.

Fraser, N., 1996. *Social justice in the age of identity politics: redistribution, recognition, and participation*. The Tanner Lectures on human values, Delivered at Stanford University April 30–May 2, 1996.

Gyawali, D., 2013. Reflecting on the chasm between water punditry and water politics. *Water Alternatives*, 6(2), pp.177-194.

Ikeme, J., 2003. Equity, environmental justice and sustainability: incomplete approaches to climate change politics, *Global Environmental Change*, 13, pp.195-206.

Iaquinta, D.L. and Drescher, A.W., 2000. *Defining peri-urban: understanding rural-urban linkages and their connection to institutional contexts*. Paper presented at the Tenth World Congress of the International Rural Sociology Association, August1, 2000. Rio de Janeiro: International Rural Sociology Association.

Malini Ranganathan, M. and Balazrs, C., 2015. Water marginalization at the urban fringe: environmental justice and urban political ecology across the North–South divide, *Urban Geography*, 36(3), pp.403-423, DOI: 10.1080/02723638.2015.1005414

Mirumachi, N., 2008. Domestic issues in developing international waters in Lesotho: ensuring water security amidst political instability. In: N.I. Pachova, M. Nakayama & L. Jansky, eds. *International Water Security: Domestic Threats and Opportunities*. United Nations University Press, Tokyo; New York, pp.35–60.

MOF, 2016. *Economic survey 2016-17*. Ministry of Finance, Singhadurbar, Kathmandu, Nepal.

Municipal Profile of Dhulikhel Municipality, 2013, Dhulikhel Municipality.

Narain, V., 2007. Between rural and urban: policy in practice for the peri-urban interface. Paper presented at the *Second Annual Conference on Public Policy and Management*, April 12-14, 2007. Bangalore: Indian Institute of Management, p.24.

Nepal Living Standard Survey (NLSS), 2011. Central Bureau of Statistics, Kathmandu, Government of Nepal.

Newell, P., 2005. Race, class and the global politics of environmental inequality. *Global Environmental Politics*, 5(3), pp.70-94.

Onta, P. and Tamang, S., 2013. Nepal. In: A. Guneratne & A.M. Weiss, eds.. *Pathways to power: the domestic politics of South Asia*. Lanham, Maryland: Rowman & Littlefield, pp.283-344.

Pandey, C., 2016. Looming Water Crisis. *New Spotlight News Magazine*, [online] Available at: <http://www.spotlightnepal.com/News/Article/Looming-Water-Crisis-Nepal>

Pelling, M., 2005. *The vulnerability of cities: natural disasters and social resilience*, Earthscan, London.

Schlosberg, D., 2004. Reconceiving environmental justice: global movements and political theories. *Environmental Politics*, 13(3), pp.517–540.

Sen, A.K., 2009. *The idea of justice*. Allen Lane & Harvard University Press.

Stephens, C., Bullock, S., Scott, A., 2001. *Environmental justice: rights and mean to a healthy environment for all*. Special Briefing Paper 7, ESRC Global Environmental Change Programme.

Thuo, A.D.M., 2013. Unsettled settled spaces: searching for a theoretical 'home' for rural-urban fringes. *International Journal of Scientific and Research Publications*.

Walker, G. P., Fay, H. and Mitchell, G., 2005. *Environmental justice impact assessment: an evaluation of requirements and tools for distributional analysis*, a report for Friends of the Earth England and Wales, FoE, London.

World Bank, 2013. *Nepal bigger strides in post-conflict poverty reduction poverty diagnostics*, 2010- 11.