A STUDY OF SOCIAL SUSTAINABILITY AND URBAN WATER SUPPLY SYSTEMS IN SHILLONG

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DECLARATION

I hereby declare that the thesis entitled "**A Study of Social Sustainability and Urban Water Supply Systems in Shillong**" is the result of research work carried out by me at the Department of Humanities and Social Sciences of Indian Institute of Technology Guwahati, under the supervision of Dr. Ngamjahao Kipgen. The present thesis or any part thereof has not been submitted in whole or in part to any other university/institution for the award of any degree or diploma.

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CERTIFICATE

This is to certify that the thesis entitled "**A Study of Social Sustainability and Urban Water Supply Systems in Shillong**" submitted by Bankerlang Kharmylliem, Roll Number – 136141012, for the award of degree of Doctor of Philosophy in the Department of Humanities and Social Sciences of Indian Institute of Technology Guwahati, embody bonafide record of research work carried out under my supervision. It is the result of his investigation and has not been submitted either in whole or in part to any other university/institution for a research degree.

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July 2018

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Abstract

This study is concerned with social aspects of sustainable development. It attempts to understand social sustainability by examining the water supply systems in Shillong, the capital city of Meghalaya. The focus is on 'water equity' in terms of domestic water access and supply, and 'water governance' practiced by the traditional institutions.

The city of Shillong is a comparatively small city in the Northeastern part of India. Like most cities in India and in other developing countries, one of the foremost challenges is to ensure a safe, reliable, affordable, and easily accessible water supply to its urban residents.

The current system of water supply in Shillong has failed in various fronts. There is inequity in access to water and the current water supply situation is insufficient even to those having piped water supply. Most of the poor are excluded from the water network and those with piped connections still get insufficient and irregular water. Households who do not receive water encounter costs in getting water from other sources. The dependence on the many sources of water (both 'improved' and 'unimproved') reveal the quality of water services and water governance.

In some localities the water supply is twenty four hours daily whereas in some it is less than thirty minutes in a day. There are many differences in water supply and access between the municipal and the non-municipal areas. Also, there are notable differences among localities of the same area, i.e., either the municipality localities or the non-municipality localities. For example, water supply in these two areas is not homogeneous. Households within the municipal area get more water which is more regular and of better quality than those outside the municipal area. In the municipal

area most have piped water on premises. Outside the municipal area there is piped water supply provided by the PHED mainly through local sources of water. Public standpipes are also an important means to get water. Other sources that people depend on are wells, tube wells, tanker trucks and springs. The study gives a broad view of the current water (in)equity condition and position of Shillong.

This study also explores the traditional institutions of the *dorbar shnongs* operating in the urban setting in the context of domestic water distribution. The nature of water governance carried out by these institutions is examined to understand their role and contribution to water governance in the city. Comparisons are drawn to highlight the practices that are directly and indirectly contributing to water supply and how as a part of the hydrosocial cycle, these institutions affect the outcome. The study closely examined three localities in the municipality area and four localities in the non-municipality area. Of the many significant findings, one shows that closely knit communities, through the traditional institutions, can successfully distribute water and look after and protect water sources. The *dorbar shnongs* play a vital role in the augmenting water supply in some localities in the city. Water creates interdependencies among the actors. But this is weakened by modern mechanisms of government and urbanization itself.

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List of Abbreviations

Abbreviation	Full Form
ADC	Autonomous District Council
AusAID	Australian Agency for International Development
BSUP	Basic Service of Urban Poor
GSWSP	Greater Shillong Water Supply Project
GSWSS	Greater Shillong Water Supply Scheme
IRC	International Water and Sanitation Center
JMP	Joint Monitoring Programme
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
KHADC	Khasi Hills Autonomous District Council
LPCD/lpcd	Litres per capita daily
MBDA	Meghalaya Basin Development Authority
MDC	Member of District Council
MDG	Millennium Development Goal
MLA	Member of Legislative Assembly
MLD/mld	Million litre per day
MoUD	Ministry of Urban Development
MUDA	Meghalaya Urban Development Authority
NOC	No objection certificate

PDS	Public Distribution System
PHED	Public Health and Engineering Department
SDG	Sustainable Development Goal
SMB	Shillong Municipal Board
SUA	Shillong Urban Agglomeration
ST	Schedule Tribe
UFW	Unaccounted for water
UKJHADC	United Khasi-Jaintia Hill Autonomous District Council
UNDP	United Nations Development Programme
UNDSD	United Nations Division for Sustainable Development
UNESCAP and the	United Nations Economic and Social Commission for Asia Pacific
UNESCO Organization	United Nations Educational, Scientific and Cultural
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

Glossary Terms (Khasi to English)

Adong	:	rules
Bakhraw	:	council of elders
Basan	:	elder
Dong	:	sub-locality, division
Dorbar	:	council
Dorbar pyllun	:	small council of a number of villages or localities
Dorbar shnong	:	Khasi local traditional informal institution
Hima	:	state
Hima pyllun	:	full state
Hynniewtrep-hynniewskum	:	seven huts seven nests
Kamai ia ka hok	:	integrity, a disciplined sense of righteousness that has to be maintained
Khlaw	:	forest
Khrud	:	to scrape, erode
Khyndai	:	nine
Ki tymmen ki san	:	elders
Ksiar	:	gold
Kur	:	clan
Kynthei	:	women
Laiphew	:	thirty
Lyer	:	air, wind
Lyngdoh	:	priest

Mariang	:	nature
Mei Ramew	:	mother earth
Niam Khasi	:	Khasi traditional religion
Pynkhuid shnong	:	cleaning of the village or locality
Pyrkhat	:	think, thought
Rah	:	carry
Raid	:	commune or province
Rangbah Shnong	:	headman
Ri Raid	:	community land
Ri Kynti	:	private land
Samla	:	youth
Seng	:	organization
Shnong	:	village or locality
Sirdar		
Sngi	:	the sun
Syiem	:	ruler (king or queen) or chief
Synjuk	:	federation
Tip briew tip blei	:	to know one's neighbours/fellow human being and to know God
Tymmen shnong	:	elders of a village or locality
Um	:	water
Umdih-umtong	:	drinking water
Umjer	:	dewdrops

CHAPTER 1

INTRODUCTION

The battle for a more sustainable future will be won or lost in cities.

- Manifesto for Cities, 2012

1.1 Introduction

The earth appears from space as a blue planet which is a vivid sign of water's ubiquity. Most of the water is found in the oceans. Fresh liquid and atmospheric water, which sustains terrestrial life, constitutes less than one per cent of our water stock. It is a small and fragile part of our water cycle within a much larger system (Grey et al., 2013). One of the wonders of the earth is the pristine waters that give life to ecosystems and human societies (Dargantes et al., 2012). Flowing water, emerging from the depths of the earth, symbolizes its virginity, its purity and its freshness (Euzen and Morehouse, 2011).

Water is essential for sustaining life, development and the environment (Mehta, 2000). Availability of water is a key determinant of social prosperity (Rasul and Chowdhury, 2010); however, vast populations still lack access to water and continue to be victims of poor water provisioning. Water is increasingly seen as a scarce natural resource (Mehta, 2000) which cannot be replaced (Mega, 2010). But there is a substantial quantity of fresh water available in the world, which goes much beyond current or projected use levels (Gandhi and Namboodiri, 2009).

Water scarcity is often presented in absolute and monolithic terms which are not right. It is linked with ecological, socio-political, temporal and anthropogenic dimensions. There is tremendous inequality to access and control over water resources

and is related to the distributional and relational aspects of scarcity (Mehta, 2000). Decisions taken today in cities across the world will shape not only their own destinies but also the social and environmental future of humankind (World Urban Campaign and UN-Habitat, 2012).

The Millennium Development Goals (MDGs) have been succeeded by the Sustainable Development Goals (SDGs). Goal 6 of the SDGs envisages of ensuring access to water and sanitation to all. Two of its main targets are to achieve universal and equitable access to safe and affordable drinking water for all and to substantially reduce the number of people suffering from water scarcity by 2030 (UN, 2015).

Water is the most familiar and the most important substance in our lives (Fishman, 2011). Water is not just a natural resource but a social good (Tvedt, 2015). According to Linton (2010), water and people are involved in the business of making each other. Water and society are deeply interwoven. Water runs in society and becomes socialized (Tvedt, 2015). Water "has a multiplicity of cultural, social, symbolic, discursive, imaginative and ideational meanings, values and practices coupled with it, which exist in complex ways alongside, and intermingle with, its basic material qualities as something that is essential for life" (Fontein, 2008, p. 743). Societies' and people's ideas of water have been developed and formed in relation to a broad range of issues (Tvedt, 2015). For instance, water is given meaning through cultural beliefs, historical memory, and social practice, and exists as much in discourse and symbolism as it does as a physical, material thing (Perreault, 2014).

Water is inextricably bound up in all life (Whiteley, Ingram and Perry, 2008). As a resource, it circulates through the hydrosocial cycle (Bakker, 2002). Water lubricates social functions and life itself (Perreault, 2014). The influences which city exert on social life is great (Wirth, 1938). Since the very origins of the city there have been concerns

over how to maintain its social life. It is therefore unsurprising that there remain concerns over the sustainability of urban societies (Davidson, 2010).

The 21stcentury will not be just an urban century but also an Asian century with much of the urbanisation taking place in Asian cities, especially in India and China (Saxena and Vijayakumar, 2014). The growth of cities marks the beginning of what can be called modern in our civilization. One of the challenges associated with the magnitude of urban change will be to supply water to urban areas (Srinivasan, Seto, Emerson and Gorelick, 2013), as many urban centers will be unable to expand supply to meet the demand because of poor governance or inadequate co-ordination among relevant agencies (Vo, 2007).

Consequently water is one of the biggest crises that are faced in Urban India where there is more demand than supply. As city grows and towns' sprouts adequate policy measures regarding water are not given its due priority, this has resulted to emerging water problem. With the process of urbanisation the traditional system of managing water resources are often dismantled, the problem of mismanagement and wastage of water during collection, distribution and delivery of water is rampant.

1.2 Background to the Study

Most cities in India are facing a form of water crisis, be it related to water resource scarcity or water access (Zérah, Janakarajan and Llorente, 2011). The biggest concern is that most cities do not provide the requisite amount of water: cities on an average receive only 69 litres per capita day (lpcd), as opposed to the norm of 135 lpcd (Wankhade, Balakrishnan, and Vishnu, 2014). The failure to provide safe drinking water and adequate sanitation services to all people is perhaps the greatest development failure of the twentieth century (IWMI, 2007).

In rapidly urbanizing areas, the limited availability of clean water supplies leads to widespread concerns over water quality and access (Bakker, 2003a). In India, growing population and rapid urbanization is putting a strain on water supply systems in urban areas (Gottipati and Nanduri, 2014). Like most countries of the world, domestic water supply in India is heavily subsidized which causes water to be overused (Biswas and Tortajada, 2010a). As a large section of the population will not have the financial capacity to pay for water, the government will have to subsidize the water harvesting, processing, and distribution costs, possibly at the expense of other equally important public needs (Ray, 2008). Thus low efficiency and low cost provision reinforce each other (Jha, 2010).

Almost 74 per cent of urban population in India has access to formal piped water supply system (World Bank, 2006). However, the term coverage only indicates the reach of the public water supply system but does not indicate the quantity, quality and duration of supply to the covered population. It is estimated that people in Indian cities that are connected to a piped system, on an average, receive less than three hours of water service per day (Bassi and Kumar, 2012).

India's utilisable freshwater resources are unevenly spread both seasonally and topographically (Grönwall, 2008). In 2003, India currently withdraws a little more than 26 per cent of available freshwater resources (Ray, 2008). India's cities depend most commonly on a mix of ground and surface water. Increasingly, urban areas draw water from great distances. Cities are excessively dependent on groundwater (Wankhade, Balakrishnan and Vishnu, 2014). 97 per cent of urban India has access to improved sources of water in the year 2015 (UNESCAP, 2015). Up to 48 per cent of the urban population in India uses groundwater (Koshy, 2016).

According to Census 2011, about 62 per cent of urban households in India have access to treated tap water (mostly piped water), 9 per cent to untreated tap water, 66 per cent to wells, 12 per cent to hand-pumps and 9 per cent to tube-wells. Even though Indian cities currently do not have universal access to potable water, the more pertinent issues are insufficient and unreliable supplies (MoUD, 2010).

Most cities in India are facing a form of water crisis, be it related to water resource scarcity or water access. Problems and concerns pertain to quantity and quality, equity across different sections of the population, ineffective and obsolete wastewater management practices and lack of long-term vision, planning and motivation (Zérah, Janakarajan and Llorente, 2011).

Institutional factors are a major reason for water supply conditions in India. In a weak institutional setting, for example in the absence of secure land tenure, it may be difficult to obtain the necessary permits to build infrastructure. Also, expanding the water distribution network poses distinct technical difficulties. In most cities, a networked water supply system exists but covers only a proportion of the city (Bakker, 2003a). Scarcity in the Indian urban cities and towns is a mostly man-made phenomenon that is conducive to the flaring-up of localized conflicts (Zérah, Janakarajan and Llorente, 2011). Skewed availability of water between different regions and different people in the same region and also the intermittent and unreliable water supply system has the potential of causing social unrest (National Water Policy, 2012). Adding to this, though regulatory power lies with individual state governments, very few, if any, have passed laws and implemented them.

Consequently, sustainability is neglected and equity questions are flouted (Ray, 2008). The reinforced top-heavy urban hierarchy also aggravates inequities in service delivery. In terms of water service, this leads to problems such as reliance on untreated

groundwater, the critical role of which in the process of urban development is given very little attention (Janakarajan, 2004) and the withering of the current model of governance (Zérah, Janakarajan and Llorente, 2011).

The per-capita availability of water in India as a whole has been assessed as 1,720 cubic metres (m^3) per year in 2007. By international norms, a country with water availability less than 1,700 m^3 is categorised as 'water-stressed', whereas less than 1,000 m^3 makes it 'water-scarce' (Grönwall, 2008). According to the WHO (2010), good achievements can be attributed to urban water supply in India but population growth is adding to the challenge. Drinking water for this growing population poses considerable demands (81,000 MLD) on India's dwindling water resources (MoUD, 2010). The National Water Policy (2012) tells us that natural water bodies in India are being encroached upon, and diverted for other purposes. Groundwater recharge zones are often blocked. Groundwater, though part of hydrological cycle and a community resource, is still perceived as an individual property and is exploited inequitably and without any consideration to its sustainability leading to its over-exploitation in several areas. India has a market where private water vendors sell freshwater (groundwater) which supplements the public-service providers in cities (Grönwall, 2008).

Table 1.1: Drinking Water Sources in Urban India

India	**Drinking water coverage estimate**	
	Urban (%)	
	1990	**2015**
Pipes onto premises	47	54
Other improved source	42	43
Other unimproved source	10	3
Surface Water	1	0

Source: **WHO/UNICEF JMP, 2015**

At national level, main drinking water source is tap water (44 per cent of total households), followed by hand-pump/tubewell/borewell water (42 per cent of total households). In Northeast region of India, only 21 per cent of households have access to piped water. Main drinking water source in the region is hand pump/tube well (45 per cent of total households). The region is seriously lagging behind in terms of water supply infrastructure development as well as proper operations and maintenance of existing infrastructure. In the region, 47 per cent of total households have a water source within premises, 31 per cent have it near premises and 22 per cent have it away from premises, while national numbers are 47 per cent households have a water source within premises, 36 per cent have it near premises, and 18 per cent have it away from premises. One more important difference is in terms of using other water sources than the main sources of tap water, well water and tube well/borehole water which includes water from lake/pond, springs, river/canals, etc. Only 4 per cent of households on the country use these other sources, but in Northeast the number goes up to 15 per cent. Meghalaya has the second highest number of urban households (about 68 per cent) using treated tap water in North East India after Sikkim (70 per cent). The dependence of households on tubewells/borewells is low when compared to other states like Assam, Nagaland and Tripura. Other sources of water in urban Meghlaya include untreated tap water (about 10 per cent), covered and uncovered wells, borewells and other sources (India Water Portal, 2015).

The Northeast region is endowed with an enormous water resources potential that accounts for about 34 per cent of the country's total water wealth and about 37 per cent of its total hydropower potential although the region represents only 7.9 per cent of the total Indian landmass. The per capita and per hectare availability of water in

this region is the highest in the country. However, less than 5 per cent of the existing potential of the region has so far been tapped for societal use (Goswami, 2005).

Despite high rainfall, many areas in Meghalaya face water shortage. Shillong, the capital city of Meghalaya in recent years have experience water scarcity with the onslaught of rapid urbanization. The city is highly congested area where much of the land is under settlements and roads. Deforestation in this zone is having detrimental effect on the water supply of the Shillong Urban Agglomeration (SUA). Water demand is rising whereas supply is declining possibly due to climate change, land use changes, groundwater exploitation, pollution of both surface and ground water, and degradation of catchment areas mainly through deforestation (Shabong, 2015). The growing population in Shillong puts pressure on the natural resources. With the rapid growth of urbanization, Shillong now faces shortage of water.

Sources of water supply in Meghalaya state are generally rivers, lakes, springs, natural falls and streams.[1] The water from these sources are fed directly in the piped distribution system and stored in tanks where it is distributed to the consumers through piped water supply (Gupta, 2003). Like other urban centers of India Shillong faces similar problems in regards to water distribution. Most hilly urban areas like Shillong face acute problem of water supply during the dry season. This is because the water supply in most hill towns is by and large governed by seasonal rainfall. The annual availability of surface water in Meghalaya is roughly estimated at 63.204 billion cubic metres and the estimated replenishable ground water resources are 1.15 billion cubic metres.[2]

[1] The discharge of water from these sources has reduced considerably in recent years as a result of massive deforestation and stone and sand quarrying in the water catchment areas.
[2] Meghalaya State Water Policy 2013 (draft).

This study is concerned with social aspects of sustainable development. It attempts to understand social sustainability and its two elements 'equity' and 'governance' by examining the water supply in urban areas. The focus is water equity in terms of domestic water distribution and accessibility and water governance in the city of Shillong. I will detail the current state (demand and supply) of water in Shillong in chapter 2. This study also explores the traditional institutions of the *dorbar shnongs* operating in the urban setting in the context of domestic water distribution in Shillong, Meghalaya. The nature of water governance carried out by these institutions is examined to understand their role and contribution to water (in)equity in the city.

In the following sections, relevant scholarly works and empirical studies have been drawn from existing literatures. The theoretical framework is included as part of the literature survey.

1.3 Review of Literature

1.3.1 Cities, Water and Sustainability

> *The city is man's most successful attempt to remake the world he lives in more after his heart's desire…..in making the city man has remade himself* (Park, 1967, p. 3)

Cities are complex and dynamic entities (Button, 2002); an emphasis on the sustainability of these entities started in the 1990s (Wheeler, 2000). No sustainable development strategy can ignore cities, as they are pivotal to all our current questions on political, economic, social, environmental, health-related and cultural fronts (Jacquet, Tubiana and Pachauri, 2010). When the term sustainability is applied to cities, it comprises of the goal to make cities healthy, enjoyable, resilient places to work and to ensure that the draw of their populations' consumption and enterprises' production on

local regional and global resources and sinks is not disproportionate (Satterthwaite, 2010). Goal 11 of the Sustainable Development Goals (SDGs) is to make cities inclusive, safe, resilient and sustainable (UN, 2015).

As cities are growing and many new cities are coming up, the 21st century will see water availability as the greatest natural resource challenge (Oyegun, 1985). With much of the urbanization processes taking place in Asian cities, 21st century will be an urban century especially in India and China (Saxena and Vijayakumar, 2014). According to the Department of Economic and Social Affairs, Population Division of the UN (2014), now more people in the world live in urban areas than in rural areas - with 54 per cent of the world's population residing in urban areas in 2014 and expected to increase to 66 per cent by 2050 (Amir, 2015). According to the Urban Institute of the University of Sheffield (2018), three per cent of the earth's surface has been urbanized and around four billion people are living in urban areas. We have entered the Anthropocene which indicates human dominance of earth systems (Brown and Schmidt, 2014). Urban dwellers use more of the earth's resources than their rural counterparts (Landry, 2006).

Urban areas are central to all aspects of sustainable development (Rydin, 2010) with water being at the core of sustainable development (UNDESA and UN WATER, 2015). Water is a critical issue of this century. Therefore, a fresh and reliable water supply is vital to sustaining life and supporting healthy communities, economies and environments (Benton-Short and Short, 2008). One of the challenges associated with the magnitude of urban change will be to supply water to urban areas (Srinivasan, Seto, Emerson and Gorelick, 2013), as many urban centers will be unable to expand supply to meet the demand because of poor governance (Vo, 2007). Beyond a certain level of urban growth, a lack of water resources could slow down development (Bao and Fang, 2007).

Water insecurity is a paramount threat to the future sustainability of global populations (Biggs, Duncan, Atkinson and Dash, 2013). The irresistible growth of urban areas has caused the number of people without an improved drinking water source to reach almost one billion (UNICEF, 2009). Water quality, too, is deteriorating in many areas because of pollution, and far too many people still lack access to safe and dependable sources of clean water (Mak and Damania, 2017).

Urbanization poses a major challenge in terms of provision of water supply services (Biswas, 2006). The supply of water to a city is for many uses and the demand is rising from all quarters (Oyegun, 1985). Water demand already exceeds supply in many parts of the world (Vairavamoorthy, Gorantiwar and Pathirana, 2008). The growth of cities throughout the world presents new challenges for securing water to meet societal needs (Gómez-Baggethun et al., 2013). Growing pressure on the world's water resources is having major impacts on our social and economic well-being. Even as the planet's endowment of water is expected to remain constant, human appropriation of water, already at 50 per cent by some measures, is expected to increase further (Cooley, et al., 2014).

It is a commonly held belief today that cities in their present form and functioning are unsustainable in terms of use and abuse natural resources (Cook and Swyngedouw, 2014). The very sustainability of cities and the practices of everyday life that constitute 'the urban' are predicated upon and conditioned by the supply, circulation, and elimination of water (Swyngedouw, 2004). Sustainability requires that the value of the fresh water capital stock should not decline over time. Rather, current fresh water use should not be at the cost of future generations, be it directly or indirectly (Pearce, 1993). Thus, cities of the 21st century must realize the many ways of sharing in urban life (Kazancugil, 2000).

Provision of clean water will be one of the major challenges of the present century, the magnitude and the complexity of which no earlier generation has had to face (Biswas, 2006). Water is therefore a parameter for inclusiveness in cities (Lupala, 2014). The challenge of securing sustainable and equitable access to water is enormous (Lu, Ocampo-Raeder and Crow, 2014). Given its fluid nature, and the multiple actors implicated in its extraction, use and distribution, reaching water equity creates a daunting set of challenges to collective action (Bakker, 2010).

Freshwater is fundamental to the well-being of the human population (UN, 2014) and is still wanting in terms of supply, coverage, quality and quantity (Lupala, 2014). Not all urban areas are proximal to freshwater resources, but heavy investment in large-scale hydraulic infrastructure has allowed many urban areas to develop water systems thus overcoming water insecurity issues associated with urban growth and/or geography (Padowski, Carrera and Jawitz, 2016). The availability of water may be plentiful but human activities can significantly degrade supplies and effectively limit access to safe water (Johnston, 2012). For instance, accesses to water in developing countries typically refer to a combination of sources including pipe connections on the premises, shallow wells and boreholes. It also refers to service levels in terms of hours of water supply from the piped connections (Lupala, 2014).

In all developing countries, unplanned and poorly managed urbanization processes have been a major source of social stress (Biswas, 2006). Land, air and water are the primary resources of the city. Urbanization increases the demand for land resources which results in water pollution (Mega, 2010). Municipalities across the globe are expected to increase annual water use by 43 per cent by the year 2025 (Gandhi and Namboodiri, 2009). With the beginning of this century, attention shifted to management as a major cause of the urban problems (Salman, 2014). There is also a growing

recognition that current water management practices are unsustainable (Brooks, Brandes and Gurman, 2009).

Urban water is necessarily transformed water, not only in terms of its physico-chemical characteristics, but also in terms of its social characteristics and its symbolic and cultural meanings (Swyngedouw, 2004). Philosopher Ivan Illich (1945) argues that since the industrialisation of H_2O and the convenience of water on tap, people have taken it for granted that has led to a deep cultural disconnect, and profound abuse (Withers, 2013).

There is a water crisis today but the crisis is not about having too little water to satisfy needs. However it is a crisis of mismanagement which has resulted in the misery of billions of people and the environment alike (Gandhi and Namboodiri, 2009). Human use and pollution of freshwater resources have reached a level where the sustainability of water resources is threatened. Water issues are intrinsically linked to other sustainable development issues such as poverty, hunger, health, education, gender inequality, ecosystems integrity, climate change and disasters (UNESCO, 2014).

1.3.2 Foregrounding Social Sustainability

The concept of sustainable development emerged with the publication of *Our Common Future* in 1987 as an attempt to bridge the gap between environmental concerns about the increasingly evident ecological consequences of human activities and socio-political concerns about human development issues (Robinson, 2004). Since then, protecting natural resources, and ensuring social justice are not conflicting anymore but have become interwoven and complementary goals (Victor, 2006). Hence sustainability has become a socio-ecological problem (Prugh and Renner, 2014).

The division of sustainable development into three pillars – the environment, economy, and society, indicates that a practice cannot be fully sustainable until all these three dimensions are satisfied (Casula and Soneryd, 2012). The concept of sustainable development is about achieving an appropriate balance between the three pillars. Basically, it is about reorienting the development trajectory so that genuine societal progress can be sustained (Meadowcroft, 2007). In fact, sustainable development refers to quality of life in the broadest possible sense (Casula and Soneryd, 2012). The values embedded in sustainability discourses are broadly anthropocentric (Marder, 2014) and our entry into the age of Anthropocene compel us to revisit the governance norms (Brown and Schmidt, 2014) in order to enable us to solve urbanization challenges as well as to grab the opportunities present in our cities (Biswas, 2006).

The different dimensions of sustainability have not been equally prioritized academically or by policy makers. This is not only because "sustainable development was born out of the synergy between the emerging environmental movement of the 1960s and the 'basic needs' advocates of the 1970s, but also because assessing the intangible nature of the social aspects of development presents measurement quandaries" (Colantonio, 2009). As a result, there is a limited literature focusing on social sustainability (Ibid). The social dimension has commonly been recognized as the weakest 'pillar' of sustainable development, notably when it comes to its analytical and theoretical underpinnings (Lehtonen, 2004). Yet sustainability is a topic of research that is basically social (Partridge, 2005) because it is ultimately an issue of human behaviour (Robinson, 2004).

According to the Brundtland Report (WCED, 1987), the definition of sustainable development which is given as – ''development which meets the needs of the present without comprising the ability for future generations to meet their own needs'' has a

clear social imperative (Axelsson, et al., 2013). But it was not until the end of the century that the international community began to understand that the goal of sustainable development must be to increase human abilities (Sierra, Pellicer and Yepes, 2016). Social sustainability has been a core element of the sustainability discourse, ever since the Brundtland Commission[3] stressed that we cannot solve the key environmental problems if global social equity issues are neglected. The social dimension is often the most challenging to incorporate into actual projects and policies (Dillard, Dujon and King, 2008). Recently, scholarly work has paid increasing attention to the social dimension of sustainable development (Boström, Vifell, Klintman, Soneryd, Hallström and Thedvall, 2015).

Social sustainability is a wide-ranging multi-dimensional concept, with the underlying question – 'what are the social goals of sustainable development?' which is open to a multitude of answers (Hopwood et al., 2005; Littig and Grießler, 2005). It is a concept that has been under-theorized or often oversimplifies in existing literature, and there have been very few attempts to define social sustainability as an independent dimension of sustainable development (Colantonio and Dixon, 2011). Little attention has been paid explicitly to the concept of social sustainability in the water literature (Hellberg, 2017). The "social" was integrated late into debates on sustainability (Eizenberg and Jabareen, 2017). For these reasons the relationships between the different dimensions of sustainability are still unclear (Colantonio and Dixon, 2011). Social sustainability is an open and contested concept. Over the years, there have been efforts to

[3] The World Commission on Environment and Development (WCED) also known as the Brundtland Commission was formed by the United Nations in 1983. Gro Harlem Brundtland was appointed its chairperson. The aim of setting up the commission was to unite countries to pursue sustainable development together by the year 2000 and beyond. In October 1987, the Brundtland Commission released the document *Our Common Future* also known as the *Brundtland Report*.

develop theoretical frameworks to define and study social sustainability and to empirically investigate it (Boström, 2012).

The concept of social sustainability can be interpreted differently depending on one's political and ideological convictions (Aucamp, Woodborne, Perold, Bron and Aucamp, 2011). One way to bring some conceptual order is to distinguish between a substantive dimension of social sustainability and a procedural dimension. Such a distinction is in line with various recent publications that discuss the concept of social sustainability (Boström, Vifell, Klintman, Soneryd, Hallström and Thedvall, 2015).

Another way is to look at social sustainability as having three inter-related components. First, a normative component indicating a broad vision of a desired end state that is both holistic and long term; second, it has a strategic component, indicating the desire to align a wide range of specific actions towards achieving the desired end state; and third, there is a descriptive component which talks about 'what is' in terms of how it can be measured against strategy and vision (Colantonio, 2008, 2009; Manzi, Lucas, Lloyd-Jones and Allen, 2010). It is these 'what is' components that are important in this study and will be further surveyed.

The following section highlights some of the selected interpretations / definitions of social sustainability drawn from extended literature.

1. According to Magis and Shinn (2009) social sustainability concerns the ability of human beings of every generation to not merely survive, but to thrive. Social sustainability plays a paramount role in the continuous journey toward sustainability, as ultimately it is human beings, individually and in collectives, which will determine economic and environmental well-being.

2. Social sustainability is mainly concerned with the relationships between individual actions and the created environment, or the interconnections between individual life-chances and institutional structures (Jarvis, Pratt and Cheng-Chong Wu, 2001).

3. It is development that improves the quality of life for all segments of the population (Polèse and Stren, 2000).

4. Social sustainability is about how individuals, communities and societies live with each other and set out to achieve the objectives of development models which they have chosen for themselves, also taking into account the physical boundaries of their places and planet earth as a whole (Colantonio and Dixon, 2009).

5. Social sustainability occurs when formal and informal processes, systems, structures and relationships actively support the capacity of future generations to create healthy and liveable communities. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life (McKenzie, 2004).

The following are definitions on social sustainability that emphasizes on the urban perspective:

1. Urban social sustainability is about the long-term survival of a viable urban social unit. It is the continuing ability of a city to function as a long-term viable setting for human interaction, communication and cultural development (Yiftachel and Hedgcock, 1993).

2. Social sustainability of a city is defined as development that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups and encouraging social integration, with improvements in the quality of life for all segments of the population (Polèse and Stren, 2000).

The concept of social sustainability is still developing (Axelsson, et al., 2013). While there is no consensus on the definition of social sustainability, it is commonly understood as related to a set of indicators or themes (Hellberg, 2017). Social sustainability also refers to a variety of aspects such as quality of life, inter- and intra-generational justice, and local populations' access to natural resources, access to green urban spaces, cultural diversity, gender issues, workers' rights, participation and development of social capital. It often refers to both the improvement of conditions for people and the quality of institutions or the governance of the process (Boström, Vifell, Klintman, Soneryd, Hallström and Thedvall, 2015). Much of today's literature expands on the belief that social sustainability not only promotes equality of amenities among community residents but also the development of stronger and more robust communities (Toole and Carpenter, 2013).

It is important that social sustainability be grounded in equality, democracy and social justice. Emphasis must be given for the preservation of social values, cultural traditions and ways of life (Woodcraft, 2012). Social sustainability is not only instrumental but also a goal towards which society should strive (Ahman, 2013). Over the last thirty years the concept of social sustainability has evolved giving a greater concern to social participation and the increase in the capacity of people to construct their future (Foladori, 2005).

Cuthill (2010) tell us that social sustainability framework contains an interdependent and self-reinforcing relationship between four key components (Fig. 1.1): (1) social capital, (2) social infrastructure, (3) social justice and equity and (4) engaged governance. There is an interdependent and self-reinforcing relationship between these four different aspects of social sustainability (Boström, Vifell, Klintman, Soneryd, Hallström and Thedvall, 2015).

Figure 1.1: Components of Social Sustainability Framework

Source: **Cuthill (2010)**

Besides the ones discussed, the following tables are compiled to categorize further the themes, principles, elements, criteria and indicators related to social sustainability drawn from various literatures:

Table 1.2: Themes, Elements and Criteria of Social Sustainability

Themes, Elements and Criteria	Reference
Social justice and equity, social infrastructure, engaged governance, and social capital	Cuthill (2010)
Human well-being, equity, democratic government, and democratic civil society	Magis and Shinn (2009)
Sense of community, local well being and security, and the elimination of poverty, a more equal society (equity)	Rydin (2010)
Social exclusion, social capital, governance	Manzi et al., (2010)
Equity and human rights, quality of life, biodiversity and ecological integrity, 'sense of place' and heritage, precaution, hope, vision, symbolic and iterative change	Baines and Morgan (2004)
Social capital and human capital and social carrying capacity	Mauerhofer (2013)
Equity, awareness for sustainability, participation, and social cohesion	Murphy (2012)
Diversity, interconnectedness, equity, quality of life, democracy and governance	McBride (2009)

Source: **Compiled by the author**

Table 1.3: Key Themes for the Operationalisation of Social Sustainability

Features	Reference
Livelihood Equity Capability of withstanding external pressures Safety nets	Chambers and Conway (1992)
Inclusion Equity Poverty Livelihood	DFID (1999)
Equity Democracy Human Rights Social Homogeneity Equitable income distribution Employment Equitable access to resources and social services	Sachs (1999)
Paid and voluntary work Basic needs Social security Equal opportunities to participate in a democratic society Enabling of social innovation	Hans Böckler Foundation (2001)
Social justice Solidarity Participation Security	Thin et al. (2002)
Education Skills Experience Consumption Income Employment Participation	Omann and Spangenberg, (2002)
Interactions in the community/social networks Community participation Pride and sense of place Community stability Security (crime)	Bramley et al., (2006)

***Source*: Colantonio and Dixon (2011)**

Table 1.4: Criteria for Social Sustainability

Criteria considered	Author(s)
Equity; democracy; human rights; social homogeneity; equitable income distribution; employment; equitable access to resources and social services	(Sachs, 1999)
Equity; health; education; housing; security; population	(UNDSD, 2001)
Income; communication and participation; education; social contacts; social security; distribution of income and assets	(Spangenberg, 2004)
Citizen participation; social interaction; feeling of belonging; interpersonal relations among the neighborhood residents; collective action; mutual support; access to facilities and amenities; safety	(Choguill, 2008)
Social equity; access to facilities and social access to facilities and amenities; affordable housing; social interaction; safety/security; satisfaction with home; stability (turnover); participation in collective group civic activities	(Bramley, Dempsey, Power, Brown, & Watkins, 2009)
Equity; inclusion; adaptability; security	(Colantonio, 2009)
Access to facilities and amenities; amount of living space; health of the inhabitants; community spirit and social interaction; safety; satisfaction with the neighborhood	(Dave, 2011)
Social interactions; participation; community stability; pride and sense of place; social equity; safety and security	(Dempsey et al., 2011)
Accessibility; social capital and networks; health and well-being; social cohesion and inclusion; safety and security; fair distribution (income, employment); local democracy, participation and empowerment; cultural heritage; education and training; equal opportunities; housing and community stability; connectivity and movement; social justice; sense of place; mixed use and tenure; attractive public realm	(Weingaertner & Moberg, 2011)

***Source*: Sharifi and Murayama (2013)**

Chatzinikolaou, Manosand and Bournaris (2012) used the following indicators of social sustainability for rural Europe:

(a) Members of a sports club, recreation or other social organization

(b) Using the internet for buy production means

(c) Using internet for sell products

(d) Lifelong learning

There are no ultimate indicators for social sustainability but the need for indicators is wanting and strong (McBride, 2009). The indicators and themes are all interrelated (McKenzie, 2004) and to some extent, they overlap (Baines and Morgan, 2004). Despite an apparent lack of consensus on the scope and meaning of social sustainability, there seem to be some broadly accepted common ingredients (Baines and Morgan, 2004). In the opinion of Woodcraft (2012), there seems be a consensus in the social sustainability literature that incorporates a set of underlying themes that could be described as social capital, human capital and well-being. Adding to that, two main perspectives usually emerge in all researches conducted on social sustainability: on the one hand, ethical values and norms and, on the other hand, issues related to community engagement. Social sustainability can be considered as a combination of both these aspects (Pareja-Eastaway, Elsinga, O'Mahony, Eng, Wachter and Lovell, 2012). Moreover, new 'soft' themes such as happiness, well-being and social capital, are becoming central to the social sustainability dabate, together with more traditional 'hard' concepts, which include basic needs, equity and employment (Colantonio and Dixon, 2011).

According to Landorf (2011), 'basic needs' and 'equity' are the most common and fundamental themes of social sustainability. Both concepts are necessary for the

physical and psychological survival of individuals. Also themes associated with the wider social organisation of communities, such as 'social capital', 'social cohesion' and 'social identity' are common. All of these factors are presumed to make communities socially sustainable and enhance their capacity to meet basic needs equitably. Several theoretical positions and their associated key social sustainability themes are shown in Table 1.5.

Table 1.5: Key Social Sustainability Dimensions and their Characteristics

Dimension	Characteristics
Social equity	Access to services, facilities and opportunities, level of institutional stability and flexibility
Social coherence	Strength of networks, participation, identification and tolerance, level of empowerment and accountability
Needs satisfaction	Objective satisfaction of basic needs, subjective satisfaction of basic needs

Source: **Landorf (2011)**

From the above tables, we can see the extent of the concept by looking at the many indicators, themes and features. Social sustainability must be regarded as an ongoing process which is underpinned by a specific set of social conditions and values, rather than as a fixed outcome to be achieved within a definite time horizon (Aucamp, Woodborne, Perold, Bronand and Aucamp, 2011). The more one includes within the frame of social sustainability, the more difficult it becomes to understand it, much less to achieve it (Boström, 2012). The principles and themes required for generating social sustainability (Devidson, 2009) have been explored thus far. We shall take the

examination of the concept of social sustainability further by looking at more interpretations and elucidation.

The social dimension of sustainable development is bipolar both at individual and collective levels. First it is reflexive – based on our subjective perceptions and interpretations of social conditions; second, it is immaterial where the social phenomena themselves are essentially immaterial and therefore difficult to grasp and analyse (Lehtonen, 2004).

According to Vallance, Perkins, and Dixon (2011), social sustainability is a concept to describe a collective understanding of the need to build a community in order for individuals to thrive with equal access to opportunities for individual development. This includes the notion that it is a human right for all individuals to have access to basic needs and to promote the idea of thriving within a community instead of just surviving. They gave a threefold structure of social sustainabilities, which comprises of (a) 'development sustainability' which addresses basic needs, the creation of social capital, equity and so on; (b) 'bridge sustainability' which concerns changes in behaviour so as to achieve bio-physical environmental goals; and (c) 'maintenance sustainability' refers to the preservation of socio-cultural characteristics in the face of change, and the ways in which people actively embrace or resist those changes (Wolbring and Rybchinski, 2013; Eizenberg and Jabareen, 2017).

Social sustainability is a notoriously complex concept (Yung and Chan, 2012). In short, social sustainability refers to both the improvement of conditions for living people and future generations and the quality of governance of the development process (Boström, 2012). The concept of social sustainability has been changing to accommodate many different foci of concerns and today, the concept has become more relevant (Jacobsen and Delaney, 2014).

1.3.2.1 Social Sustainability and Cities

Social sustainability is people-centered and pro-people. In this era of urban century, much of the social sustainable development will occur in cities and towns. The role of cities in sustainable development has become more prominent due to the growing urban population all over the world (Dempsey et al., 2011). Basic social sustainability concerns the social balance within an urban community (Hilgers, 2013). Within the context of urban areas, emphasizing social equity may assist cities in evolving to become better places by facilitating a fairer distribution of resources (Yung and Chan, 2012). In recent years, a number of cities have adopted the concept of social sustainability in their policies (Davidson, 2010).

Since the very origins of the city there have been concerns over how to maintain its social life. The recent concerns over the sustainability of urban societies and engagement with social sustainability might therefore been seen in a long historical tradition that was concerned with the fragile nature of urban societies (Davidson, 2010). The concept of urban social sustainability conceives the city as a backdrop for lasting and meaningful social relations that meet the social needs of present and future generations (Yiftachel and Hedgcock, 1993). Social sustainability of cities cannot be limited to a technical, problem-solving approach, or institutional management. Rather the local context and its history are fundamental factors to consider in fostering a dynamic sustainability. When we look at the social aspect of sustainability, it is essential to consider the contentious nature of the urban change, the networks and alliance necessary to implement a new voluntary orientation (Hilgers, 2013). Social sustainability requires minimum social conflict. In practice this means that development should increase people's control over their lives in such a way that all social groups have the opportunity to take part in meaningful decision-making (Reid, 1996).

Social sustainability is related to the ability of cities to provide a feasible framework where interaction between people is preserved throughout the existence of communication channels where exchange of ideas, cultures, norms, and traditions takes place (Pareja-Eastaway, Elsinga, O'Mahony, Eng, Wachter and Lovell, 2012). A socially sustainable city is marked by vitality, solidarity and a common sense of place among its residents (Yiftachel and Hedgcock, 1993). Polèse and Stren (2000, p. vii) assert that "the cities of the twenty-first century must place the citizen at the center of public policy, reinvent the concept of the city, and realize the many ways of sharing in urban life".

Social equity is a dimension that is essential to produce social sustainability (Bramley and Power, 2009) in urban areas. An equitable society is one with no exclusionary or discriminatory practices hindering individuals from participating economically, socially, or politically. Within an urban context, social equity is related to access to services, facilities and opportunities (Santa-Cruz, 2016). Urban developments in order to be socially sustainable should create a harmonious living environment and improves quality of life in general (Chan and Lee, 2008).

Central epistemological axes in urban studies resonate particularly well with key tenets of sustainability including inter-/intra-generational equity and good governance as well as the welfare for place, communities and culture (Wolfram and Frantzeskaki, 2016).

Based on the literature review of the concept of social sustainability, there are a number of social components that are keys to analyzing and understanding social sustainability. The elements of 'equity' and 'governance' would be used in this study to generate insight into social sustainability of urban water supply systems in the city of Shillong, India. These two indicators of social sustainability will be discussed in this section below.

1.3.3 Equity

The term equity is a key social concept in sustainable development discourse (Murphy, 2012). According to Sachs (1999), one of the basic values that social sustainability must rest on is equity. Colantonio (2008) also opines that equity is a fundamental component mentioned in much of the literature on social sustainability. Being the most commonly mentioned requirement for social sustainability, it must be the overarching guiding principle for any approach to social sustainability.

Numerous authors argue that social sustainability must have a redistributive element and that a sustainable community must be an equitable one (Partridge, 2005). It is generally agreed that equity implies a need for fairness in the distribution of welfare goods and life chances, and the entitlement of everyone to an acceptable quality and standard of living (Beder, 1996; Murphy, 2012). Equity focuses on the social disparities that threaten to rip society apart (Ahman, 2013).

As one element of justice (Patrick, 2014), equity is principally concerned with relationships between people, and with their relative circumstances (McDermott, Mahanty and Schreckenberg, 2013). Social equity issues are powerful political and policy concerns, and centre upon a distributive notion of social justice (Bramley, et al, 2006).

Equity is based on the idea of moral equality, the principle that people should be treated as equals. This is the idea that, despite many differences, all people share a common humanity or human dignity and, as a result of this, we must consider how each of them should be treated (Jones, 2009). Equity is not simply a normative concern. It is a material factor which directly impinges on the process of social and material sustenance. In fact, equity enhances a city's transformative capacity while also promoting identity and agency among the population (UN-Habitat, 2013).

Besides being relative, equity is also a matter of subjective perspective. It can be determined by history and social conditioning, and permits no universally acceptable definitions. The concept of equity is value laden. The extrinsic bases of these values could be common human values of fair-play and justice or be much more specific and established notions (Phansalkar, 2007). Equity is informed by deeper ethical principles (Perreault, 2014).

To Eizenberg and Jabareen (2017), the concept of equity is a central component of the social sustainability framework which comprises of three dimensions:

(a) **Redistributive**: This concept suggests that social distributive justice entails ensuring that people have various rights like the right to clean air, water, and related resources.

(b) **Recognition** of the voices of vulnerable groups, the disadvantaged in policies that determine their lives.

(c) **Participation**: Recognizing the membership of people in the moral and political community and promoting their capabilities.

Franks (2015) gives similar dimensions of equity: distribution, procedure and recognition where 'distribution' is about the costs and benefits that affect human wellbeing; while 'procedure' is about the inclusiveness of decision-making processes; 'recognition' is about recognizing stakeholders' rights, interests, concerns and grievances necessary for procedural equity.

The concept of equity is a complex and protean idea. It is not some objective state of being, but rather an ideal, vision, or aspiration (Whiteley, Ingram and Perry, 2008). Equity defines the principles that should underpin the distributive allocation of

resources (Syme and Nancarrow, 2008). It is a needed condition for a just society (Whiteley, Ingram and Perry, 2008). Equity is "a belief that there are some things which people should have, that there are basic needs that should be fulfilled…..and that policy should be directed with impartiality, fairness and justice towards these ends" (Falk, Hampton, Hodgkinson, Parker, and Rorris, 1993, p. 2).

Equity in resource management means the allocation of more resources to disadvantaged groups so as to make the system as a whole more fair. Therefore, interventions, which seek equity, should devise ways to give marginalized groups more benefits (Timsina and Luintel, 2003). The way in which water resources are allocated and developed will play a major role in determining whether human poverty is alleviated or exacerbated in the near future. Ensuring equitable distribution is essential. Equity in allocation means that all users should have a fair access to water they need for their activities (Kansiime, 2002). As already stated, social sustainability is dependent on social equity. Within an urban context, social equity is related to access to services, facilities and opportunities, and adequate infrastructure (Santa-Cruz et al., 2016). As we know, one important principle of equity is the equal concern for people's needs. Water, which is a matter of necessity, should be distributed proportional to people's level of need and nothing else (Jones, 2009).

1.3.3.1 Water Equity

Water is the quintessential equity issue because it is absolutely necessary to sustain life, livelihoods and environmental quality (Wilder and Ingram, 2016). Equity in water is impacted by competing uses, whether at the individual and household level or even between communities (Lu, Ocampo-Raeder and Crow, 2014). Water equity is aspirational, contextual and relational (Wilder and Ingram, 2018).

According to the UN-Habitat (2013), addressing inequities requires political will, strong institutions and well-targeted policies. Promotion of equity also involves enhancing socioeconomic equality and providing for civic participation by all in the social, political and cultural spheres. Equity is about social and political relations among urban populations as well as among government institutions and individuals and social groups. It is the relational dimension which underlies the degree to which a city operates and sustains as a collective entity (UN-Habitat, 2013).

The concept of equity is both very simple and complex: it is, simple because everybody is aware of it and complex because there is no single best measure of equity. Equity of water distribution refers to the delivery of a fair share of water to users throughout a system (Ameyaw, Memon and Bicik, 2013). According to Goff and Crow (2014), water access is equitable if residents are able to live healthy lives that they value.

Matthew Goff (2013) provides some basic inputs for an improved equity formula for water, which are: quantity, quality, cost, ease of access, collection time and distance, physical strain of access, ease of facility, reliability of supply/ uncertainty of availability and water connection proximity to water. The issues that constitute equity in access to and provision of water are wider than the quantity and quality of water. They can include labour time spent collecting water, health outcomes from inadequate water and sanitation, work and other opportunities foregone because of water collection, certainty of supply, the valuation of domestic work, costs of dealing with conflict resolution between multiple stakeholders, and income-earning and business opportunities made possible by water supply (Lu and Ocampo-Raeder, 2014). Furthermore, Ingram, Scaff and Silko (1986) give us principles that are necessary conditions for water equity - reciprocity, value-pluralism, participation, promises, and responsibility.

The framework presented by McDermott et al., (2013) has three dimensions of equity. These are (a) distributive equity concerned with the distribution of the resource and its benefits; (b) procedural equity that investigates decision-making processes and procedures; and (c) contextual equity that addresses the pre-existing conditions and power relations that enhance or curtail people's access to decision-making, resources and its benefits.

The equity concept implies that water allocation among the competing users should be based on the overriding criterion of social justice. It also implies protection of water rights and access to safe drinking water, as it is a basic human need (Rasul and Chowdhury, 2010). In terms of measuring social equity, accessibility is commonly cited as a fundamental measure (Dempsey, Bramley, Power and Brown, 2011). Equity in allocation means that all users should have a fair access to water they need for their activities (Kansiime, 2002).

The concept of equity, in the context of water governance, can refer primarily to distributional issues like fairness in access to drinking water (Perreault, 2014). Achieving equitable access implies a form of governance that includes considering different political constellations of organizing the hydrosocial cycle (Swyngedouw, 2014).

1.3.4 Water Governance

Water is a key element in terms of distributive equity among communities and therefore a parameter for inclusiveness in cities (Lupala, 2014). Both in academia and policy circles, the attention has shifted from water management towards water governance. With the shift, the principle of equitable utilization has emerged in the literature as an important principle for allocation (Doorn, 2012). Water governance is critical to water security and to the long-term sustainability of freshwater. The shift from

‘government’ to ‘governance’ is a prescribed method that promises better solutions to natural resource management (Bakker, 2013).

Governance is seen as processes of interaction. It is based on accommodation rather than domination. Governance is also many times considered as facilitating action since it involves activities for resolving common problems. Governance also puts emphasis on networks, flexibility and informal institutions (Tropp, 2006). Governance systems reflect a community’s or a society’s collective view about what it is, what it believes in, and what it wishes to become (Cullinan, 2014). Governance systems determine who gets what water, when and how and decide who has the right to water and related services and their benefits. Governance is one of the biggest challenges within the water sector (UNDP and IFAD, 2006). Governance is a foundation of social sustainability (Ajmal, Khan, Hussain and Helo, 2017).

The following are four definitions/interpretation of “water governance”.

1. It is the political, economic and social processes and institutions by which governments, civil society, and the private sector make decisions about how best to use, develop and manage water resources (UNDP, 2004).
2. Water governance is defined as the range of political, organizational and administrative processes through which communities articulate their interests, their input is absorbed, decisions are made and implemented, and decision makers are held accountable in the development and management of water resources and delivery of water services (Bakker, 2003b)
3. Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society (Rogers and Hall, 2003).

4. Franks and Cleaver (2007) defines water governance as the system of actors, resources, mechanisms and processes which mediate society's access to water.

Batchelor (2007) talks about 'distributed governance', which embraces the governance of both formal and informal institutions in the management of water. The actual realization of the right to water depends on context-specific governance processes, mechanisms and actors (Morinville and Rodina, 2013).The discursive shift from water management to water governance reflects a shift of attention from the isolation, or abstraction of water itself, to the complex relationship between water and people (Linton, 2011).

Governance generally refers to questions about forms of power and authority, patterns of relationship and rights and obligations among the people facing common problems (Newman, as cited in Tropp, 2007). In a sense, governance is about the processes of making choices, decisions and trade-offs (Tropp, 2007).

Governance to ensure social justice dates back to the period when cities have flourished. What is new is the awareness that reducing inequities is fundamental to solving sustainability issues and that they are entirely synergistic (Newman and Jennings, 2008). According to the UNDP Water Governance Facility, water governance determines the equity and efficiency in water resource and services allocation and distribution, and balances water use between socio-economic activities and ecosystems (UNDP and SIWI, 2015).

The challenges of water governance are most acute in developing countries because of the problem of "bad hydrology" (Briscoe, 2009; Araral and Wang, 2013). Also, water management and governance suffers due to reasons that range from the usual constraints like short-term planning, shortage and inappropriate use of financial

resources, to lack of institutional and human capacities (Tortajada, 2010). Moreover, issues of urbanization, climate change, lack of awareness, lack of ambition and government effectiveness, and limited financial resources for infrastructure construction and maintenance pose immense governance challenges particularly for cities in developing countries (Van Leeuwen, Koop and Sjerps, 2016). According to Biswas and Tortajada, 2010b), physical scarcity of water, lack of availability of investment funds, inability of the poor to pay for water, lack of expertise, and among many other reasons are only excuses to hide the real and fundamental reason which is poor leadership and governance.

As already indicated, governance is not confined to the actions of the governing authority but is dispersed through society as a culture of governing, enacted through a number of agencies to the level of the individual (Eddy, 2006). The issue of governance, multilevel or not, implies that people, not water, should be central to water governance. From a governance perspective water management is about the hearts and the minds of the people and their vital interests (Toonen, 2011). Fundamentally, water governance deals with how a society governs the access to and control over water resources and their benefits (Slinger et al., 2011). Human and social capitals are as important as money, and form the key to good water governance (Toonen, 2011). Management of fresh water resources is of critical importance to healthy social, economic and political well-being of a society (Van Leeuwen, Koop and Sjerps, 2016). In the absence of good systems for resource distribution, the future holds dark clouds (Seyle and King, 2014).

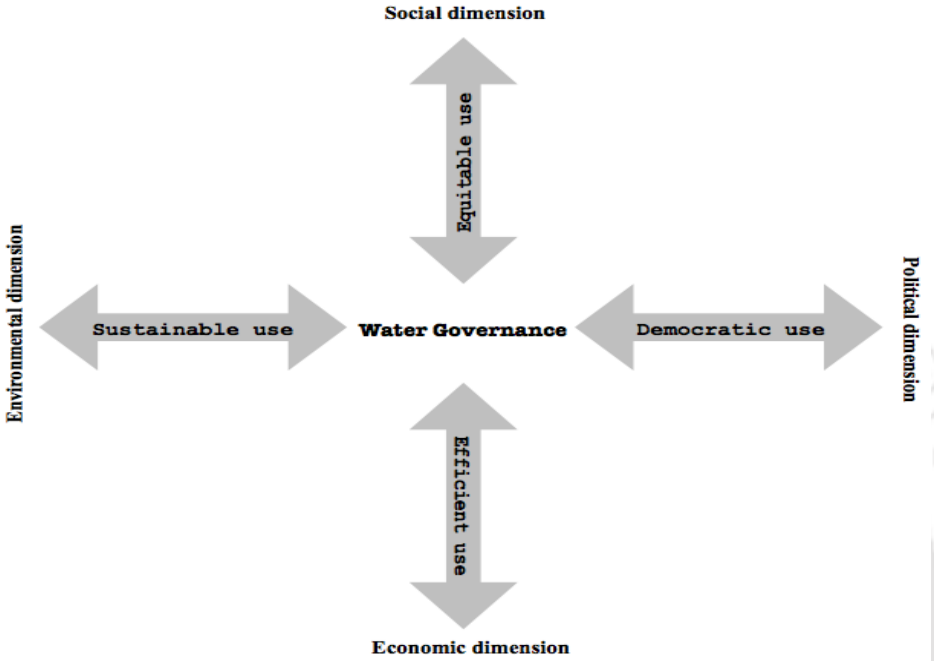
1.3.4.1 Good Water Governance

One of the key propositions of the Rio Declarartion (1992) is the process of ‘good governance’, which is a precondition for achieving sustainability at the local level.

The logic behind this proposition is two-fold. First, achieving sustainable devlopment cannot be secured by governments alone. It will be necessary to mobilize the enrgies and initiative of local communities for changing attitudes, values and behaviour are to be secured. Second, the governance process is regarded as a key mechanism to participatory decision-making, thereby increasing political engagement and levels of acceptance of decisions and policies for sustainable development (Evans, Joas, Sundback and Theobald, 2006). Social sustainability often refers to both the improvement of conditions and the quality of governance of the development process (Boström, 2012).

There is no universally acclaimed definition of good governance. However, one can argue that good governance requires transparency and accountability, fosters participation and representativeness, promotes fairness and equity, accomplishes effective and efficient allocation of resources, peacefully resolves conflict, meets obligations to future generations, is ethical and future-oriented (Tonn, 2012; GWP, 2002). Governance is essentially a process and what makes it 'good governance' is the capacity of achieving results in a fair and inclusive manner that leads to sustainable water management practices, that contributes for ensuring water security in the long term, and that is in conformity with the goals established and accepted by any given society and by the international community (Akhmouch and Correia, 2016). Governance is good if it can help to solve key water challenges, using a combination of bottom-up and top-down processes while fostering constructive state-society relations (Akhmouch, 2016). Further, good governance requires proper allocation and management of resources to collective problems, that is, all citizens receive in a timely and efficient manner requisite public goods of appropriate and acceptable quality (Biswas and Tortajada, 2010a). In analysing good water governance, Tropp (2005) gives four dimensions, as shown in Figure 1.2.

Figure 1.2: Dimensions of Good Water Governance



***Source*: Tropp (2005)**

Good governance is an important pillar of water management, which enhances various aspects, such as promoting decentralization, building capacity, and strengthening and monitoring evaluation, research and learning at all levels (Khadka, 2010). Water governance has more to do with people than with water. Therefore, the emphasis should be on connecting people (van der Valk and Keenan, 2011). Governance mechanisms allow flexibility and innovation and, by allowing a wide range of groups and organizations to work together and determine their own objectives and activities, they are a key component of ensuring social sustainability (Manzi, Lucas, Lloyd-Jones and Allen, 2010).

Around the world, the allocation of water is still treated as a technical problem when in fact it is primarily a social problem (Susskind, 2013). Unless the urban water governance practices are improved significantly universal access to clean drinking water will remain an unachievable dream, even if hundreds of billions of dollars are made available (Biswas and Tortajada, 2010b).

Governance for sustainability (Shiroyama, Yarime, Matsuo, Schroeder, Scholz and Ulrich, 2012) requires participation, promoting new alliances and new ways of mobilizing resources (Allen and Cochrane, 2007). Governance is a core issue within debates about sustainability, partly because existing arrangements are responsible for the problem and partly because creating new ways to do things together is a part of the solution (Manzi, Lucas, Lloyd-Jones and Allen, 2010). Without good governance, society's water problems may be ignored, or the purported solutions may be corrupt, too short-sighted, or simply too little, too late (Tonn, 2012).

1.4 Research Gap

The survey of literature suggests that no comprehensive work has been undertaken as such on the issue of water supply using the social sustainability approach. The concept of social sustainability and its two elements of 'water equity' and 'water governance' have been summarised and discussed applicably. As has been mentioned earlier, social sustainability is still at a budding stage though the original concept presented by the Brundtland Commission focused on the idea of sustainable development which has social issues at its core. Somehow, this focus has been lost. Also, most of the research pertaining specifically to it has been carried out in the West covering themes of urban development like city planning, urban housing, urban agglomeration, etc.

However, there are gaps in literature and discussion which we have tried to address in this study.

From the existing literature review, the researcher has learnt that social sustainability has not been explored from the 'water equity' and 'water governance' perspectives. Past studies have overlooked the relationship between these two variables. Also, water supply systems in the present field site have never been examined from the social sustainability point of view. So far, no research conducted on water in Shillong city has employed the social sustainability perspective. This study follows practical approach and aims to fill the research gap in existing literature of social sustainability in the city. The outcome of the study will enhance to apply consideration of social sustainability to projects, policy development and programme implementation.

1.5 Rationale for the Topic

Shillong, the capital of Meghalaya is the second largest urban center among the Northeastern states. In terms of its economic, administrative and commercial importance it is perhaps second to Guwahati. The city supports about 60 per cent and about 96 per cent of the total urban population of the Meghalaya State and the District of East Khasi Hills respectively (Census 2001). Shillong is located on the northern slopes of the Shillong ridges which mark the highest part of the Meghalaya Plateau. It is from here that many streams originate to flow either towards the north to the Brahmaputra river system or towards the south in the Bangladesh plains in the Surma valley. These streams are rain fed and dry up especially during the dry season and create water scarcity.

The growth of Shillong as an urban center can be traced down to the period of 1863-64 when the British shifted the administrative headquarters of Khasi and Jaintia Hills from Cheerapunjee (due to its inclement weather) to Shillong associated with a

salubrious climate and ample water resources for meeting the water demand (Pakem, 1984). From a mere population of 9621 as per 1901 census, Shillong has grown with a total census recorded population of about 3,54,759 persons (Census, 2011).

This rapid urban population growth both natural and migration induced is having its toll on the existing resources, which was initially designed to sustain a much smaller size of population. With urbanisation the demand for water increases with population growth and better standard of living. But the total quantum of water supply remains the same or in some cases reduces due to loss of vegetation cover and constructional activities. Hence urbanisation and growth of population has a pressure on the land resources which has its direct impact on the hydrology of the area. Like many other cities in the developing world, city authorities seem unprepared for the urban onslaught. With an annual rainfall of 2167mm (85.3 inches) and having a hilly topography, Shillong has ample water resources ranging from springs to rivers. However, there is extensive inequitable distribution of water in the city. Similar to many Indian cities, there is gross mismanagement of water in the city (Ahluwalia, 2014).

Water supply is basic to human security (Galaitsi, Russell, Bishara, Durant, Bogle and Huber-Lee, 2016) and inequitable water supply is a major challenge to cities of developing countries (Mohan Kumar, Manohar, Pallavi and Anjana, 2013). Many water related problems can be attributed to governance failure at multiple levels of governance and our knowledge on water governance systems and conditions for success of water governance reform is still quite limited (Pahl-Wostl, 2017). Shillong, like other cities in the developing countries abound in domestic water supply problems. This study will help in better understanding the main reason for water inequity which is mismanagement caused by deficient and disappointing water governance.

Shillong city is chosen as a site of study because of recurrent urban water problems and to improve the understanding of a specific problem and with the "intent of contributing to the solution" (Hedrick, Bickman and Rog, 1993). My thesis proposes to look at several of these issues in the process developing an alternative discursive framework to understand Shillong's water problems and the issue of water more broadly. Also this study seeks to add to the small cities literature in trying to understand the uniqueness of the study area with reference to water and thus reiterating the importance and prevalence of small cities (Bell and Jayne, 2009) in contributing to global urban sustainability. The results and finding of this dissertation can be juxtaposed with other small cities, hill stations, urban areas of the north east, India and the world for further research.

1.6 Objectives of the Study

The present study follows the social sustainability perspective, and attempts to identify the major constraints in urban amenities associated with equitable supply of water and water governance in Shillong through the following objectives:

1. To examine the nature of distribution of water in Shillong. A systematic and structural inquiry into the potential demand and requirement for water services will be undertaken.
2. To study the involvement of local institutions in water supply and other related water activities in the localities of Shillong. For this, the traditional institutions, chiefly the *dorbar shnongs*, would be examined.
3. To understand the water governance system, role and impact of these traditional institutions on water supply in Shillong. This will provide detailed information

concerning the degree of involvement of local institutions in water supply and other related water activities in the localities of Shillong.

1.7 Research Questions

On the basis of the theoretical premises on social sustainability with an extended review of relevant literature on elements such as equity, governance and water supply systems, the research questions of the present study are:

1. What is the present state of domestic water supply systems in Shillong in terms of equity?
2. What is the position and role of the *dorbar shnongs* in water governance?
3. What are the differences and similarities in the roles of the *dorbar shnongs* and what impact do these have on water distribution?

For attaining the above objectives and research questions the present research work is based on analyses and interpretation of both secondary and primary data. The whole study is based on empirical facts and figures which have been obtained by employing the following tools and techniques of data collection.

1.8 Research Methodology

For the study, qualitative method is combined with data tabulation of numerical data in order to provide a general picture (Punch, 2005). The numerical data is connected with the qualitative and embedded in it. The study takes a qualitative approach where this method is described as "procedures for the analysis of raw data that consists of words or pictures . . . in qualitative research, data-collection and analysis methods are not

standardized but unique, often with a variety of methods being used in an iterative fashion that fits the peculiarities of the research problem" (Aunger and Dow, 1997).

Concurrent sampling was used in which non-probability method for numerical data and qualitative purposeful samplings are combined as independent sampling procedures (Creswell, 2009). Questionnaire and interview were the main research tools used in the study. In-depth semi-structured interviews were carried out with headmen of selected localities, PHED engineers, academicians and other experts and members of households. Narrative research method was also incorporated. Narrative research was found to be useful to the study because of a breach between the ideal and real selves of water consumers in terms of water as need (Bloor and Wood, 2006). Through the household survey in the form of questionnaires, both qualitative and quantitative data were collected from the sample.

The tools of key person interview and questionnaires were used to answer the research questions and to gain a clear understanding of the water management in the city.

Household Survey

Numerical data was mostly obtained from the questionnaire survey distributed to the water consumers. The questionnaire was designed in such a way so as to gather data pertaining to water supply and the respondents' subjective opinions on water quality, governance, etc. The questionnaires were designed keeping in mind the objectives of the study. The questionnaire is a structured-non-disguised type. The Likert scale is also used in the questionnaire. In selecting the sample localities, care was taken to see that there was sufficient geographical coverage. One of the main thrusts of the study is to compare data between and within the municipality and the non-municipality localities. So the study was approached in a manner to achieve the required. It covered localities in both

the areas. The sample universe consists of all the adult population of the city of Shillong. Profile of the questionnaire survey respondents is given in Table 1.6.

Through the household survey both quantitative (numerical) and qualitative data was collected. The questionnaire survey was carried out in two hundred households across the city. The sampling method was snowball combined with homogeneous convenience sampling method. The questionnaire is self-administered. The open ended question allowed the respondents to express their attitudes and opinions which added depth to the survey findings. This was done to get an overview of the nature of water supply in the different parts of Shillong and especially to study the differences in household water supply between localities that fall within the municipal jurisdiction and those that do not**.** In this survey, the respondents represented twenty localities within the municipal area and twenty eight localities outside of the municipal area (Table 1.8). The number of respondents ranges from 1-5 from each locality. A large number of localities were chosen in order to get a vast perspective of the water supply scenario in the city. This is because the water supply with regards to quantity and duration differ from locality to locality. The reasons for this are many, for example the presence of a spring in one locality and absence of such in another adjacent locality will show water disparities especially in localities outside the municipal area.

Interview

Both purposive and snowball probability sampling was used for the interviews. From these key person interviews, a wealth of information was acquired. From the office bearers of the *dorbar shnongs* information was provided regarding the working of the *dorbar shnongs*, in the past and present situation of the water supply in their respective localities, the plight of the poor people, and water sources that are available, their take on

the future and other related topics. This kind of information could not have been acquired though the questionnaires alone. These *rangbah shnongs* are mostly elderly people with a lot of experience in local administration. They are responsible for their residents and hence they have a lot of insight and knowledge of individuals and collectively also. The engineers provided valid information that is necessary to understand the water situation from the supply side. Unstructured and semi-structured interviews were conducted with *dorbar shnongs*, academicians and other experts acquired a wealth of information, suggestions and subjective opinions that helped weaved the study together (see profile of interviewees in Table 1.7). Most of the interviews were audio recorded. Transcribing the interviews provided for a thorough examination of what people said (Bryman, 2012).

Photography

Photography was also used as it has the potential to be a visual language with which we can chronicle and represent reality (Moran and Tegano, 2005). Taking photographs can also allow the researcher to reflect on what they encounter in their fieldwork and on their own relation to the field (Rose, 2014). Photograph taken by me during fieldwork are inserted in relevant sections of the chapters.

Narratives

Narrative approach was conducted with seven interviewees in the municipality localities and ten interviewees in the non-municipality localities. This generated information regarding the poor and their water experiences. Narrative research is useful to apply when there has been a breach between their ideal and real selves or between the self and society (Williams, 1984). The most transparent value of narrative research is its ability to ‘give a voice’ to the individuals or groups being studied (Haines, 2011).

Non-Participant Observation was also used as a tool to a certain extent. It helped in understanding and generating questions related to the study.

Literature review and interviews were used in drawing interpretations from the questionnaire data. This analysis was then represented using tables for a clearer understanding. From the interviews data was thematically analysed to understand the water governance systems that exists in Shillong. Much of the analytic reasoning made in this study to draw wider conclusions can be termed inductive (Thomas, 2006).

Secondary data was collected from the following sources:

(1) Meghalaya Urban Development Authority (MUDA)

(2) Department of Urban Affairs, Government of Meghalaya

(3) Central Groundwater Authority, Shillong

(4) *Dorbar Shnongs*

(5) Meghalaya Basin Development Authority (MBDA)

(6) North Eastern Hill University (NEHU) and Synod College Libraries

(7) Local newspapers- *Mawphor* and *The Shillong Times*

Table 1.6: Profile of the Questionnaire Survey Respondents

Social Demographics of Respondents		Percentage
Gender	Female	62
	Male	38
Age	18-25	32
	25-45	45
	45-60	23
Occupation	Government Service	74
	Self Employed	10
	Retired/Housewife	16
Household Size	2-3	7
	4-6	69
	7-10	24
Type of House	Independent House	57
	Apartment/rented house	41
	Govt. quarter	2

Table 1.7: List of Interviewees

I. Headman/Secretary of the *dorbar shnongs* of municipality and non-municipality localities:

A. Municipality Localities

Sl. No.	Municipality Localities
1	Cleve Colony
2	Laban
3	Umsohsun
4	Wahingdoh

B. Non-Municipality Localities

Sl. No.	Non-Municipality localities
1	Lawsohtun
2	Mawlai Mawdatbaki
3	Mawlai Nonglum
4	Mawlai Phudmawri
5	Mawpat
6	Nongkhryiem
7	Nongrah

II. Academics

Seven persons from academics, teaching in university and colleges in Shillong were interviewed for the study; including the former Chairman of Khasi Hills Autonomous District Council (KHADC), and a Member of Union Public Service Commission (UPSC).

III. Others

This category comprises of bureaucrats, journalist (media) and activist. In total 10 people were interviewed – which includes officials of Central Ground Water Board (CGWB); Khasi Hills Autonomous District Council (KHADC); Meghalaya Basin Development Authority (MBDA).

Table 1.8: Localities of Shillong City where the Survey was Conducted

Localities In Municipal Area	Localities in Non-Municipal Area
1. Cleve Colony	1. Demthring
2. Forest Colony	2. Golf Links
3. Jaiaw Lansonalane	3. Ishyrwat
4. Jaiaw Lumsyntiew	4. Langkyrding Mihngi
5. Jaiaw Pdeng	5. Lawsohtun
6. Laban	6. Lumdiengsoh
7. Lama Villa	7. Lummawbah
8. Lachumiere	8. Lumshyiap
9. Laitumkhrah	9. Madanrting
10. Lawmali	10. Mawiong
11. Lumdiengjri	11. Mawlai Mawdatbaki
12. Malki Pdengshnong	12. Mawlai Mawroh
13. Mawbah	13. Mawlai Nongmali
14. Mawprem Bishop Falls	14. Mawlai Nonglum
15. Mawprem Lumkshaid	15. Mawlai Nongpathaw
16. Mission Compound	16. Mawlai Nongpdeng
17. Paltan Bazaar	17. Mawlai Syllaikariah
18. Riatsamthiah	18. Mawlai Umshing
19. Umsohsun	19. Mawlai Umthlong
20. Wahingdoh	20. Mawpun
	21. Nongmynsong
	22. Nongthymmai Golden Estate
	23. Nongthymmai Lumiablot
	24. Nongthymmai Springside
	25. Pynthorbah
	26. Rynjah
	27. Umpling
	28. Upper Shillong

1.9 Organisation of the Thesis

The dissertation is divided into six chapters as follows. Chapters I through III are based on literature review and secondary data collected during data collection period for the study. Chapters IV to VI discusses and analyzes the primary data using related literature.

Chapter I: This chapter gives an elaborate review of literature and theoretical perspectives on social sustainability, equity and water governance. This sets the context for the research and also provides the rationale to examine social sustainability in an urban context using the criteria of 'equity' and 'governance'. It is followed by a discussion on the research methods used in this study. Research gaps, rationale of the study and objectives and research questions are given in this chapter.

Chapter II: This chapter gives a vivid account of the study area. Based on existing secondary literature, this chapter provides a general understanding of the physical setting – geography and climate, land and forest, population, community of Meghalaya in general and Shillong in particular. It also provides the condition of water supply systems and associated problems in Shillong.

Chapter III: This chapter provides an extensive review of literature on the traditional institutions of the *dorbar shnongs*. The purpose of this chapter is to examine the history, role, function and the evolution of these institutions. This chapter provides a better understanding and reflects the importance of local traditional institutions as they play an important role in water governance.

Chapter IV: This chapter examines 'equity' in water supply systems both in municipal and non-municpal localities in Shillong. The chapter discusses the findings and analysis of the data garnered from the field.

Chapter V: This chapter deals with water governance exercised by the local traditional institutions chiefly the *dorbar shnongs*. It examines the role of the *dorbar shnongs* in selected localities of Shillong city.

Chapter VI: This chapter summarizes and collates findings of the study thematically. It also provides the limitations of the study and suggestions for practice and policy and the implications of the work for future research. Personal opinion of the researcher is condensed in further discussion combining with related literature suitable for concluding remarks.

The next Chapter 2 provides a vivid account of the study area – the physical/geographical settings, demography, community, and water supply systems of Shillong.

CHAPTER 2

PROFILE OF THE STUDY AREA: SHILLONG AND WATER SUPPLY SYSTEMS

This chapter attempts to understand the nature of the growth of Shillong city and associated problems of water supply through survey of relevant literature. Shillong, like other cities in the developing countries is facing acute drinking water shortages. Shillong city is chosen as a site of study because of the recurrent urban water problems. To set the context for this study, this chapter provides a general understanding of the topography of the Meghalaya state in general and Shillong in particular. The profile of the field site includes population, community, the state of water supply and its associated problems.

2.1 Meghalaya

The state of Meghalaya is located in the hills of eastern sub-Himalayas in the Northeast of India. It is one of the smallest states of the country with a total area of 22,429 km^2. Meghalaya lies between 85.49'and 92.52' east longitude and between 20.1'and 26.5'north latitude. It extends for about 300 km in length and about 100 km in breadth (Sun, 2016). The state has eleven districts – East Garo Hills, East Jaintia Hills, East Khasi Hills, North Garo Hills, Ri Bhoi, South Garo Hills, South West Garo Hills, South West Khasi Hills, West Garo Hills, West Jaintia Hills and West Khasi Hills. Meghalaya is the homeland mainly of the Khasis, the Jaintias and the Garos. The Garos inhabit western Meghalaya, the Khasis in central Meghalaya, and the Jaintias in eastern Meghalaya (Government of Meghalaya, 2015).

Meghalaya is a Sanskrit term meaning 'abode of clouds'. Primarily, this name was given because half of the year—from April-May to September, rain bearing clouds envelope the land (Sun, 2016). The wettest places in the world are also located here (Planning Department, 2010).[4] The state receives an annual rainfall of 12000 mm (470 in) in some areas (Government of Meghalaya, 2015). The western part of the plateau, comprising the Garo Hills region with lower elevations, experiences high temperatures for most of the year.

Meghalaya has a large forest cover, rich biodiversity and numerous water bodies. The state is also well endowed with rich natural resources. The coal reserve in the state is estimated to be about 640 million tonnes. Limestone is another major mineral item found in close proximity to coal. The total estimated reserve of limestone in the state is in the region of 5000 million tonnes. The increased out-turn of products like industrial wood, fuel wood, bamboo, broomstick and *tezpatta*[5] has the potential to transform the rural economy. In the Human Development Index (HDI) of India for the year 2011, Meghalaya is ranked a low 26th.[6]

Meghalaya is primarily a rural-agrarian economy with 79.9 per cent of the population residing in rural areas and around 65.8 per cent of the working population engaging in agricultural and allied activities. *Jhumming* (shifting cultivation) is predominantly still practice in many districts. Although efforts have been made by the Government to wean away *jhumias* from this practice, it continues in certain areas. Though the production of principal crops like rice, maize and wheat reveals increasing

[4] For instance at Sohra (Cherrapunjee), the average annual rainfall is as high as 11,777 millimetres (463.7 in); whereas Mawsynram (the wettest place on earth) has 11,872 millimetres (467.4 in) of rain per annum (Government of Meghalaya, 2015).
[5] The oil from *tezpatta* (cinnamomum tarnata) available in Meghalaya in large quantities contains 70-80 per cent engenol suitable for preparation of perfumery chemicals.
[6] "Meghalaya ranks all India 26th and 7th in NE in HDI". *Meghalaya Times*, December 23, 2011. Accessed March 8, 2017.

trends during the last few years, yet the production of rice which is a staple food of the state is not sufficient to meet the requirement of the state.

Shillong, the capital city of Meghalaya is traditionally known as the 'Scotland of the East' but also characterised as the 'land of abundant wonders' because of its enchanting natural beauty.[7] It has attracted people from different parts of the country and abroad. Accordingly, tourism has now emerged as an industry and both the Government and the local people of various tourist destinations have become conscious of its economic benefits.

In Meghalaya 86 per cent of the population belongs to scheduled tribes, the major tribes being the *Khasis*, *Jaintias* and the *Garos* with their numerous divisions into clans (Nongkynrih, 2014). All the three major communities of the state reckon their descent through the female line. Although 'a unilineal principle of matrilineal descent' is followed by all of them, there are local differences in their functional arrangements. The customary systems of inheritance and landownership found among these communities are intimately associated with the institution of matriliny (Karna, 2009).

The population of Meghalaya according to the 1971 Census was only 1,011,699. Then it rose to 1,335,819 in the 1981 and to 1,774,778 in 1991. According to the census of 2001, the population of Meghalaya is 23,06,069, which were 17,74,778 in 1991. As against the decadal growth rate of 21.34 per cent during 1991 – 2001 at the national level, the population of the State has grown by 29.94 per cent during this period. While the density of population is 103 persons per sq. km, the sex ratio stands at 975 females per 1000 males, which is significantly higher than the national average of 933. The rate of literacy has appreciably grown from 49.10 per cent in 1991 to 63.31 per cent in 2001

[7] Shillong still retains influences of the British in its architecture, lifestyle and language. Shillong is the place where the British moved to after they found Cherapunji too wet. The rolling hills around the town reminded the European settlers of Scotland. Shillong is known as the Scotland of the East for its rolling hills and pine trees that are evergreen (Sun, 2016).

which is of course still below the national average of 65.38 per cent. There is however some difference in the levels of literary among males and females. While the rate of literacy among males is 66.14 per cent, it is only 60.41 per cent among females. In the 2011 Census the population went up to 2,964,007 (males 1,492,668 and females 1,471,339) with a density of 132 per km^2 (Planning Department, 2010). The literacy rate of Meghalaya is 75.48 per cent (Census of India, 2011).

2.2 Introducing the 'Field': Shillong

Shillong is a hill station in the Northeastern part of India and the capital of Meghalaya (see Map 2.1). Shillong is the only major urban centre of the entire state. Out of the state's total urban population of 452,612 persons, as per 2001 Census, the Shillong Urban Agglomeration (SUA) had a population of 267,662 which represented nearly 59 per cent of the state's urban population. It ranks fourth in terms of population among the cities of the Northeast region of India. Out of a total urban population of East Khasi Hills district, nearly 97 per cent are residing in SUA (Government of Meghalaya, 2015).

There are two bodies of local governance in Shillong – traditional (informal) and modern (formal) (Rani, 2016). The present governance system in the Khasi Hills is "a curious mixture of the traditional and the modern" (Syiemlieh, 2006). The urban government in Meghalaya particularly in Shillong takes the form of a municipality, a cantonment board and the *dorbar shnongs*. A large part of the city falls within the jurisdiction of the Khasi Hills Autonomous District Council (KHADC) (Rani, 2016).

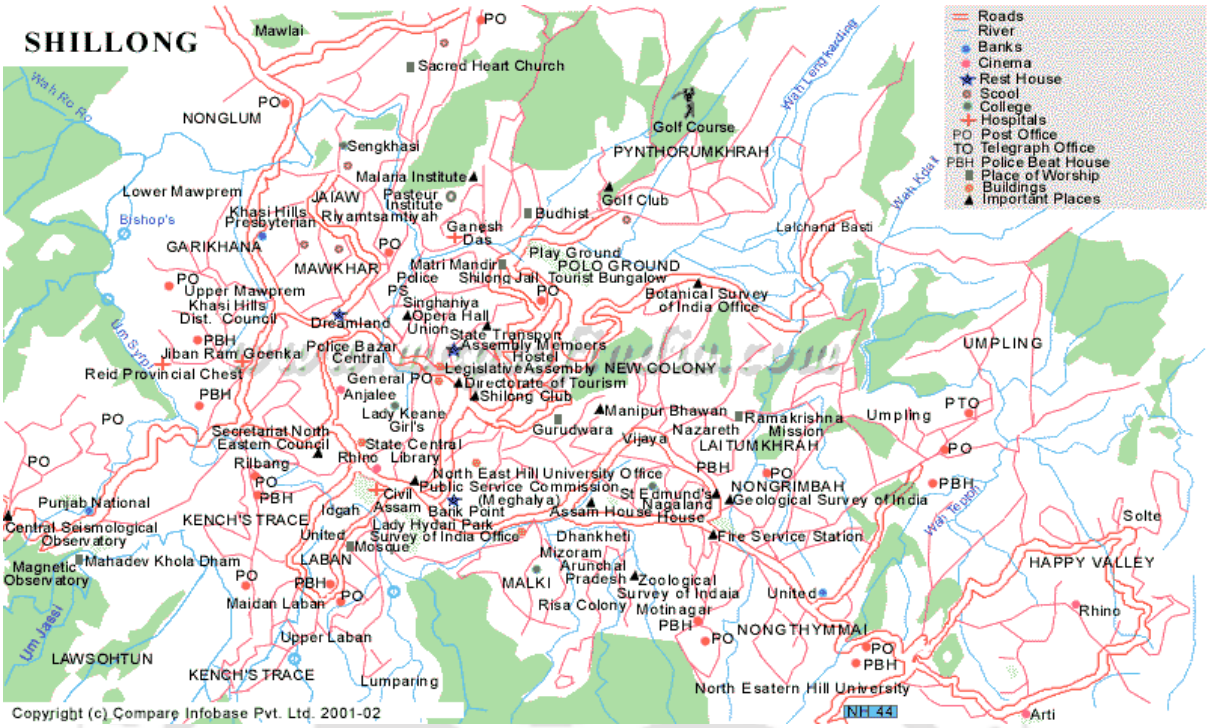
Map 2.1: Map showing the Location of Meghalaya and its Capital Shillong

Source: **https://www.mapsofindia.com (2017)**

Map 2.2: East Khasi Hills District

Source: http://meghalaya.gov.in/

Map 2.3: Shillong City



***Source*: www.indianmaps.com**

Shillong in the Continuum of Urbanisation

Shillong was a small village till it was made the capital of the Khasi and Jaintia Hills District in 1866. Since then Shillong grew and its history of urbanization began. Shillong was made Assam's capital in 1874, remained so till January 1972, following the formation of Meghalaya. Unlike most parts of the country, urbanization in Meghalaya is not associated with industrialization as such but with the growth the expansion of bureaucracy (Rani, 2016). Shillong has a chequered history which goes back to the time of the old Shillong Kingdom, the headquarters of which were at Nongkseh on the South-western vicinity of the town. The old Shillong kingdom was very vast in size, stretches as far as Beltola and Desh Duimria on the plains of Assam in the north and the East Bengal border in the South (Dkhar, 1981).

The city started off with a few scattered huts in the adjoining villages of Laban, Laitumkhrah, Nongkseh and Lawsohtun.[8] The area of Shillong, as it came to being in the second half of the nineteenth century was the habitat of the Khasis who had been living in these hills from time immemorial. The life of the Khasi inhabitants in those early days of settlement was simple. They were mostly a pastoral group and lived in small thatched houses. Shillong's growth began when the new political and administrative set-up demanded the settlement of the British and other European officials in the area. Soon the centre of political gravity was shifted from the plains to the Khasi hills district of Assam (Dkhar, 1981). The growth of the city can also be traced to the establishment of the cantonment by the British in 1867. In 1878, two sub urban villages of Mawkhar and Laban were formed into a station with the consent of the *Syiem* of the Mylliem. Subsequently, Lachumiere and Haneng Umkhrah were included in the station. The station was converted into a municipality in 1910 (ADB, 2009).

The climate of this place suited the foreigners better than any place in the plains of the North Eastern Frontier region. Shillong thus became a much coveted place (Dkhar, 1981). Shillong was originally designed by its founder Col. Henry Hopkins, Commissioner of Assam and agent to the Governor-General of India to be 'a little England' for the British in Eastern India (Kyndiah, 1990).

There was no settled habitation by the name Shillong until the British selected the area for their headquarters (Dkhar, 1981). Shillong derives its name from a peak of the same name, the highest in Meghalaya (6445 ft). There are a few legends surrounding the name of Shillong. One of the legends says that it originated from the name of a handsome youth, *U Shulong*, a supernatural being born in mysterious circumstances, of a virgin human mother (Kyndiah, 1990).

[8] Theses are now localities of the present day city of Shillong.

2.2.1 Geography and Climate

Shillong is the capital of the Meghalaya state and is a popular hill station as it is surrounded by scenic hills and is well-known for its natural beauty (Nongkynrih, 2012). Hence Shillong is an important tourist destination. The city is situated along the northern slopes and foothills of the Shillong Peak 25°34'8.11"N latitude and 91°52'59.27"E longitude at an average altitude of 1496 metres above mean sea level.[9] The city is a part of Shillong plateau which is dissected in nature with well-developed valleys along which the streams flow. The Umshyrpi and Umkhrah rivers, along with their tributaries, flow through Shillong (Tariang, 2011; Government of Meghalaya, 2015).

Shillong experiences a humid sub tropical climate, and is characterized by moderate warm wet summers and cool dry winters. Weather conditions remains pleasant in Shillong throughout the year, with maximum summer temperature of 23° C (73° F) to an average minimum of 4° C (39 °F) during winter. Its climate is pleasant (Sun, 2016). The average annual rainfall is about 2200 millimeters (mm), mostly from the southwest monsoon (Government of Meghalaya, 2015).

Shillong, which was planned by the British as a hill resort, has undergone substantial change (Government of Meghalaya, 2015). Shillong has developed principally as an administrative and commercial centre employing a large number of workers in these sectors (Dkhar, 1981; Lyngdoh, 2015c). The importance of trade and commerce grew simultaneously with the process of urbanization (Gupta, 2003). Shillong due to its location advantage and communication linkages attracted entrepreneurs and commercial activity and is growing as regional commercial centre. Tourism is one of the major contributors to the city's economy (Department of Urban Affairs, 2009).

[9] See http://latitudelongitude.org/in/shillong/ (Accessed on 23 May, 2018).

The seasonal winds, i.e. southwest and northeast monsoon circulation as well as the altitude of the area control the climate of Shillong. The Shillong range has an absolute altitude of about 1800-1900 m above mean sea level and extending in an east west direction across the path of the south west monsoon winds play a significant role in governing the weather condition of the area. Geographically the climate of Shillong can be classified under the humid subtropical climate, characterised by high rainfall mostly during summer. It is characterized by cold dry winters and heavy rains from June-August. Due to Shillong's location on the northern leeward side of the Shillong range it is in the rain shadow zone, thus there is relatively less rainfall than other areas like Cheerapunji and Mawsynram (Hussain, 1984).

2.2.2 Land and Forest

Meghalaya is endowed with rich and luxuriant vegetation cover and is regarded as one of the biodiversity hotspot of the country that supports dense natural forest cover. The natural vegetation of Meghalaya can be divided into three groups:

1. Mixed evergreen forests in the southern parts.
2. The rolling grasslands and the pine forests of the central upland zone.
3. Grasslands with scattered pine trees, which have been observed in the higher altitudes. The hilltops are smooth with shallow sub-soil supporting the growth of several species of grass (Rao, 1968).

In 1933, the vegetation in Shillong cover was around 80 per cent. By the year 1996, the vegetation cover came down to 28 per cent. In 2003 it was reduced to 22 per cent. Today forest cover includes the government protected forests on the northern slopes of Shillong Peak- Kynton Sngi Range also known as Laitkor Protected Forests, Riat Laban Protected Forests, the Upper Shillong Protected Forests and the Riat Khwan

Protected Forests. The vegetation of Shillong can be classified as sub-tropical pine forests and the evergreen forests (Nongkhlaw, 2003).

Land management and control in Meghalaya has historically been different from the rest of the country. The land use system and patterns of landownership is closely linked with social structure and agrarian practices (see table 1 for details). Simply put, land in Meghalaya primarily belongs to the people and is owned by individuals, clans and communities. Land distribution and management is done according to customary practices. Traditional land tenure system in the Khasi Hills classifies land into two main types – *Ri Raid* and *Ri Kynti*. *Ri Raid* or public land belongs to the community and the *Ri kynti* is private lands (Nongkynrih, 2012).

Table 2.1: Land Resources of Shillong

Sl. No.	Land use	Area(km^2)	Percentage to total area (%)
1	Land use	54.94	31.58
2	Developed area	15.73	9.04
3	Underdeveloped area	50.77	29.18
4	Urban agriculture	8.03	4.62
5	Forests and Water bodies	44.51	25.58
	Total Area	174	100.00

***Source*: Directorate of Urban Affairs, Government of Meghalaya (1991)**

The management and control of *ri-raid* which is land belonging to the community is within the jurisdiction of the concerned community. Such lands are normally located at three levels, namely, village (*ri-raid shnong*), a group of villages (*ri-raid Raid*) and a group of villages and Raid (*ri-raid Hima*). A plot of *ri-raid* is allotted to individuals for constructing a dwelling or for cultivation and for other uses. *Ri-Kynti*, which is private land, includes two broader categories: ancestral and self-acquired. While ancestral lands are customarily under the control of the clan and cannot be sold, the self-

acquired lands are under the complete ownership of persons who have acquired them through their own earnings (Karna, 2009).

The current regulations do little more than lay down the primary land control in the hands of the tribal groups. Land tenure system, management and regulations are extremely complex and varied, and the land laws remain uncodified. Land cannot be sold from "tribals" to "non-tribals." Land management and control is single-handedly assigned to the Autonomous District Councils (ADCs). In reality, in the Khasi Hills, for example, three layers of hierarchical institutions coexist: the *Syiem* (the chief), the *Raid* (intermediary level) and the *Dorbar* (local level). All these are under the jurisdiction of the Khasi ADC (Soereide, 2018).

Agriculture

Agriculture is the main stay of the people on which about 75 per cent of the total population still depends for their livelihood. Rice is their staple food (Mukherjee, 2002). The widely prevalent agricultural practice has been shifting cultivation known as *jhum* in the region but a marked transition from shifting to settled cultivation is observed throughout the state. According to one estimate the minimum area under shifting cultivation at one time or the other has been 2650 sq.km in the state involving around 52,200 families (Ministry of Agriculture, 1983). Mixed cropping is widespread in *jhumming* involving both food and cash crops. The major food crops grown in the state are rice, maize and potato. Besides vegetables, all kinds of horticultural crops such as citrus fruits, banana, pineapple, peach, plum etc. are grown in abundance.

Deforestation

The rapid growth of Shillong Urban Agglomeration (SUA) is leading to indiscriminate felling of trees as more forested land is coming under constructional activities. Due to the lack of proper plan and programme coupled with lack of scientific management of the forests, the natural vegetation of Shillong is under threat, which may have a serious repercussion not only on the water supply but also on the ecological balance of the city. The southern part of Shillong is the water shed zone of the Meghalaya plateau.

Shillong is a highly congested area where much of the land is under settlements and roads. It is here that the numerous small streams have disappeared under the stress of urbanization.[10] Due to population growth this area is now occupied by settlements resuting to massive deforestation. Deforestation in this zone is having detrimental effect on the water supply of the Shillong Urban Agglomeration. All the seven Municipal sources of water consisting of natural springs are located here. This area has some reserved forests controlled by the State Government this has restricted deforestation to some extent. This area acts as the source region for Shillong's water supply. The river Umiew has its origin here and flows towards the south to Bangladesh plains. This river is tapped at Mawphalang about 30 km from Shillong proper and supplied to the greater Shillong water supply scheme operating under the Public Health Department, Government of Meghalaya. The total capacity at present of this reservoir at Mawphlang is about 7.5 million gallons of water per day whose total capacity will increase to about 11.3 million gallons (PHED, 2001) per day, i.e., after the completion of the project which was due by 2003 but still incomplete. Hence deforestation due to urban sprawl

[10] For example, Zone II of Shillong – consisting of Lachumiere and Raj Bhavan area situated in the Laitumkhrah-Mawkhar physiographic limit. Due to constructional activities numerous small streams are no longer visible as their beds have been filled up by concrete structures, residential and office buildings.

may decrease the amount of discharge in the streams—which are the sources of supplying water to the Shillong localities.

2.2.3 Population

According to the 1872 Bengal census, Shillong had a population of 1363 (Hunter, 1975). As per the 2011 Census, Shillong (both municipal and non-municipal areas) has inhabitants of over 490,000. The population is projected to grow at a rate of 28.9 per cent. The population of Shillong is projected to be 5.5 lakhs and 7 lakhs by the years 2021 and 2031 respectively (Directorate of Urban Affairs, 1991).

Table 2.2: Population Growth of Shillong (1901-2011)

Year	Population
1901	9,621
1911	13,639
1921	17,203
1931	26,536
1941	38,192
1951	58,512
1961	1,17,483
1971	1,47,170
1981	1.74,703
1991	2,22,273
2001	4,52,612
2011	4,90,000

Source: Nongkhlaw (2003); Census 2011.

The British established Shillong as a hill-station to sustain a few thousand of population only. Over a century, this tiny settlement has grown to a flourishing city and has undergone radical changes from an administrative and resort town to a multi-functional large urban settlement now (Ambikapathy, 2009).

2.2.4 Shillong Municipal Area

Shillong Municipal Board has total administration over 31,025 houses to which it supplies basic amenities like water and sewerage. It is also authorize to impose taxes on properties coming under its jurisdiction. As per the Population Census 2011 data, the following are some relevant facts about population, literacy and religion-wise population of Shillong municipal area (see table 2.3 and 2.4). The total area within the municipal limit is 10.36 km2 which has remained unchanged. The density of population in Shillong is the highest in the municipal area.

Table 2.3: Population with Literacy Rates

Shillong Municipal Area	Total	Male	Female
City Population	1,43,229	70,135	73,094
Literates	1,19,642	59,479	60,163
Average Literacy (%)	92.81%	94.80%	90.92%

Source: Census 2011

Table 2.4: Religion-wise Population of Shillong

Religion	Population (%)
Christian	46.49
Hindu	41.95
Muslim	4.89
Sikh	1.14
Buddhist	0.74
Jain	0.13
Other Religion	4.5
No Religion Specified	0.16

Source: Census 2011

The sex ratio in the municipality area is 1042. Slum dwellers account for 10.09 per cent of total population of Shillong city. The Schedule Tribe (ST) accounts for 51.2 per cent of total population in Shillong.

2.2.5 Shillong Urban Agglomeration (SUA)

As per data released by Government of India for Census 2011, Shillong is an Urban Agglomeration coming under category of Class I Urban Agglomerations/Towns.[11] At present, Shillong is the only Class I city of the state Shillong Metropolitan Areas in SUA are Lawsohtun, Madanrting, Mawlai, Mawpat, Nongkseh, Nongmynsong, Nongthymmai, Pynthorumkhrah, Umlyngka, and Umpling.

Table 2.5: Population and Literacy in SUA

Shillong UA	Total	Male	Female
Population	3,54,759	1,76,725	1,78,034
Literates	2,85,901	1,44,673	1,41,228
Average Literacy (%)	91.37%	93.30%	89.48%

Source: Census, 2011

The literacy rate of Shillong Agglomeration is 91.37 per cent which is higher than national urban average of 85 per cent. Literacy rate in East Khasi Hills was 76.07 per cent in 2001, and 84.70 per cent at present (Planning Department, 2010). The sex ratio in SUA is 1007 females against a national urban average of 926 females per 1000 males. The Schedule Tribe population in SUA account for 72 per cent.

The social fabric of Shillong has undergone great changes owing to large scale migration from rural areas and from outside the state. Apart from the tribes of the Northeast, today we can see many people from all over India residing in the city. The most prominent feature of growing population in Shillong today due to migration of rural poor is the emergence of slums. Slums are found in localities like Polo, Jail Road, Madan Laban, Lumparing, Wahingdoh, Wahthapbru, Lama Villa, Pynthorumkhrah, Jhalupara,

[11] The Census of India has classified towns into six categories on the basis of their population. *Class I* towns and cities are those with a population greater than 1,00,000.

Mawprem and Malki. Most of these localities fall in the municipal area. Also the pace and magnitude of intra state migration has been increasing over the years (Directorate of Urban Affairs, 1991; Nongkhlaw, 2003). As an education hub, Shillong attracts much student population (Lyngdoh, 2015c). As a state capital and commercial centre, labour force is also large. So floating population in Shillong is quite large.

Table 2.6: SUA Localities with Population

Localities	Population
Lawsohtun	8,214
Madanriting	29,194
Mawlai	55,012
Mawpat	6,184
Nongkseh	4,846
Nongmynsong	15,017
Nongthymmai	38,004
Pynthorumkhrah	27,219
Shillong Catonment	11,930
Umlyngka	7,381
Umpling	8,529

Source: Census, 2011

2.2.6 Community

In Shillong the Khasis constitute the majority of the population. There are also other tribal population like the Nagas, Mizos, Kukis and others. The city also supports a sizeable proportion of people of non-tribal origin, most of them being Bengali and migrant Nepalis, Punjabi and Bihari population (Gupta, 2003). The Khasis are an indigenous ethnic group whose society and religion is clan and community oriented (Lyngdoh, 2015c).

The Khasis differ from other tribes of North East India in their language, religion and traditional practices. The Khasis practice matrilineal descent. Children belong to the mother's clan (*kur*). The Khasis follow the matrilineal ultimogeniture system of inheritance of property where the youngest daughter or *Ka Khadduh* inherits the ancestral property. The Khasis also practice matrilocal form of residence (Nongkynrih, 2012). But much of the traditional character has undergone changes due to urbanization (Begum, 1983). The main language spoken is Khasi-Khmer, a branch of the Austroasiatic language family (Lyngdoh, 2015c).

In the course of the colonization of the Indian subcontinent, the westernization of the Khasis began with the arrival of the British and the widespread activities of Christian missionaries. Christianity, westernization, and urbanization have had a huge impact on the social organization of the Khasis (Lyngdoh, 2015c). The majority of the Khasis of Shillong have embraced Christianity. Next to Christian population are the believers of Khasi traditional religion (*Niam Khasi*). There are also a few Khasi Muslims in Shillong (Mukherjee, 2002). There are ethnically exclusive localities in Shillong where only Khasis reside. The Khasi, like other tribes, have their own traditional institutions.

2.2.7 Socio-Cultural Belief and Water

The Khasis' respect for nature is an integral part of their worldview (Deingdoh and Wahlang, 2016). H.O Mawrie in his book *Ka Pyrkhat U Khasi* stated that a Khasi lives with nature and is schooled by nature. Primrose Gatphoh in his work *Ki Umjer Ksiar* considers that Khasis received knowledge and love for one's land from nature. Knowledge is acquired by interacting with nature. Khasis have an eco-theandric view of reality which makes them realize that they should co-exist with every element of nature (Mawrie, 2016). It is in the Khasi custom to believe that the earth is referred to as

Meiramew (which means "mother earth"); Meiramew being a combination of land, forest, rivers and streams (Shangpliang, 2010).

Rivers are always hybrids of nature and culture (Fos, et al., 2017). It is the belief of Khasis that every river, stream or lake has got some sort of fairy or deity guarding its integrity. Water according to the Khasi creation myth is one of the five children of *U Basa and Ka Ramew* (the cosmic couple). It is through the three children *Ka Sngi* (Sun), *Ka Lyer* (Air) and *Ka Um* (Water) that vegetation appeared on the earth. The Khasis value water as God's precious gift to humans. The many rivers found in Khasi-Jaintia Hills have been personified in Khasi folktales. The fact that Lum Shillong (Shillong range) has been perceived as the abode of the chief deity "*U Lei Shillong*" and that three important rivers originate from here indicates the reverence the Khasis give to rivers (Mawrie, 2016).

According to H.O Mawrie, "*U Khasi u im bad ka mariang bad ka mariang ka im bad u*", which literally means, "A Khasi lives with nature and nature lives with him" (Shangpliang, 2010). Khasis speak of *ki khyndai umdih-umtong* (nine sources of drinking water). It is believed that in ancient times there was a kind of lake on the top of *Sohpet-bneng* (Sohpet-bneng peak). The Khasis, who believed that they came down to earth through this peak, were convinced that God himself provided this lake for them. This legendary lake had fresh water in it and it flows out through its nine outlets. The *hynñiewtrep-hynñiewskum* used to collect water from these nine outlets (Mawrie, 2016). Respect for rivers and water sources are still prevalent in most rural areas of Khasi-Jaiñtia Hills (Mawrie, 2016). The affective link to rivers and the appreciation of their value for the spiritual and physical wellbeing is important (Wantzen, et al., 2016). Khasis perceive of mountains and rivers as sacred entities and it has led to an attitude of respect and reverence for these elements of nature (Mawrie, 2016).

A number of streams and rivers flow through the city of Shillong (Jyrwa, 2008). Two main rivers flow through the city namely Wah Umkhrah and Wah Umshyrpi. Umkhrah River, a relatively small river, runs through the heart of the city of Shillong. Small rivers carry purely local and regional meaning. The little rivers possess 'small responsibilities' (Van Dyke, 1903). The Umkhrah derives its name from two words 'Khrud' and 'Rah'. 'khrud' means 'to scrape or erode' and 'rah' means 'to carry or to transport'. Literally, Umkhrah means 'the water that erodes and transport'. Song and poetry have been composed praising this treasured river. Khasi poet, Victor G Bareh (1957), besides glorifying, also emphasized on the phenomenal role of the river in his poem *Ka Wahumkhrah*:

> '*La um jakhlia ia tngit pyrthei, Ha pha ki wan b'an theh kyntei, Pha rong ia ki sha trai duriaw*.' (Free translation: Though turbid waters of the world empty into you, You carry all this to the bottom of the seas).

2.3 The State of Water Supply in Shillong

Shillong is expanding in area and the physical growth of the city is in the northeastern direction, where the new Shillong Township is proposed (ADB, 2009). The new township is located nearly 13 km northeast of the present city. Within the township, there are ten villages viz., Mawdiang-diang, Umroh, Mawlong, Diengiong, Umsawli, Mawkasiang, Madansaisiej, Mawpdang, Siejiong and Tynring (Department of Urban Affairs, 2009). With the rapid growth of urbanization, Shillong now faces shortage of domestic water supply (Dkhar, 1981). Table 2.7 shows the distribution of households by availability of drinking water facility in the district.

Table 2.7: Water Sources of East Khasi Hills

Total No. of Households (Excluding institutional households)	Distribution of households by availability of drinking water facility in East Khasi Hills (%)								
	Tap water			Well			Handpump	Tubewell	Spring
	Total	From related source	From un-related source	Total	Covered well	Uncov-ered well			
538299	39.5	27.8	11.5	25.4	6.9	18.5	2.8	2.6	19.0

Source: **Census of India, 2011**

Most hilly urban areas like Shillong face acute problem of water supply during the dry season. This is because the water supply in most hill towns is by and large governed by seasonal rainfall. Sources of water supply in hills are generally rivers, lakes, springs, natural falls and streams. The water from these sources are fed directly in the piped distribution system and stored in tanks where it is distributed to the consumers through piped water supply (Gupta, 2003).

The Shillong Municipal Board (SMB) and the Public Health and Engineering Department (PHED) provide the bulk of the water supply services in the city. The main water sources are rivers, streams and springs. The SMB controls several springs and stream. In areas beyond the ambit of the municipality, the PHED networks with some traditional institutions to develop small water schemes supplying the water through stand posts and through piped-in-premises. According to the Master Plan of Shillong 1991-2011, the available quantity of water is just sufficient to meet the demand of about fifty per cent of total population of Shillong. The rest of the population depends upon private wells, vendor tankers, small springs, etc. Water supply available to the city is 28.68 mld (million liters per day) as against the demand of 51.70 mld for the year 2006. During the dry season water supply is irregular as it is evident in most parts of the city. The amount of water that the localities receive differs in both quality and quantity (PHED, 2008).

The main water supply project covering the city is the Greater Shillong Water Supply Project (GSWSP) designed to cover the areas under Shillong Urban Agglomeration (SUA) including the Shillong Municipal Board (SMB) and Shillong Cantonment Board (SCB). Phase I of the project whose implementation commenced in the year 1978-79 was completed and commissioned in the year 1986. The source of water supply is the river Umiew at Mawphlang about 30km away from Shillong. Phase II of the project comprises the construction of mass gravity concrete dam of about 130m wide and 50m high across the river Umiew at Mawphlang (PHED, 2008). Phase III is currently being implemented.

2.3.1 Demand and Supply of Water

In Shillong, population projection was made considering the trend of population increase in the past decades. The aim is to increase the per capita water supply level from 2021 onwards so as to attain 150 litres per capita per day (lpcd) by 2031 and 175 lpcd by 2041, in an effort to improved living conditions. Table 2.8 shows the future water demand projected by the PHED.

Table 2.8: Water Demand Projection for Shillong

Sr. No.	Year	Per capita demand	Total demand (MLD)
1	2011	135	57.65
2	2021	135	74.31
3	2031	150	106.4
4	2041	175	160

Source: **Directorate of Urban Affairs, Government of Meghalaya, 1991**

Table 2.9: Details of Performance Indicators for Water of Shillong City

Sl. No.	Description	Details
1	(a) Surface water source capacity *(i) Umiew River reservoir*	9.145Million cubic meter (mcm)
	(ii) Other PHED source	3.64 MLD
	(iii) SMB source	3.27 MLD
	(b) Quantity drawn from surface source	40.96 MLD
2	(a) Ground water source capacity	Not assessed
	(b) Ground water quantity drawn	2.05 MLD
3	Total quantity of water supplied	28.86 MLD (including unaccounted for water due to leakages and evaporation and losses in distribution system)
4	Actual per capita water supplied	65 LPCD (calculation based on population)
5	Treatment plant capacity	40.96 MLD
6	Storage capacity	23.4 Million Litres
7	Distribution network	182.5 Km
8	Distribution coverage	90%
9	Water supply frequency	3-4 hours in morning and similar period in evening (however in some areas supply ranges from 30 minutes to 90 minutes)
10	Water supply facility for public stand post	50% (3-4 hours each in two shifts) 50% (2-3 hours each in two shifts)
11	Average cost incurred for operations and maintenance per year	Rs.8.00 Crore (approx.)
12	Water tax	Not assessed
13	Average leakages (UFW)	50%

Source: **Department of Urban Affairs, Government of Meghalaya, 2007.**

The available quantity of water is just sufficient to meet the demand of about 50% of population of Shillong. The rest of the population depends upon private wells, vendor tankers, springs, etc. The total quantity of water available for supply to the city is 28.68 mld as against demand of 51.70 mld for the year 2006. This reveals that about 70 lpcd is available for supply to the consumers. Considering about 30% losses in distribution from long length of service lines, the actual supply reaches at the consumer's end is 20.08 mld, which is about 50 lpcd (based on total population). The actual position

of supply is however somewhere near about 65-70 lpcd as the newly included areas in the Urban Agglomeration have their own limited supply and not considered in the total availability (Department of Urban Affairs, 2007).

The Table 2.9 in the section above provides a detail picture of the performance indicators of water supply in the city of Shillong (Department of Urban Affairs, 2007).

2.3.2 Major Issues at Present

In November 2017 High Court of Meghalaya has asked Shillong Municipal Board and the Public Health Engineering Department to attend to the deficiencies in water supply in the city. This was its response to a Public Interest Litigation (PIL) which was filed.[12] The lack of adequate water has affected too many of the city residents. Water supply poses a serious problem as major areas of SUA are yet to be covered with organized water supply system. The areas which are covered by Greater Shillong Water Supply Project (GSWSP) have access to organized water supply system and other areas outside coverage of the project depends on other small water supply schemes like deep borewells and other local sources for water supply.

High leakage losses occurred in the consumers' lengthy service lines as well as in the supply tank (see Plate 2.1). The losses in the transmission main and distribution system account to about 55%. Leakage in water distribution systems is an important issue. The need to manage leakage in pipe networks of most of the Shillong municipality became more urgent in recent years due to water shortages caused by recent draughts, increasing the demand along with environmental, social and political pressures.

In general, the available water in rivers, streams and dams including ground water in Meghalaya state as a whole is unsafe for direct consumption. Therefore, it is

[12] See 'HC Asks Government to Solve Water Deficiency', *The Shillong Times*, November 30, 2017. Accessed 20 March 2017.

required to be lifted and transported against considerable head and distance to a place of treatment to make it safe for drinking and thereafter required to be transported again over long distance to consumers in urban areas. For this tremendous amount of electrical energy is required for lifting and transportation of water. In Meghalaya especially, the electricity tariff applicable to water works is the highest in the country. The high cost of electricity charges on public water works has had a direct bearing on cost of production of water (PHED, 2008). The overall objective of a distribution system is to deliver wholesome water to the consumer at adequate residual pressure in sufficient quantity and achieve continuity and maximum coverage at affordable cost.

Plate 2.1: Leaked Pipes in Mawprem 'A means of accessing of water for the poor'!

Source: This photograph was taken by the author during fieldwork, 2016

Loss in treatment plant is reported to be 2.5 per cent and during transmission from treatment plant to main reservoir is 18 per cent totaling 20.5 per cent losses even

before distribution to the consumers. The percentage of UFW, as reported by PHED, for water production and transmission to the zonal reservoirs is exorbitantly high, which calls for serious efforts to detect the source of leakages for this huge quantity of UFW water. Besides, there are losses in distribution. The total UFW is observed to be more than 50 per cent, which is exceptionally high by any standard (Department of Urban Affairs, 2007).

The major issues of the current water supply systems in Shillong are inadequate availability of water supply, antiquated water infrastructure, inadequate financial resources and inefficiency in mobilizing capital by SMB and PHED, absence of integrated approach in service delivery and inability to impose user charges (Department of Urban Affairs, 2007). With the rapid growth of urbanization, Shillong now faces shortage of water, inadequacy of sanitation and other civic services (Dkhar, 1981). The rising populace puts pressure on the natural resources.

The discharge of the main water source i.e. Umiew River has reduced considerably in the past years due to massive deforestation and stone and sand quarrying in the catchment areas. Also the water quality is deteriorating. This could be detrimental in the long run and the yield of the Umiew is bound to reduce substantially. Similar is the position of municipal sources and other sources tapped by PHED in areas outside municipality, many of which are originating from Shillong Peak. The forest covered hills are being encroached upon for space. There is no land policy to protect these areas. More than 90% of the land is owned by private individuals. That means that the government has very little leverage to mandate or regulate the use of resources directly (Ibid.).

The quantity of water has decreased in many of the rivers, the main reasons being deforestation. With the current trend of reduction of discharge of the water sources, the small spring sources are likely to be dried up thus reducing the yield considerably in the

coming decades. Hence there will be more dependence on Umiew River storage. The present storage capacity of 9.145 million cubic metres (mcm) is required to be increased in the coming years.

The objective of the draft Meghalaya Water Policy 2013 is to ensure that "water is used efficiently, shared equitably, managed sustainably, governed transparently and contributes to improving the health and livelihoods of all citizens". The objectives of the Draft Meghalaya Water Act (2012) include,

a) To introduce professional cost recovery operation and preventive maintenance, accountability.
b) To ensure long-term functionality and safety of water infrastructure.
c) To ensure continued and reliable service delivery.
d) To reduce water losses, effluent leakages, and increase water availability for users.
e) To enhance water user participation.
f) To enhance private sector involvement in water service delivery.

2.3.3 Water Supply and the Traditional Institutions

Access to water and the claiming of water rights is often mediated through institutions. Claims to water resources are made and enforced through both formal (PHED, SMB) and informal (customary practices, social relationships, norms of use and access) (Cleaver, Franks, Boesten, and Kiire, 2005). The traditional institutions have an important part in the implementation and operation of the many water schemes in order that the schemes are implemented successfully and to minimize obstacle and for the schemes to provide the intended benefit. The Draft Meghalaya State Water Policy (2013) states that local bodies like the *dorbar shnongs* should particularly be involved in the

operation, maintenance and management of water infrastructures/facilities at appropriate levels, with a view to eventually transfer the management of such facilities to the user groups or local bodies. The draft version of the Meghalaya Water Act (2011) specifies the rights of communities to exercise their access right to water resources, benefit from the management of water resources, play a role in water resource management planning and implementation, be compensated for damaged suffered in relation to water management, obtain information about and to declare objections against water management plans, and file complaints and claims. They also have the duty of ensuring that their water resources are conserved and protecting water infrastructure.

Six *dorbar shnongs* are providing water service on their own and some partner either with the SMB or PHED. Some of the *dorbar shnongs* that provide water wholly on their own are Wahdienglieng, Lumbatngen, Demthring and Lumdiengsoh. Here the source of water is springs. In Wahdienglieng, the supply is for 24 hours and in Lumdiengsoh the supply is for 6 hours. In the rest of *dorbar shnongs*, the supply duration varies from 30 minutes to 90 minutes in a day. And there are the *dorbar shnongs* mainly of the municipality localities which have lesser roles to play in water management but nevertheless important and supporting the supply system. It is these traditional institutions of the Khasis that is one of the main focuses of this study. We will present further detail the role of traditional institution in regards to water supply in Shillong in chapter 5.

In the next chapter, we shall delve into the nature and roles of the institutions and the circumstances surrounding their present state. These local traditional institutions are called the *dorbar shnongs* in Khasi.

CHAPTER 3

TRADITIONAL INSTITUTIONS (*DORBAR SHNONGS*) IN SHILLONG

3.1 Introduction

The Constitution of India, under the provisions of its Sixth Schedule provides a legal framework for the protection of the tribal people of the Northeastern states.[13] They were guided broadly by the following considerations: (a) the exigency of preserving the culture and tradition of the tribal people; (b) the need to provide autonomy in socio-economic and political affairs; and (c) the necessity to prevent their exploitation by the more advanced people of the plains. This provided for the establishment of the Autonomous District Councils (ADCs)[14] in some hill districts of the erstwhile composite state of Assam. In pursuance of this policy, ADCs were constituted in Meghalaya for the United Khasi-Jaintia Hills District and the Garo Hills District in addition to some other districts of the region in 1952. The Khasi-Jaintia Hills Autonomous District Council was subsequently bifurcated on 1st December 1964 when a new council called the Jowai District Council, which was later, renamed as the Jaintia Hills Autonomous District Council was created for administrative expediency. Thus three ADCs have been functioning in the state of Meghalaya for more than five decades.[15]

The District Councils have wide-ranging powers to make laws in respect of subjects like land regulation, management of forest, matters relating to village or town

[13] The Constitution of India makes special provisions for the administration of the tribal dominated areas in four states viz. Assam, Meghalaya, Tripura and Mizoram. As per article 244 and 6th Schedule, these areas are called "*Tribal Areas*", which are technically different from the Scheduled Areas under Fifth Schedule.
[14] The Autonomous District Councils are essentially states in miniature with all three wings of governance, namely, legislature, executive and judiciary.
[15] For details of Autonomous District Councils, see Stuligross (1999).

administration, appointment of Chiefs and Headmen, inheritance of property, marriage and divorce, management of primary education, dispensaries, markets, road and waterways, regulation of trading by non-tribals and money lending and so on. Besides, they have the powers to assess and collect land revenue, impose taxes on professions, trades and employment, vehicles, animals etc. In addition to these sources of income the Councils receive financial assistance from the Government of India under the Award of the Finance Commission through the Government of Meghalaya. The Sixth Schedule further provides an independent three-tier judiciary with powers to undertake cases of both civil and criminal nature. The three tier courts have been established at the village, cluster of villages and district levels for faster redress of disputes based on customary laws and practices as well as codified laws.[16] The Sixth Schedule has provided a comprehensive mechanism for self-governance in the tribal dominated state helping the people to safeguard their customs and practices and preserving their distinct culture and identity.

Another significant turn of event has been the placement of the traditional institutions of chiefs such as *Syiem* under the purview of the ADCs. The powers pertaining to the appointment and succession to these offices have been vested with the council virtually driving the former under the control of the latter. According to the Paragraph 3(g) of the Sixth Schedule, the District Council has been given the power to make laws on the appointment and succession of Chiefs. By virtue of this power the United-Khasi and Jaintia Hills Autonomous District Council passed the United Khasi-Jaintia Hill Autonomous District (Appointment and Succession of Chiefs and Headman) Act, 1959. The Act has laid down the procedure for the election or nomination of Chiefs

[16] The Sixth Schedule has provided a comprehensive mechanism for self-governance in the tribal dominated state helping the people to safeguard their customs and practices and preserving their distinct culture and identity.

and their suspension and removal from the office. In this manner the District Council has thoroughly reduced the position of the *Syiem* and other traditional Chiefs to that of the position of the employee of the Council. Under the condition, the District Councils and the traditional institutions continue to be at odds over power sharing and existence under the Sixth Schedule (Syiemlieh, 1989).

Of late, the umbrella organisation of the traditional Khasi states, the *Federation of Khasi States* have been making various representations to both the State and Union governments to highlight their marginalisation over the decades. The Khasi states are demanding that special provisions should be made in the Constitution of India to recognise, restore and empower these traditional political institutions as guardians of local customs, usages and practices. The traditional tribal values and political practices have not vanished with the democratization, as the chiefs continue to influence the social, economic and political values of the people. In fact, customary laws and traditional political structures of governance actively interact and somewhat interfere with the contemporary structure of governance, which has been shaped by liberal democratic norms and follow the principles of equality and individual liberty along with the rule of law.

This chapter begins by discussing the composition and functioning (powers, functions, responsibilities) of the traditional village council (*dorbar shnong).* The principle of legitimacy and authority is strongly intertwined with the institution of the *dorbar shnong*. Hence, the power relations rooted in the *dorbar shnong* system will be examined here. Authority and law are interrelated since the dorbar shnong or the village/local council is also responsible for interpreting the customary law and settling all disputes within the village and in Khasi society. Customary laws have governed all criminal and civil cases and resolution of disputes within the village. The traditional

governance of Khasi has survived and the fact that customary law continues to be relevant in the presence of modern legal system shows the efficacy in checking crime in the contemporary period in the Khasi villages. Also important are the constitutional provisions that follow a policy of non-interference and allow the Khasi and other tribes of Northeast India to use their customary laws in order to arbitrate internal disputes.

This chapter then discusses the traditional governance system of the Khasis and examines its relevance in post-colonial India. Some of these important legislations have proposed changes in the traditional governance and land system. The interface between traditional institution and the democratic form of governance is a big challenge to the *dorbar shnong* as the former is based on customary laws and the latter is based on formal laws of the Indian Constitution. Despite all these legislations, the *dorbar shnong* continues to play an important role in village or local administration even today.

Before discussing the traditional governance system it is pertinent to conceptually understand power, authority, and legitimacy. Max Weber (Girth and Mills 1964; Weber 1964; Bell 1975; Morrison 1995) has discussed them at length and my analysis is guided by his conceptualization. Weberian theory differentiates between power and authority and delineates three ideal types of legitimate domination or authority. Power can refer to domination by brute force or normative acceptance of it based on persuasion and social sanction. Power is always power over others and it may or may not be accepted to be legitimate by others. When it is sanctioned and acquires social acceptance or legitimacy then it becomes authority. A society is said to be legitimate as long as its institutional orders remain justified to its members. Legitimacy produces the belief that the existing political system is right and most appropriate. It provides the moral propriety to power by transforming it into authority. It is the concern for legitimacy and the perception that authority is legitimate among those who are subject to it (Morrison, 1995).

The three forms of authority conceptualized by Weber are traditional authority, charismatic authority, and rational-legal authority (cf. Girth and Mills, 1964). The first type of political legitimacy, that is, traditional authority, is based on indigenous customs and immemorial traditions. According to Weber (1964), a system of domination can be called 'traditional' if legitimacy is claimed for it and believed in on the basis of the sanctity of order and the attendant powers of control as they have been handed down from the past. The ability and right to rule are passed down often through heredity. This form of authority determines the rule of tribal chiefs, princes and kings. In this kind of regime the essential factor that ensures compliance with the orders and laws of government is personal loyalty to the chief or king or ruling family (Birch, 1993). Here, command and obedience are legitimized on the basis of the sanctity of immemorial traditions which govern the authority relationship. This form of authority is legitimated by the sanctity of tradition and custom, which allegedly or presumably has always existed. This form is most relevant to understanding the political system of the Khasis, both in the past and in the present. The legitimacy of traditional authority thus rests upon the legitimacy of traditional norms. Modernization and western education have not brought about a radical transformation, as far as the traditional values are concerned. In fact, the neo-educated class has strongly advocated the need to preserve the culture or heritage of chieftainship system.

The traditional institutions of governance today they may appear archaic but in practice continue to function with the support of communities to the advantage of the latter and social control. A proper understanding of their structure and function also assumes significance for an attempt is being made by the authority of these institutions for their constitutional recognition in order to harmonise them into the modern system of

governance. The traditional political institutions are essentially based on the age-old tradition and usages.

3.2 *Dorbar Shnong*: Meaning and Concept

The *dorbar shnong* is one of the traditional political institutions of the Khasi people (Lyngdoh, n.d). The *dorbar shnong* is a traditional assembly of all resident adult males under an informal headman elected by them from among their number (Syiemlieh, 1989).

The traditional political structure in Meghalaya is a three-tier system. There are the *shnongs* (villages/localities) at the bottom, the *raids* (provinces/commune) at the middle (regional or provincial level) and the *syiems* (rulers/chiefs) at the top. Each level has a *dorbar* (assembly/council/meeting) comprising of people who are traditionally chosen according to their level of maturity or the sacerdotal functions they are supposed to perform (Baruah, Dev and Sharma, 2005). A *rangbah shnong* headed the *dorbar shnong, lyngdohs or basans* headed the *dorbar raid*, and the *syiem* was the head of the *dorbar hima* (Sharma, 2004).

Conventionally, a *Syiem* is appointed from a pre-ordained royal clan called the *Syiem* clan and heirship to the office of the *Syiem* is in all cases traced through the female offspring. It has been evinced that the office of the *Syiem* "arose out of an impulse for amalgamating identical pursuits, interests and necessities of the clan residents and villages. It was instituted on the spirit of reciprocity along with a consolidation of their intimate relations, which had grown among the different sections of people who made up their units" (Gassah, 2002). The office of the *Syiem* is widely known and it actually represents the core feature of the Khasi traditional political institutions.

In his classical monograph on *The Khasis* Major P.R.T. Gurdon (1975) stated,

> In most states the *Siem* is the religious as well as the secular head, e.g. in the Cherra State, where the *Siem* is also lyngdoh. In Khyrim State the *Siem* has sacerdotal duties to perform at different religious ceremonies, especially at the time of the annual Nongkrem dance ... the *Siem* in matters judicial acts as a judge, the whole body of the durbar being the jury. In the olden days the *Siem* marched to war at the head of his army.

The *Syiem* as a head of the state has traditionally performed numerous functions for the welfare of the people living within the territorial limit of the state. A *Syiem* is always assisted by the *Durbar*, the composition of which of course varies from the state to state.

The traditional Khasi political organization of the *dorbar* can be divided into the following (War, 1998):

- *Ka Dorbar ka Hima Pyllun* (full state Dorbar)
- *Ka Dorbar Raid or Dorbar ki Laiphew Shnong* (*Dorbar* of the Thirty Villages[17])
- *Ka Dorbar Pyllun* is a small council of a group of villages or localities
- *Ka Dorbar Shnong* (village or local *dorbar*)
- *Dorbar Kur* (Clan Council)

In Khasi tradition, the clan, ka kur, is considered to be the oldest institution through which other structures of socio-political organizations emerged. All the adult male members of the clan arrived at decisions through consensus. This system of

[17] 'Thirty Villages' is simply a name given to denote a group of villages larger in number than *Ka Dorbar Pyllun*; it can be more or less than thirty villages/localities in number.

administration concerning related kin groups was later extended to the village (shnong), the commune, (raid), and finally the state (hima) (Lyngdoh, n.d.).

The Khasi traditional concept of *dorbar* (council) is social, political, sacred and divine. So the authority of the *dorbar* depends on both its political authority as an institution and on its sacred and divine authority (Lyngdoh, 2016b). The *dorbar shnong* is the primary unit of administration based at the locality (in the urban areas) or village level (in the rural areas) (Baruah, Dev and Sharma, 2005) and it is ethnocentric and semi-democratic in nature (Lyngdoh, 2016a).

The concept of *dorbar* emerged as an outcome of a social need felt by the community (AusAID, 2005). The concept of *dorbar* is an important part of a Khasi's communal life. The *dorbar* is closely associated with a Khasi—from his hearth to his clan, to his village, commune and even to his state (Lyngdoh, 1952). Every decision taken at the *dorbar* is considered sacred as the *dorbar* is considered to be God's council. The Khasis have accorded reverence for the institution of the *dorbar* (Bacchiarello, 1974).

The traditional *dorbar shnong* was entirely autonomous, since there were no funding or personnel assistance from outside. Today *dorbar shnongs* are still autonomous bodies, with independent decision-making processes and implementations (War, 1998). The traditional institutions are based on customary beliefs, practices and traditions (Planning Department, Government of Meghalaya, 2009).

The Khasi society is universally recognised as having a distinct identity historically and culturally, and its traditional political institutions are also recognised by the Constitution of India through the Sixth Schedule (Lyngdoh, 2016a). The traditional institution of *dorbar shnong* is linked with the modern political institution of the District Council created by the Indian Constitution (Nongkynrih, 2002).

Khasi villages have enjoyed autonomy in the organization and management of their own affairs and have exercised collective control over their resources (natural and human) through the *dorbar shnong*. *Dorbar shnongs* have their jurisdiction over their residents and the natural resources within their territories (Nongkynrih, 2002).

In Meghalaya the *dorbar shnong* is seen as a body outside of the Constitutional framework. The *dorbar shnongs* do not enjoy any legal or constitutional status. Though no constitutional recognition has been accorded to them the people identify themselves with such institutions as they are rooted in society (Nongkynrih, 2015). But Lyngdoh (2015b) opines that the *dorbar shnong* today is not totally unconstitutional. It has an indirect constitutional recognition.

The *dorbar shnong* is a male-centred institution. The Khasis do not conceive the act of attending a *dorbar* as a matter of right but as an imposed responsibility or a compulsion (Lyngdoh, 2016a). The decision-making procedure in the general *dorbar* is usually through negotiations, discussions and deliberation (Baruah, Dev and Sharma, 2005). It is a political institution of the Khasis, by the Khasis, and for the Khasis only (Lyngdoh, 2016a).

The *dorbar shnongs* and their authority fall in line with Weber's (1978) idea of 'traditional legitimacy' where authority is established on and rests on traditional grounds. The *dorbar shnong* has the support of the Khasi inhabitants of the village or locality (Lyngdoh, 2015a). The *dorbar shnong* seem to be most important in the politics affecting the day to day administration and the lives of the people (Baruah, 2004).

Today most *dorbar shnongs* have 'constitutions' that contain rules that are meant to ensure the moral and social stability of the community, which members of the locality must follow, and are usually referred to as the "Ki Adong Shnong" or "Rules of the village/locality" (Baruah, 2005). Residents should abide by these rules. The rules also

have quasi-structured procedures or norms about the scheme of functioning of the traditional institutions (Baruah, Dev and Sharma, 2005). E.g. the *Dorbar Shnong* of Laitumkhrah (a locality in the city of Shillong) has a constitution called "Rules and Regulations Concerning the Administration of Laitumkhrah" which was adopted in March 1990. These rules categorically mention that they aim at maintaining peace and harmony in the locality and are meant to bring about understanding and co-operation among the residents and are binding on all members of the locality (Baruah, 2004).

As stated earlier, the present governance system in the Khasi Hills is a combination of the traditional and the modern elements. Below is a table showing some comparative attributes of the *dorbar shnongs* with other institutions of governance in Meghalaya:

Table 3.1: Assessment of the *Dorbar Shnongs* with other Institutions in Meghalaya

Attributes	Traditional Institutions	Autonomous District Councils	Legislative Assembly
Appointment/Choice of Members	Inherited, selected	Elected	Elected
Date of First Constitution	---	27 June 1952 (UKJHADC)	21 January 1972
Selectors/Electors	Permanent residents, males	Tribal residents and non-tribal permanent residents, adults (over 18 years)	Residents, all adults
Member Attributes	Males, clan affiliation, permanent residents	As above, and adults (25 years)	Residents, adults (25 years)
Periodicity	Varies	5 years	5 years
Juridical Powers to Frame Laws and Rules	Yes	Yes	Yes
Codified Rules	No (except few)	Yes	Yes
Electoral Apparatus	Rare	District Council Affairs Department	Election Commission

***Source*: Rao et al., (2013)**

Lyngdoh (2016a) opines that the *dorbar shnong* is semi-traditional; it is traditional in spirit, but modern in structure and composition. The executive committee of the *dorbar shnong* is a modern governing body bearing a modern name. The traditional concept of *ki tymmen shnong* (village elders) got transformed into that of the executive committee. The functionaries of the executive committee of the *dorbar shnong* like the secretary, treasurer and executive members are all modern inventions to suit new circumstances and requirements in the modern society.

The *dorbar shnong* is a politically neutral village / local council and its office bearers have no collective affiliation to any political party. Thus political parties and party politics have not been able to influence the functioning of the *dorbar shnong* to a large extent (Lyngdoh, n.d). In the *dorbar shnong* there is no question of party politics in the case of elections. The *dorbar shnong* elects the *rangbah shnong* (headman of the village or locality). In many cases if the locality is big, some *rangbah dongs*[18] (area elders or leaders) help the *rangbah shnong*. There are also committee members and other responsible people with duties and responsibilities (War, 1998). The decision-making process in the *dorbar shnong* is that for all practical purposes it is the *rangbah shnong* who performs the quotidian functions of governance. He asserts immense influence that motivates the decisions of the *dorbar* (Baruah, 2005).

3.3 Functions and Responsibilities of the *Dorbar Shnongs*

Dorbar shnongs functions largely on the basis of an unwritten code of conduct though a number of *dorbar shnongs* today also have a set of guidelines (Lyngdoh, n.d). The *rangbah shnong* functions on the principle of collective decision-making. He is assisted by a small executive council, comprising of a council of elders *(*Bakhraw or ki

[18] In modern terminology, they are called Assistant *Rangbah Shnongs*.

Tymmen ki San*)*. The *dorbar shnong* meets at least once in a year to discuss matters concerning the village or it may also meet more often depending on necessity (Lyngdoh, n.d). The powers and functions of the *rangbah shnongs* (headmen) combine executive and judicial powers (Baruah, 2004).

Since most of the *dorbars* are generally without any written constitution, they function in different ways. *Dorbar shnongs* within the municipal area have a different role to that of *dorbar shnongs* located elsewhere. Within the municipal area the Shillong Municipal Board (SMB) has the responsibility of providing the basic services and the *rangbah shnongs* primarily play the role of a representative organisation of the community to liaise with the SMB or the other agencies responsible for the service delivery. The *dorbar shnongs* outside the municipal limits have large variations in their responsibilities (AusAID, 2005).

The state administrative machinery depends on these institutions for a great deal of support - from the traditional heads of the *himas* to the *rangbah shnongs*. Interaction and dependence of the KHADC and the SMB has increased with these traditional institutions (Syiemlieh, 2006). The SMB has, in many ways, failed to effectively execute all its mandated responsibilities. Some of these especially the civic responsibilities are being executed by the *dorbar shnongs*. This tacit relationship is acceptable to all concerned parties (the people, the SMB and the state government) so long as the services are rendered. Although the Meghalaya Municipal Act, 1973 does not legally recognize *dorbar shnongs,* many of the civic responsibilities are executed by them (Lyngdoh, n.d.).

Also, the civil administration of the government appears to have accepted that the *dorbar shnong* is the legitimate law-enforcing authority (Lyngdoh, 2016a). But, as mentioned earlier, these traditional authorities have no constitutional power whatsoever and function on the basis of customary laws and practices, and traditions based on the

goodwill of the people. Therefore, any judgment passed by them on issues – related to land or otherwise – is technically not binding in a court of law (Nongkynrih, 2014).

The *dorbar shnongs* are fast becoming formalized by acting as an arm of the state government. They are fast losing their traditional, non-formal character and are acquiring an authority of unprecedented formal nature through *de facto* jurisdiction. They play an important role in bringing an ethnocentric perception to administration at the local level (Baruah, 2004).

The major functions of *dorbar shnongs* both in rural and urban areas are indicated as follow:

1. The primary functions of the *dorbar shnong* are to maintain peace and tranquility (Lyngdoh, n.d). The *dorbar shnong* is quite efficient and effective in the maintenance of peace, and law and order in the village or locality (Lyngdoh, 2015b).
2. The *dorbar shnong* performs specific judicial functions and arbitrates minor local crimes and functions as a prosecuting body (Baruah, 2005). They also functions as local courts to try petty cases as land squabbles, fights, divorces, boundary disputes, petty thefts etc. (War, 1998). Minor cases of civil disputes and crimes were effectively solved at the level of the *dorbar shnong* itself, and very few cases decided by the executive committee of the *dorbar shnong* are disputed by the litigants and appealed to higher authorities (Lyngdoh, 2016a).
3. The *rangbah shnong* also exercises executive and law-enforcing functions within the locality/village. Crimes are reported to the *rangbah shnong* first who then decides based on the nature of the crimes whether to report

them to the police or take action. The other executive functions of the *rangbah shnong* include granting of permission for construction, purchase of property or organizing fetes in the village (Baruah, Dev and Sharma 2005).

Developmental works such as the construction and maintenance of roads, bridges, water sources, sanitation etc. and providing and maintaining civic amenities to its residents are a primary function of the *dorbar shnong*. These include construction and maintenance of small roads, footpaths, street lighting, drainage and sewage system and waste disposal (War, 1998; Lyngdoh, n.d). The role of the *dorbar shnong* as the administrative functionary of the government's at the village level with regards to health service, education, census enumeration, election processes, crime detection, and developmental services (Lyngdoh, 2015b). They are also engaged in many welfare works like the practice of periodic *pynkhuid shnong* (cleaning the village/locality) (War, 1998).

Further, some of the power and functions of the *dorbar shnongs* are discussed as under:

1. Each *dorbar shnong* can levy contributions and duties from households and markets within its jurisdictions, to meet their expenses (War, 1998). Different rates of fees are collected for allowing residents to buy property and to forward applications for trading licenses by the non-tribal traders (Baruah, 2004). Other kinds of fees are also collected, e.g. vehicle parking fees.
2. Many villages or localities own some community land e.g. *khlaw shnong* (village or community forests). Usually those forests have water sources,

streams etc. Localities can also have *ki khyndew shnong* (village or locality land) which are used for various activities (War, 1998).

3. Many *dorbar shnongs* promotes youth development activities through the seng samla, the youth organization of the locality (Lyngdoh, n.d) besides other activities.
4. It serves as a sort of watchdog to check the illegal immigration (Kharbudon, 2015).
5. The extent of social cohesion in the village is centered on the proper functioning of the *dorbar shnong* (Lyngdoh, 2015b).

Nowadays, especially in the urban setting some of the functions of the *dorbar shnong* have been modified to suit the needs and contexts. In several areas the *dorbar shnong* work together with government agencies/functionaries and NGO's e.g., for obtaining and maintaining drinking water supply (War, 1998). The *dorbar shnong* is usually approached to implement other government programmes like adult literacy and non-formal education and public distribution system (PDS).[19] The *dorbar shnong* acts as a developmental and administrative agency of the state government. The *dorbar shnong* voluntarily plays the government's administrative functions at the locality level in matters concerning maintenance of law and order; and civic welfare administration with regard to all the items of collective interest. The *rangbah shnongs* and members of the *dorbar shnong* committees do not receive any payment or honorarium for fulfilling these responsibilities (Lyngdoh, 2016a).

With the growth of localities and increasing number of households especially in the case of urban areas, many of the *dorbar shnongs* have been divided into smaller sub-

[19] Public distribution system is a government-sponsored chain of shops entrusted with the work of distributing basic food and non-food commodities to the needy sections of the society at very cheap prices.

localities called *dongs*. Each *dong* is headed by *rangbah dong* (assistant headman). The *dorbar shnong* within the SMB area has an apex body called the *Synjuk ki Rangbah Shnong* or the federation of *dorbar shnong*. The role of this federation is primarily to pursue the agenda or the city level issues common to all the *dorbars* with the government (AusAID, 2005).

In general, the *dorbar shnong* is efficient in meeting the day to day requirements of Khasi society at the grassroots level. It has also played a significant role as a legitimate organ of the government in the implementing of various development programs and in maintaining law and order (Lyngdoh, 2016a).The *dorbar shnong* works hand in glove with the government to bring overall development through various schemes as well as maintaining law and order by working together with the police when the need arises (Laloo, 2014).

In the midst of all this, the traditional institutions of the *dorbar shnongs* are sometimes blamed as being barriers to development and improved service delivery. On the other hand formal institutions have also been charged with hampering development. They have been charges with inability to respond to local needs (Meghalaya Institute of Governance, n. d.). Critics of the *dorbar shnongs* claim that these institutions are an exclusivist and extend an ineffective form of rule that ought to end. They stress that the headman usually lack skills and resources required for increasingly bureaucratic and complex urban administration and various other infrastructural arrangements that need to be in place. Another problem is a lack of transparency, which critics claim enables corruption (Karlsson, 2017). There are strong reservations to the continuation of traditional institutions when there are newer forms of governance that guarantee equality before the law, women rights and stand for accountability (Syiemlieh, 2006). These

institutions are also presently being criticized as ones that have no or little utility (Kharbani, 2016).

Linkage between the government and the people is provided and can be improved by these grassroots institutions. But instead of acting as a vital bridge between community and the administration the *dorbars* are spearheading confrontation with the state government. This has produced governance of confrontation instead of governance through cooperation. Confusion has been the outcome and the victim of such inequity, as always, is the common man (Blah, 2016). *Dorbar shnongs* today have lost focus of their mandate to provide basic fundamental services to the community they serve. Blah asked an important question- "are the *dorbars* providing governance which is in tune with the needs of our times?" (Blah, 2016).

In the following section, two main criticisms largely cited in existing literature against the *dorbar shnongs* will be briefly discussed. These drawbacks are also the prominent subjects of contemporary debate outside academia.

3.4 The *Dorbar Shnong* and Women

A Khasi system of beliefs states that *ka said ka thew, ka saiñ ka tiah, kiba khia kiba shon ka jong u rangbah*, that is, deliberations and decisions, planning, administration and policies and the burdens of management belong to the man. Another tenet states, *ka wait, u sum, ka sang, ka barshi, ka kñia ka khriam baroh ka jong u rangbah. Ka kynthei tang ka lum ka kynshew, ka taiar ka dah ka dang*, that is, the weapons of war and the sacerdotal performance belong to the man. The woman is thus regarded to be the keeper of the home and the one who prepares and collects the things connected with the rituals (Lyngdoh, n.d).

Traditionally the Khasis believes that "war and politics is for men" and this can be clearly seen especially in the traditional system where men dominate in the political administration (Laloo, 2014). Furthermore, according to Lyngdoh (2016a), it was not that Khasi women were disallowed from attending public *dorbars* but it was unnecessary for them to do so as it was solely for their own interests that their uncles were attending the public *dorbars*. Also the Khasi trational *dorbar* was charged by the presence of spirits to which a man would not like his sisters or nieces to be exposed to. Khatso (2004) reiterates that tradition is the excuse cited for debarment of women from these local institutions.

Before independence, the British followed a policy of allowing the hill tribes of the area of the then province of Assam to govern themselves according to their customs and traditions. The tribal areas were kept isolated from the rest of the country and outside the purview of laws enacted by the provincial legislature (Umdor, n.d.). But after independence many changes took place. The British did not recognise the sanctity of the *dorbar* (council). The coming of Christianity and western idea of separating religious from the secular hampered the religious importance of the institutions (Kharbani, 2016).

Christianity brought with it a male-oriented value system, and the new education and British rule further strengthened that system. The tradition of keeping women out of public bodies seems to be a new tradition that was perhaps invented as recently as the late nineteenth or early twentieth century (Sharma, 2004). According to a report of Captain R. B. Pemberton in 1835, women took important decisions in the public sphere of Khasi administration. But later they were politically marginalized (see Sharma, 2004).

A visible change has occurred in urban-centred localities. Women in many localities in Shillong attend *dorbar* and are also included in the executive committees of the *dorbar shnong*. Laitumkhrah, Nongrim Hills and Lachumiere *dorbars* include

women in their executive committees. There are also some women organizations such as *ka seng kynthei* (women's organizations) in various localities which send representatives to the executive committee of the *dorbar* or local council (Khatso, 2004). In the past the *dorbar shnong* practices male suffrage but now women also take part (War, 1998).

Besides the issue of gender discrimination, there are other pressing issues presently concerning the *dorbar shnongs*. One major concern is undemocratic practices.

3.5 Democracy and the *Dorbar Shnongs*

According to historian Helen Giri (1998) democracy, to the Khasis, is the ideal; shaped, molded and brought into structure by the ancestors and that they had been able to preserve and maintain their democratic way of life. British colonial official Captain D. Herbert (1903) also writes, "The Khasis are a singularly progressive and intelligent race with democratic tendencies."

Moreover, War (1998) is of the opinion that the *dorbar shnongs* arising out of needs at the grassroot level had from times immemorial placed power with the people. The traditional administrative thinking has been guided by a social value system founded on principles of social justice (*kamai ia ka hok, tip briew- tip Blei*). Today, there is a degeneration of these principles. In its place, exploitative qualities for power, money and corruption has now taken root in the socio-political system (Blah, 2013).

At present, urban localities represent a pluralist population. However, communities other than the Khasi are debarred from attending meetings of the *dorbar shnong*, having no say in the affairs of the *shnong*, where decisions arrived at 'in their interest' are dictated upon them (Lyngdoh, n.d). It is generally accepted and believed that a non-Khasi can never understand the concept of a Khasi *dorbar*.[20]

[20] As told to me by a former *rangbah shnong* of the Umsohsun locality (Interviewed on 12th June 2016).

In the name of safeguarding tradition, some *rangbah shnong*s misused their powers and position and some have even acted like dictators. There have been many cases where people were banished, stigmatized and ostracized by the *dorbar*. Some were denied ration cards and other benefits because they protested against some acts of the *dorbar shnongs*. Cases have also been reported where children were not allowed to attend school because their parent did not comply with the *dorbar*'s directive (Mohrmen, 2015). Sometimes "*rangbah shnongs* behave as if they are running an independent state of their own" (Ibid).

Khasi democracy was not completely representative either. The original clans who played a crucial role in the emergence of the *shnong* enjoyed exclusive privileges. These clans were represented in the *dorbar shnong* and from among them were chosen the *rangbah shnongs* whose office in due course became hereditary and lifetime. These clans came to represent little oligarchies thus wielding unsurpassed power (Lyngdoh, n.d). In the city of Shillong this is still witnessed in localities like Mawpat and Nongrah where only members of particular clans can become a *rangbah shnong* (Laloo, 2014).

Other flaws are also in existent. For instance, the income and expenditure of the *dorbar shnongs* and the *rangbah shnong* are not subject to financial audit thereby leaving this vast area of financial accountability open to manipulation and misappropriation. In some villages or localities *dorbars* are not held at regular intervals in many *shnongs* thereby denying the Khasi residents the opportunity to put forward their grievances and suggestions (Lyngdoh, n.d).

But there are positive changes taking place. One good example is that, in many localities, the *rangbah shnong* is no longer a clan based, hereditary and permanent representative of the locality but is today a term based elected representative. Another positive change is that residents (including Khasi women) who attend *dorbars* speak

freely at such meetings and also raise important matters concerning their village or locality (Lyngdoh, n.d).

Modern constitutional devices and values have invaded and caused influential changes. The presence of a written constitution, presentation of reports, election of functionaries and the constitution of the executive are indication Modern democratic governance has influenced and impacted these traditional political institutions and the socio-political dynamics and state of affairs. Traditional un-codified sets of rules are no longer adequate (Baruah, Dev and Sharma, 2005), and there is a paradigm shift towards modern participatory democracy (Lyngdoh, 2016a).

3.6 The KHADC and the *Dorbar Shnongs*

The rationale behind the Autonomous District Councils (ADCs) was to set up a system of local administration to give greater autonomy to tribal societies, to preserve and safeguard tribal groups' traditional practices and to act as a 'mesoinstitutional' linkage between the state government and informal grassroots tribal institutions (Meghalaya Institute of Governance, n. d.). The Constitution makers saw the necessity to maintain the distinct and unique customs, socio-economic and political culture of the tribal people of the region to allow the tribal people to develop and administer themselves according to their own genius (Karna, Gassah and Thomas, 1998). Independent India followed the colonial traditions of valuing tribal autonomy by protecting the state under the Sixth Schedule of the Constitution (Upadhyaya and Upadhyaya, 2016).

The idea behind the Sixth Schedule was to provide the tribal people with a simple and inexpensive administration of their own (Karna, Gassah and Thomas, 1998). The preservation of smaller culturally defined states like Meghalaya has made it possible for

the elected representatives of indigenous peoples to access control over policy making and administration. However, this has also posed a challenge for the traditional institutions to bring the necessary adjustments in order to engage positively with state-based institutions and fulfill the obligations of democratic governance (Upadhyaya and Upadhyaya, 2016). The Sixth Schedule grants self-governing autonomy to tribal communities in Meghalaya. It formally acknowledges the full jurisdiction of tribal communities over land and natural resources (see Oberlack, Walter, Schmerbeck, and Tiwari, 2015). It is the function of the District Councils to conserve the dynamics of tradition (Lyngdoh, 2014).

The main problem today in the governance system is the existence of two parallel systems of administration – one mandated by the provisions of the Constitution of India and the other by the sanctity of tradition. Where the constitutional system of administration fails to execute its civic responsibilities, the traditional political institution fills the lacuna (Lyngdoh, n.d). Lyngdoh (2013) identified two deficiencies relating to the Sixth Schedule: i) establishment of village councils is not mandatory in the Sixth Schedule areas, where they exist (like the *dorbar shnong*), do not have constitutional protection for election on the basis of universal adult suffrage and tenure ii) there is no constitutional provision for reservation for women in the district council and the traditional institutions.

There is a growing concern among civil societies that the Khasi Hills Autonomous District Coucil (KHADC) is not effective but that it it obstructs development instead. Many are of the opinion that ADCs should be abolished[21]. Rani (2014) also agrees that ADCs seem to interfere rather than manage and maintain the traditional institutions. The KHADC has not frame rules for the effective functioning of

[21] Interview with Patricia Mukhim, Editor of *The Shillong Times* (An English daily newspaper based in Shillong) (Interviewed on 16 April, 2016).

the *dorbar shnongs* except for the appointment and succession and judicial functions of the *rangbah shnong* (Lyngdoh, n.d). The KHADC has miserably failed to empower such traditional institutions in the entire process of governance (Borkotoky, 2014).

The Sixth Schedule has relegated the traditional heads to a subordinate position, turning them into agents of the district councils. The fundamental cause of conflict is that the Councils which are modern institutions based on western democracy are being implanted to preserve the traditional institutions in Meghalaya. Furthermore there seems to be more politicking among Members of District Councils (MDCs) in the district councils and little focus on issues mandate to the council (Buam, 2015). There is an overlap of authority and a conflict of interest between the state government and the district councils (Karlsson, 2005). There is a governance deficit at the level of the institutions as none of the institutions, namely, the state government, the District Councils and the traditional institutions (here, the *dorbar shnongs*) are able to perform to their fullest potential in contributing to the governance (Borkotoky, 2014).

On the one hand, the state government stands for modern democratic system, and the KHADC stands for indigenous traditional system, on the other. However, both serve the needs and interests of the same people and same territorial area. This simultaneous existence of these different systems of governance concerning the same people and the same territory has brought about institutional dissonance in Meghalaya (Lyngdoh, 2015b).

Joshi (2004) also opines that there are real and potential tensions between the state and the traditional grassroot institutions. The grassroots indigenous institutions in Meghalaya have felt threatened by state interference and modernization. The principles of individual liberty, the rule of law and the expectation of competitive politics come directly in conflict with traditional values of tribal life, implying group assertion, kin-

protection and collective effort. With the dawn of independence and with the setting up of ADCs, the period of an erosion of democracy in the area begins. Such new political institutions (ADCs) were in fact eroding the powers and functions of traditional councils instead of improving them (Gassah, 2002). The introduction of the District Councils has brought about to mistrust and misuse of power by the newer form of administration (Syiemlieh, 2006). Their functions have been curtailed or taken away (Gassah, 2016). Hence the relationship between the traditional *dorbar shnongs* and the KHADC has not been very advantageous.

The emergence of the ADCs has caused a sense of confusion among the people in general, and a feeling of uncertainty, if not of mistrust or suspicion, among the chiefs of the motive of the District Council as to their continuance as custodians and trustees of the customs and traditions of the people. Such new political institutions which were created after independence were in fact eroding the powers and functions of traditional councils instead of improving them. The traditional chiefs never welcomed the District Council because it threatens the powers and functions of the chiefs and it appears to be alien to the traditional institutions (Gassah, 2002). In the opinion of P. A. Sangma, the initial concept of having an autonomous body was because the major tribal groups namely Khasi, Jaintia, and Garo were minorities within Assam. After attaining statehood, the District Councils have become irrelevant (Rani, 2014).

3.7 *Dorbar Shnongs* as Institutions of Local Self Government: The Way Forward

The governance of the *dorbar shnong* in a village or locality today is perceived to be a new grassroots governance institution evolving out of the amalgamation of the Khasi clan-based democracy and the individual-based modern popular democracy (Lyngdoh, 2016c). The representatives of traditional institutions claim historical

legitimacy. The representatives of the constitutional bodies, while not directly questioning the validity of the traditional institutions, talk of a situation where traditional institutions can contribute more effectively to governance if they are ready to accommodate change (Sharma, 2004). According to most traditional institution leaders, *dorbar shnongs* represent a superior form of governance, free from the deceitfulness of modern party politics (Karlsson, 2005). The *dorbar shnong* has the support of the Khasi inhabitants of the village or locality as a spontaneous social authority that emerged from within and not imposed from outside the society. So as far as the Khasi society is concerned, the *dorbar shnong* is sociologically legitimate, though it is not fully democratic (Lyngdoh, 2015a). The *dorbar shnong* is a very powerful social institution even without any constitutional or legislative support (AusAID, 2005). The traditional institutions by themselves have been playing a very important role in the development process in the Khasi Hills (Borkotoky, 2014).

Essentially, the state of Meghalaya is experiencing a complex governance structure. The responsibility of governance and service delivery falls under the ambit of three centres of authority: (i) the State; (ii) the Autonomous District Councils; and, (iii) grassroots indigenous traditional institutions (MBDA, n.d.). The state has been unable to come up with any legal paradigm which will introduce the element and concept of good governance at the grassroots level (KHADC, n.d.). For meaningful coexistence it is important to streamline the practices of the *dorbar shnongs* and to eliminate the discrepancies. Overlapping jurisdictions between the three-layered governance in Meghalaya has to be eliminated (Upadhyaya and Upadhyaya, 2016). Restructuring and streamlining the traditional institutions is necessary to bring them at par with other democratic grassroots institutions in India (KHADC, n.d.).

For instance, one of the often-cited difficulties in resolving the anomalies and contradictions between the traditional institutions and non-traditional institutions is the lack of understanding about their respective roles as well as their responsibilities towards each other (Upadhyaya and Upadhyaya, 2016). A trustful relationship and a sensitive approach are missing. E.g. the traditional institutions were not consulted by the state on the Forest Right Act (2012), which delegitimized the rights of indigenous people to their traditional habitat. Many experts observed that it was, as always, a top-down imposition (Upadhyaya and Upadhyaya, 2016). In recent years some control over the traditional institutions has been attempted by the state government (War, 1998).

As a society, committed to the traditional principles of ka *tipbriew-tipblei* (conscientiousness) and, *ban kamai ia ka hok* (to earn righteousness and justice), it is currently advisable that there should be a review of the present customary practices of the traditional governance institutions in the Khasi Hills. Only traditional customs that legitimately serve the need of the society at large should be kept (Lyngdoh, 2014). Two important tasks are to be performed simultaneously - to protect the cultural identities of the tribal groups as provided in the Sixth Schedule and to build up equitable, transparent and responsible democratic governance at the grassroots according to the present requirements of the modern democratic society (Lyngdoh, 2016a).

Voices for a renewal of the traditional institutions in Meghalaya, and increased authority vis-à-vis other tiers of government, have been turning into a political movement in the state (Andervad, 2014). Today the office of the *syiem* and the *hima* are but skeletal relics. The local *dorbar* is perhaps the only traditional institution with any resemblance of traditional governance left, but even here drastic steps are needed to make it pertinent to community needs for the 21st century (Blah, 2013).

Democratic transformations can accommodate gender justice in the *dorbar shnong* and make it more adjustable to the requirements of non-Khasi communities permanently residing in the villages and urban localities. Democratic decentralization of local self-government in the Khasi society would be practical and efficient if it is carried out through the institution of the *dorbar shnong* with necessary improvements in its constitution and procedures. More positive democratic elements should be introduced in the constitution and functioning of the *dorbar shnong* to suit the present needs of Khasi society as well as for democratic justice (Lyngdoh, 2016a). These traditional institutions are still relevant and play an important role in local governance and administration in Meghalaya (Rani, 2014).

3.8 Discussion

It is evident from the discussion that the notion of *dorbar shnongs* still exists in the minds of the participants and sometimes is "shared as implicit knowledge rather than in an explicit and written form" (Ostrom, 2010). At present there is a resurgence of the rights and powers and privileges of the traditional institutions (Syiemlieh, 2006). The main threat to these grassroots traditional institutions is not from advancing modernity or from new and emerging trends in developmental administration. The main threat is from the belief that tradition is carved in stone (Blah, 2013).

Nevertheless, the *dorbar shnongs* may be functioning and strong but they are not on an equal footing in terms of their control, influence, contribution to people's welfare, and recognition as modern political institutions (Rao, Bhasin, Barua, Anand, Pandey and Srinivasan, 2013). The revival of traditional institutions is complex and socially significant (Karlsson, 2005). Institutions that don't know what it is to be accountable in little things cannot be responsible with more powers over larger issues

(Mukhim, 2014). Instead of preserving static and dead customs (Lyngdoh, 2014), the KHADC can reform the *dorbar shnong* in a manner befitting today's state of affairs. As aptly remarked "progressive society Khasis should not cite tradition as a pretext for avoiding change when it is necessary" (Mukhim, 2008). It is increasingly felt that necessary changes in the grassroots administration are needed (Lyngdoh, 2015b).

Interviews conducted for this study indicates that these institutions, despite the historical moorings, transition and shortcomings, are of immense importance to the Khasis way of life. Taking away these institutions would essentially mean to do away with the identity, value and unity of the Khasi people. The attributes of these institutions define the character of their indigeneity of the Khasi Hills. The intricacies revolving around this debate is to make sweeping changes to these institutions and also the whole traditional administrative system. An extensive discussion of the roles and functions of the traditional institutions in the context of water governance will be provided later in Chapter 5.

In this chapter, attempts have been made to understand the *dorbar shnongs* institutions—chiefly their structure, roles, challenges and future possibilities. This is occupies an important crux for this study because these local traditional institutions are the central object of investigation here.

The next chapter will examine the water supply access and distribution patterns in Shillong. From here, we will get a better understanding of the present situation of domestic water in terms of equity. Because the *dorbar shnongs* are one of the institutions that are responsible for water governance, the current circumstances of household water supply partly reflect on the nature and conduct of these institutions.

CHAPTER 4

EXAMINING 'EQUITY' IN WATER SUPPLY SYSTEMS IN SHILLONG

4.1 Measuring Water Equity?

As discussed in Chapter 1, the literature survey has shown that there are many principles and frameworks for measuring water equity. Like social sustainability, water equity can be measured or evaluated using a number of principles and indicators. For example, Phansalkar (2007) offers ways of measuring equity by taking into account the social and gender aspects. According to the WHO and UNICEF (2015), equity occurs when the water is obtained from 'improved' sources (see Table 4.1). Recent research has utilized the basic principles of human rights to develop an equity index (Kayser, Moriarty, Fonseca and Bartram, 2013). The UN (2012) provides dimensions of equitable access dimensions like access by vulnerable or marginalized groups and affordability for users. General Comment No. 15 of The Right to Water adopted by the UN Committee on Economic, Social and Cultural Rights (2003) provides three factors for water adequacy that applies in all circumstances – availability, quality and accessibility (physical accessibility, economic accessibility and non-discrimination). In 2008 and 2009, the International Water and Sanitation Centre (IRC), The Hague developed a water service ladder based on categorizations of four indicators: quantity, quality, accessibility and reliability (see Table 4.1).

Table 4.1: IRC Water Service Delivery Ladder Framework

Service Level	Quantity (litres / capita / day)	Quality	Accessibility (minutes / round trip	Reliability	Status
High	Greater than 60	Meets or exceeds national norms, based on regular testing	Less than 10	Very reliable: works all of the time	**Improved**
Intermediate	40-59	Acceptable user perception and meets/exceeds national norms, based on occasional testing	10-30	Reliable / secure: works most of the time	
Basic	20-39				
Sub-standard	5-19	Negative user perception and / or no testing	30-60	Problematic: suffers breakdowns and slow response time to repairs	**Unimproved**
No service improve-ment	Less than 5	Fails to meet national norms	Greater than 60	Unreliable / Insecure: completely broken down	

Source: **Kayser, Moriarty, Fonseca and Bartram (2013)**

This chapter examines equity in water supply systems in Shillong. At the outset it must be noted that this study focuses on domestic water aspects both in the municipal and non-municipal areas. Also, this chapter looks at the present nature of water supply, the quantum and quality, the distribution pattern and the intra-generational equity in Shillong. Relying on the aforementioned inputs or indicators such as – quantity, quality, accessibility and reliability, this chapter will examine equity in water supply. However,

with regards to quantity, since it was difficult to measure water quantity or volume (in metric unit of litre) for this study, the duration of water supply is taken as a measure of quantity instead. With regards to the quality of water, user perception is mainly taken as a measure of the water quality. Quality is examined superficially through subjective feedback of water consumers. For other inputs, scattered references will be made which depends on the available primary data collected.

4.2 Sources of Water

The main sources of water supply in the municipal area are shown in Table 4.2. In the municipality localities more than 80 per cent of the households are dependent with piped water on premises. The rest relies on public standpipes (see Plate 4.1). Only a negligible percentage of households (1.5%) are reliant on both sources i.e., piped water on premises and public standpipes simultaneously to meet their domestic water requirements. Purchasing is another way of obtaining water in this area but this means is used only during seasons of water shortage. Here, for the households with piped water on premises, water is mostly supplied by the SMB, whereas the PHED supplements the water supply.

Table 4.2: Main Sources of Water Supply in the Municipality Localities

Water Sources	**Households (%)**
Piped water on premises	81
Public standpipes	17.5
Both	1.5

***Source*: Field Study 2016**

Plate 4.1: A Public Standpipe in Lawsohtun Locality

Source: Photograph taken by the author during fieldwork, 2016

The main sources of water supplies in the non-municipality localities households are piped water on premises, public standpipes, rivulets/streams and springs, wells and buying (see Table 4.3). This wide range of water sources has a direct bearing on quantity and accessibility. A large proportion of 14.4 per cent of the households relies on purchasing water for their daily domestic purposes. Compared to 81 per cent of households which are connected to a water network in the municipal area, only 34 per cent have piped water on premises in the larger and expanding non-municipal area. A significant percentage of 17.7 per cent rely on more than one source of water.

Table 4.3: Main Sources of Water Supply in the Non-Municipality Localities

Water Sources	Households (%)
Piped water on premises	34
Public standpipes	24.7
Buying	14.4
Rivulets/streams and springs	6.2
Wells	3
Piped water on premises and public standpipes	5.15
Public standpipes and buying	4.4
Piped water on premises and wells	3
More than two sources	5.15

Source: **Field Study 2016**

Plate 4.2: A Community Spring in Mawlai Mawdatbaki

Source: Photograph taken by the author during fieldwork, 2016

The study reveals that households in non-municipality localities depend on other water sources besides piped water on premises and public standpipes. Springs and streams are common water sources in many parts of the city (see Plate 4.2). But during winter, most are without water or water flow is very low and hence insufficient to meet required water needs. A significant proportion of 5.15 per cent of households depend on more than one sources to meet their daily water requirements.

4.3 Quantity

To comprehend the quantity input, only piped water on premises and public standpipes is taken into consideration for this study. During the study, it was not conducive to measure diurnal quantity of water from sources like springs and water vendors. Therefore a comparison is made among selected localities with respect to the duration of water supply i.e. the number of hours per day for piped water on premises and public standpipes (as shown in Tables 4.4 and 4.5). It depicts clear differences within and across the municipal and the non-municipal areas. These tables show data of selected localities only from the field survey conducted.

Based on the findings of the study the average daily water supply in the municipal area is 6.67 hours, in the non-municipal area it is only 3.4 hours for piped water on premises. The maximum duration of water supply in the municipal and non-municipal areas is between twenty-four hours and six hours respectively. For instance, in municipality locality like Jaiaw Lumsyntiew, water supply is for a trifling two hours only in a day. In the non-municipal area, the lowest duration of water supply is recorded from Rynjah locality—which is thirty-five minutes per day only. The vast range of differences of water being supplied to the households is evident from the data is shown in Table 4.4 below.

Table 4.4: Duration of Water Supply for Piped Water on Premises in Some Selected Localities

Municipal/ Non Municipal Area	Locality	Water Supply (hr/day)
Municipal Area	Jaiaw Lumsyntiew	2
	Umsohsun	4
	Mission Compound	4
	Kharmalki	4
	Lama Villa	4
	Mawbah	4
	Mawprem Bishop Falls	4
	Jaiaw Shyiap	6
	Madan Laban	24
	Lawmali Pyllun	24
	Cleve Colony	24
Non-Municipal Area	Rynjah	35 min
	Langkyrding Mihngi	45 min
	Golf Links	45 min
	Mawlai Mawdatbaki	1
	Madanrting	1
	Pynthorbah	1
	Mawlai Nonglum	1
	Mawlai Mawroh	2
	Lumshyiap	2
	Mawiong	3
	Upper Shillong Third Mile	3
	Lummawbah Parmaw	5
	Nongthymmai Golden Estate	5
	Lawsohtun	6

Source: **Field Study 2016**

Comparatively, the extent of differences in the duration of water supply is lesser between the public standpipes and piped water on premises for two localities, namely Riatsamthiah and Umsohsun. The maximum duration of water supply is seen to be six hours in both the localities (Riatsamthiah and Umsohsun). From the study, it is interesting to note that none of the localities in the non-municipal area obtain water supply of not more than three hours per day. The lowest duration noted is of two hours per day recorded in five of the six localities given in Table 4.5 below. The maximum duration in the non-municipal area is recorded in the locality of Lummawbah which is three hours per day.

Table 4.5: Duration of Water Supply for Public Standpipes in Some Selected Localities

Municiapl/Non-municiapl Area	Locality	Water Supply (hrs/day)
Municipal	Riatsamthiah	6
	Umsohsun	6
	Jaiaw Shyiap	5
	Mawprem Dymmiew	4
	Lumdienjri	4
Non-municipal	Lummawbah	3
	Nongthymmai Nongshiliang	2
	Mawroh	2
	Mawlai Mawdatbaki	2
	Mawpat	2
	Nongmynsong	2

Source: **Field Study 2016**

In the municipal area 93 per cent of the households with piped water on premises obtain water everyday. For the rest it varies from 4-5 days in a week. Whereas in non-municipal areas, 64 per cent get water everyday, 10 per cent for 5-6 days and another 26 per cent less than 3 days in a week. The study found out that in the non-municipality localities, where the *dorbars shnongs* involved in water schemes, water is supplied through piped on premises and public standpipes on a daily basis. On the other hand a 'pure' PHED water connection does not guarantee daily supply. For public standpipes, water supply is daily in both the municipality and non-municipality localities.

Respondents were also asked if the water supplies i.e. quantity is enough to meet daily household water needs, in which 100 per cent in the municipality localities responded "yes". Whereas, in the non-municipality localities, 42 per cent said that the water supply received by their households is "enough" and 58 per cent responded "no", i.e. it is not enough to meet daily household water needs.

4.3.1 Levels of Satisfaction with Water Quantity

The levels of satisfaction of both piped water on premises and public standpipes are given in Table 4.6. The data analysis indicates the level of feeling of satisfaction of the people. The study has taken "quantity" as an indicator and its objective to meet basic household needs.

The data in Table 4.6 shows that the level of satisfaction is higher in the municipal area because they receive more quantity of water. From the table above we can see that around 62 per cent of the respondents are satisfied with the quantity of water they receive either from piped water on premises or public standpipes or both. A relatively large percentage responded likewise for the non-municipality area.

Table 4.6: Levels of Satisfaction of the Respondents with Water Quantity

Levels of Satisfaction with Water Quantity among Respondents	Municipality Localities (%)	Non- municipality Localities (%)
Very satisfied	6.7	1.6
Satisfied	62.7	50
Not satisfied	30.6	45.7
Not at all satisfied	0	2.7

***Source*: Field Study 2016**

Within the municipal area, the ones who respond as "very satisfied" are not the ones who get more than 7 hours of water a day but are the ones who get below 3 hours of water in a day. This is because 3 hours of water in a day is more than enough since water is stored in water tanks and can be used any time as per requirement. For those receiving more than 7 hours a day, the water supply might not be regular (i.e. getting water supply on a daily basis), they have to share the water from public standpipes with other households and/or variations in the flow or discharge of the amount of water. In the non-municipal areas people receive a lesser amount of water and the supply too is irregular in majority of the localities. Hence, the levels of satisfaction are low. The study has also recorded that only in the non-municipality localities the respondents have retorts "not at all satisfied".

A number of selected localities corresponding with the responses of their respective residents (respondents) are shown in Table 4.7. No overlapping of responses occurred for these localities.

Table 4.7: Localities and Levels of Satisfaction with Water Quantity

Levels of Satisfaction with Water Quantity among Respondents	Municipality Localities	Non-municipality Localities
Very satisfied	Umsohsun, Jaiaw Lansonalane	Demthring, Mawlai Nonglum
Satisfied	Wahingdoh, Mission Compound	Mawlai Nongpathaw, Mawpun Golf Links, Pynthorbah
Not satisfied	Cleve Colony, Laitumkhrah	Lummawbah, Kenchs Trace, Ishyrwat
Not at all satisfied	Laban	Rynjah Lumshngain, Nongthymmai

***Source*: Field Study 2016**

4.4 Water Quality

Generally, water requirement for personal or domestic consumption must be clean, safe and should be of an acceptable colour, odour and taste. However, throughout the study, the respondents utterly stated that the water obtained from the different sources is not safe for direct consumption (drinking). Therefore, it requires further treatment like boiling or filtering.

Water sources as 'improved' and 'unimproved' is categorised by the Joint Monitoring Programme of the UNICEF and WHO in 2004 (see Table 4.8). This division can be juxtaposed with Table 4.2 and Table 4.3 to obtain the required information of examining water equity in terms of quality. In the municipal area, most of the water comes from 'improved' drinking water sources whereas in the non-municipal area, most households attain water from 'unimproved' drinking water sources. Bottled water was

not included in the survey, as it recorded zero responses during pre-testing of the questionnaire.

Table 4.8: 'Improved' and 'unimproved' sources of water

Sources of Water	
'Improved' water sources	**'Unimproved' water sources**
Household connection	Unprotected dug well
Public standpipe/tap	Unprotected spring
Own borehole/tubewell	River, pond, etc. (surface water)
Protected duh well	Vendor-provided water
Protected spring	Bottled water
Rainwater connection	Tanker-truck water

***Source*: WHO and UNICEF (2004)**

Again, in 2017 the Joint Monitoring Programme of the UNICEF and WHO provided a new updated and expanded classification where a domestic drinking water 'ladder' for household water services is given. The highest rung of this ladder[22] is 'safely managed' drinking water where water is from an "improved water source" which is located on premises, available when needed and free from faecal and priority chemical contamination. If this benchmark is used against the present data for this study, the percentages of households using "improved water source" will decrease further even in the municipal area. In this case all public standpipes and spring will no longer be regarded as 'improved'. The 'available when needed' criterion / criteria is / are not clear. In majority of the localities in Shillong, water is not supplied around the clock. But if water is obtained whenever needed from a storage facility, then it subsequently falls within the safely managed water service.

[22] Below the ladder of 'safely managed' criterion are 'basic', 'limited', 'unimproved' and 'no service'.

As evident from the study, improved sources include piped water, public standpipes and private borewells. There are many borewells that serve as local sources for localities like Jaiaw Laitdom, Pynthorumkhrah and Lumshyiap. Others include protected spring and protected dug wells. Some of the springs in the city are tapped by the PHED, as a consequence of which they are protected. In Lawjynriew and Madanrting localities there are springs that are the local sources of water under PHED. Also there are dug wells in many places and it is assumed that they are protected since they are individually / privately owned.

Unimproved sources of drinking water include tanker trucks, unprotected dug wells, unprotected springs and surface water. In the city water shortages has constrained many households to resort to buying of water. On a closer examination, the quality of such water is questionable.

Further, a comparative analysis of the satisfaction levels of the respondents with water quality between the municipal and non-municipal areas of Shillong for piped water on premises and public standpipes is shown in Table 4.9. Like in the case for "quantity" criterion, quality of water is also better in the municipal area. Overall 39 per cent of the respondents were 'satisfied' with the quality of the water in the municipality localities and only 5 per cent were 'very satisfied'. In the non-municipal area, altogether 63 per cent were 'not satisfied' and quite a large share of 10.5 per cent was 'not at all satisfied'.

In the non-municipal area, water quality differs widely from one locality to another. Water quality differs because of the different water sources and the distribution infrastructure. Water sources include borewells, rivers, springs and the Mawphlang Dam. The quality of underground water differs from one locality to another. Water obtained from rivers is usually not of good quality due to unavoidable pollution. By the time the water from Mawphlang Dam reaches the people, after traversing great distances, its

quality as well as quantity has decreased. Spring water is usually the most acceptable water in terms of quality. Spring water originating from the hills around Shillong Peak contributes the highest amount of water distributed in the municipal area.

4.4.1 Levels of Satisfaction with Water Quality

In the municipal area, a large share of 51 per cent responded as "not satisfied" with the water quality. This was further explored through interviews. Since water sources varies for both the SMB and the PHED supply water in the municipality localities. In municipality localities, water quality is generally similar but there are exceptions. Interviews with people in municipality locality of Laban have revealed that people prefer SMB supplied water to PHED water. According to the interviewees, water supplied by the PHED is muddy red in colour, whereas SMB water is clear. During the rainy season, even SMB water is muddy in most localities making it difficult for consumption. Hence, it is observed that the levels of dissatisfaction with water quality are enormous in the municipal areas. The levels of satisfaction with water quality both in the municipal and non-municipal localities are shown in Table 4.9.

Table 4.9: Levels of Satisfaction with Water Quality

Levels of Satisfaction with Water Quality among Respondents	Municipal Localities (%)	Non-municipal Localities (%)
Very satisfied	5	5.3
Satisfied	39	21.2
Not satisfied	51	63
Not at all satisfied	5	10.5

***Source*: Field Study 2016**

Remarkably, the 5.3 per cent of the non-municipal area who responded as "very satisfied" are households in whose localities water is being managed wholly or jointly by the respective *dorbar shnongs*.

A number of selected localities corresponding with the responses of their respective residents (respondents) levels of satisfaction with water quality are shown in Table 4.10.

Table 4.10: Localities and Levels of Satisfaction with Water Quality

Levels of Satisfaction with Water Quality among Respondents	Municipality Localities	Non- municipality Localities
Very satisfied	Umsohsun, Jaiaw Pdeng	Lawsohtun, Lumdiengsoh
Satisfied	Wahingdoh, Mission Compound	Mawlai Nongkwar, Mawlai Umthlong
Not satisfied	Laitumkhrah, Lachumiere	Umpling Dongsharum, Mawlai Syllaikariah and Nongmynsong
Not at all satisfied	Laban	Umpling Dongsharum

***Source*: Field Study 2016**

4.5 Accessibility

Accessibility to water is measured in many ways. Yet, in this study, we use chiefly three indicators that are – collection time, obtaining new water connections and cost to measured water accessibility.

4.5.1 Collection Time

In the municipal area water is easily accessible. There have been improvements in recent years. As people mostly depend on piped water on premises and public standpipes, accessibility is easy. For instance, all public standpipes are within a walking distance of less than two minutes. And the average walking distance is less than one

minute. Number of public standpipes is more in the municipality localities and the housing is more compact here, which lessens the distance from house to source.

The time taken to collect water is more in the non-municipality localities compared with the municipality localities. Collection time vary widely when it comes to other sources of water like streams and springs in the non-municipal area. From the interviews with residents in Mawpat and Nongmynsong (two residents from each locality were interviewed), the time taken for round trips can be more than thirty minutes.[23] People also had to travel longer distances for washing their clothes. Typically a resident in Mawpat sometimes even uses a vehicle because the stream is too far from her house.[24] Table 4.11 below shows the time it takes to collect water from public standpipes, springs and streams for respondents in the non-municipality areas. Here we see 45 per cent of the respondents take about five minutes to collect water. Basically this pertains to public standpipes. The 15-30 minutes of roundtrips taken to collect water includes springs as well. Most of the people are reluctant to collect water if collections time is more than 15 minutes. In such a situation, they resort to purchasing water.

Table 4.11: Water collection time in the non-municipal area for public standpipes

Collection Time	**Respondents (%)**
About 5 minutes	45
About 15 minutes	39
About 30 minutes	15
More than 30 minutes	1

***Source*: Field Study 2016**

[23] Interviews were held with two residents each from these two localities.
[24] Interview held on 7th June 2016.

In localities like Madanrting and Nongmynsong, the hilly topography contributes to longer collection time taken to collect water from springs. The physical strain is also high. Moreover, it is difficult for women and children to obtain water from such locations.

4.5.2 Water Connection

The process of obtaining water connection is also simple in the municipality localities. A household can either choose between the SMB and the PHED for connections. Whereas, obtaining a house water connection is a harrowing experience in non-municipality localities like Mawroh and Mawpat. The duration of waiting for water connection is long, it can take years! One resident of Mawpat told the researcher that he had applied for a water connection to the PHED five years ago.[25] It has yet to materialize. Simultaneously, there are extreme cases where house water connections are not even available in localities like Nongrah and parts of Mawlai Mawroh. Thus, households do not have the option to apply for piped water on premises. For instance, in Nongrah locality no household has water connections. The only available connections are provided by means of a small private water network for selected few households on the payment of exorbitant price ranging from rupees one thousand two hundred per month (Rs. 1200/month).

In the non municipal area, water access is comparatively difficult for piped water on premises and public standpipes. Here only the PHED water connection is available. In some localities, *dorbar shnong* connections (PHED with *dorbar shnong* assisted water schemes) are there. Water connection is easier with a *dorbar shnong* water scheme for reasons like size of area governed, community bond and small population.

[25] Interview held on 3rd June 2016.

4.5.3 Buying and Cost of Water

In the municipal areas water tax is included in the municipal property tax that residents pay annually. The amount per annum is around five thousand rupees. Notably, 16 per cent of the respondents in the municipal area are not aware as to whether they pay such tax for water or not. One of the main reasons is that the revenue on water is marginal. And people's general idea and their attitude about water are apathetic. The question of water affordability does not arise in the municipal are because everyone has to pay taxes (inclusive of water taxes).

In the non municipal areas, the water cost that residents pay to the PHED vary from one locality to another depending on the water source, cost of extracting the water, kind of water infrastructure, etc. The costs in water in some selected localities of the non-municipality areas are given in Table 4.12. The data collected from these localities reveals that the highest cost they pay for piped water on premises is rupees 270 per month (in the locality of Madanrting). Here, mention may be made that when we talk about cost, it is only households who possess their own respective houses that get water connections and hence pay the water fees. While those who do not pay water fees are the ones that inhabit rented houses.

Localities pay different water charges per month and accordingly water quantity varies too. For instance, there are households that get water five times a week while some get twice a week only. So in terms of "cost" in the non-municipal areas, its contribution to an equitable water supply is quite unimpressive. Connection fees are also high in the non-municipal area owing to greater distances from the main pipes.

Table 4.12: Water fees in the Non-Municipal Area for Piped Water on Premises

Locality	Water Supply Cost for piped water on premises (Rupees per month)
Lummawbah	70
Mawlai Nongpdeng	194
Pynthor	194
Umpling	200
Nongthymmai Golden Estate	260
Madanrting	270

***Source*: Field Study 2016**

Buying of water is main source of water for many households in the city of Shillong in the non-municipal area. The average cost of water is rupees three hundred per one thousand litres (Rs. 300/1000lt). There are also individual vendors who deliver smaller quantities of water either using pushcarts or carrying the water by oneself. The price is an average of thirty rupees for about 20-25 litres of water (see Plate 4.3). In localities like Nongmynsong and Nongrah, the majority of households depend on water vendors (mobile water tankers or by a single person using water containers) to deliver water. Poor and rich households alike heavily depend on water vendors in a number of non-municipality localities. During winter when demand is high, people have to wait for almost two to three days for water to be delivered. Some do not even get water delivered to them. Non-networked water supplies upon which a large proportion of urban households depend are entirely unregulated in the city of Shillong. Absence of regulation by the formal and informal authorities means water pricing, quality and delivery remains unchecked. Usually during the months from March to April every year there is acute

water shortage. Therefore, households even in some localities of the municipal area resort to buying water.

Plate 4.3: Water Containers Used to Deliver Water by Water Vendors

***Source*: Photograph taken by the author in Mawlai Phudmawri, fieldwork 2016**

4.6 Reliability

According to Majuru, Suhrcke and Hunter (2018), reliability is measured by the functionality of the water supply system itself and the extent to which it meets the needs of water users. Regarding the reliability of meeting needs, the data pertaining to quantity in the earlier sections can be correlated with the feature of water reliability.

Comparatively, in the municipal area water supply is more reliable. Major breakdowns of water infrastructure are rare. Minor problems like breakage of small water pipes, are handled by the water consumers themselves by employing the services of local plumbers. In case of public standpipes too, water supply is regular. In case of

any problem, the timely response to repair is speedy. In general, water supply services are 'improved' in nature and the reliability is high and secure in municipal areas.

In the non-municipal area, there are associated problems such as reliability of water supply. The problem differs from locality to locality depending on a number of factors. For instance, the residents in Mawlai Mawdatbaki expressed that their water-related complaints are often not heard or that the response time is sluggish. Also in Mawpat and Nongmynsong, there are public standpipes that are completely broken down. Contrarily, water supply in Lawsohtun and Nongkhryiem is highly reliable. Even water services provided by the respective *dorbar shnongs* is greatly reliable. Further detail as to how these two localities have maintained water equity will be discussed in Chapter 5.

S. S. Syiem, editor of the Khasi daily newspaper *U Peitngor* held the view that it is very surprising that the water infrastructure set up by the British in the present municipal area of Shillong are still functioning and being used today.[26] In other words, the water supply in this area is reliable partly because of the robust water infrastructure which is still dependable in optimizing water supply. Whereas, the post-British water infrastructure are found to be less reliable.

For piped water on premises, breakdown occurs due to wear and tear mainly because water pipes flows through drains (see Plate 4.4) or breakage caused by vehicles running over the pipes or water theft which results in the tampering of the pipes. For public standpipes, breakdown can occur due to the same reasons besides others that disrupt water supply. But the main issue in this case is the time taken to repair the broken down water infrastructure. There are cases where weeks are taken to repair or fix the broken public standpipes. Nevertheless, there are also cases where repair is quick and

[26] Interview held on 3rd September 2016.

prompt. The latter usually happens when a particular *dorbar shnong* is effective in its work. The breakdown of main water infrastructure like big water pipes is uncommon. When it occurs, the SMB or the PHED respond and solve such issues.

Plate 4.4: Water pipes running along drains are a common sight in Shillong.

Source: **Photograph taken by the author in Paltan Bazaar, fieldwork, 2016.**

Table 4.13: Reliability of water supply for piped water on premises and public standpipes

Reliability of Water Supply Responses of Respondents	Municipal Localities (%)	Non- municipal Localities (%)
Very good	22	6
Good	57.4	34
Satisfactory	9.6	44.4
Bad	11	15.6

Source**: Field Study 2016**

The respondents view concerning the reliability levels both for piped water on premises and public standpipes in both the municipal and the non-municipal areas are given in Table 4.13. The data indicates that the municipality localities have a more reliable water supply where 57.4 per cent responded to the reliability as 'good' and 19 per cent as 'very good'. And another 44.4 per cent of the respondents in the non-municipal area responded the reliability of water supply as 'satisfactory'.

4.7 Other Measures of Equity

Besides quantity, quality, accessibility and reliability, other measures like gender equity, social equity, and seasonal and geographical variations shall be discussed in the following section in measuring water equity.

4.7.1 Gender Equity

Usually, in water sources such as public standpipes and surface water like springs and streams, the collection are done by adult male members. Both in the municipal and non-municipal areas such households account for 64 per cent. This was also confirmed by observation method employed by the researcher. It was observed that young adult men are usually the ones collecting water from public standpipes. An interesting observation was made among the Khasis that it was more of the adult males who collect water. However, in areas like Paltan Bazaar, Nongmynsong and Sweepers Lane (among the non-Khasi and non-tribal residents), it was observed that it was the adult women who were generally engaged mostly in collecting water. The researcher cannot confirm the latter observations. Generally, it was observed that the washing of clothes in springs and streams / rivers is done solely by women (see Plate 4.5).

Plate 4.5: **Women Washing Clothes in the Locality of Nongrah**

Source: **Photograph taken by author during fieldwork, 2016.**

4.7.2 Social Equity

In in the course of the field study no forms of discrimination were experienced by any of the localities, as belonging to a social groups or community do not determined their access to water. The water authorities (SMB, PHED and *dorbar shnongs*) do not discriminate on such criteria in providing water. During the interview, when the respondents were asked as to whether they experience any kind of "favouritism" in terms of supply of water, 86 per cent of the respondents responded "No". However, for those whose responses were "Yes", explanation was sought and through which it was learnt that comparatively economically better-off household could get water connections quickly compared to other applicants. Also, it was found that the rich usually bribe plumbers to channel or divert more water to their households. So the respondents with "Yes" responses can be interpreted as favouritism in the light of rich-poor divide, i.e. economically disadvantaged and affluent households.

In terms of control, the study point out that private ownership of land dictates in some form by influencing and controlling the use of water. This creates dependencies on those who 'own' and sell/give water. The next Chapter 5 will provide a better understanding of the interplay between land ownership and water rights.

4.7.3 Seasonal and Geographical Variations

The study reveals that overall 98 per cent of the respondents had mentioned the prevalence of seasonal variations of water supply. Seasonal variations usually occur during the months of March and April after dry winter spells. During this period, the duration of water supply is reduced and therefore water supply becomes intermittent in many localities across the city. Notably, almost all the water authorities do not have any water shortage mitigation measures. There is a huge dependence on mobile water tankers/water vendors. Such seasonal discontinuity compels households to look for other alternative sources of water.

Geographical variations occur due to the presence or absence of water sources like springs and groundwater in the vicinities. Groundwater is not accessible in every neigbourhood. Shillong being a hilly city, the topography of the land is not uniform, which determines the retention and flow of groundwater. This factor can also be interpreted as being a determinant in variations in terms of water equity across the city. For example, Shyiap locality does not have any water sources like springs or rivers within its geographical area or nearby. On the other hand, Mawlai Phudmawri which is located near a forest, the residents have access to a number of springs.

In the subsequent sections we discuss how water and poverty is interrelated for which access of water by vulnerable groups of selected slum dwellers will be examined.

4.8 Water Equity and the Poor

In order to understand how water and poverty is interrelated in terms of access of water, the study identified the poor residents using two indicators – employment / income and housing characteristics. Street vendors were chosen for interviews for the former indicator and houses with poor physical conditions or poor housing (Baker and Schuler, 2004; Marlier and Atkinson, 2010) for the later indicator. Besides these two indicators, interviews were also conducted with slum dwellers.

The household survey indicated that many poor families in the city have to spend a substantial amount of their income on purchasing water for domestic purposes. On the other hand wealthier households with a networked connection receive water at a lower cost per unit volume, spending lower proportions of income for much greater quantities of water. Levels of water consumption are positively correlated with wealth in the non-municipal area and a few pockets of the municipal area.

An interview was conducted with twenty-two individuals and families categorized as "poor" which include street vendors who are located around the city and households members. Random and snowball sampling was used for street vendor identification.

The following sections comprise of cases of the experiences shared by the poor households both from the municipality and non-municipality localities. The cases presented in the following section are a compilation of the interview and narratives in the course of the fieldwork. The study was conducted to substantiate the findings regarding water (in)equity in Shillong.

4.8.1 Municipal Area

1. In a slum in Paltan Bazaar, twelve Nepali households get their water through unconventional means. A plumber illegally provides water by 'stealing' it from a main pipe and channeling this water to the premises. Moreover, the plumber sells the water at the rate of two hundred rupees per month (Rs. 200/month). The water is sufficient for these twelve households, however no conflict have been experienced over the water supply. Water is stored in small containers and buckets in their congested houses. Sometimes there would be no water for many days and the nearest public tap is at a distance. If water problems occur, they approach a particular person who then acts as mediator between them and the plumber. They are happy with the present state of water. Paltan Bazaar is in the municipal area. The households do not obtain water from the SMB water network but in an unauthorized and unethical process which amounts to erroneous theft of water. The residents were not willing to reveal the identity of their water 'hero'! Eventually, for them what matters most is getting their supply of water.
2. Another locality adjacent to Paltan Bazaar is Qualpatty. Here poor households have no water problems. They all have water connection in the premises with an average supply of six hours a day. Another slum called Sweepers colony, on the other hand has a deplorable water supply. Every household here collects water from broken pipes. When it rains, rain water is harvested. Sometimes water is purchased. Since the households in this locality do not buy water on a regular basis, often times the water vendors would disregard their request for water as they are not a regular customer. To add to their woes, the landlord lives far away in another locality and is unconcerned regarding water provision.

3. In Jaiaw Laitdom the landlord provides water for Aiti. She is a house-maid. She lives with another friend and shares the rent. Even during the periods of water shortage, the landlord purchases the water for all the tenants. So water is always sufficient. "*I am satisfied with the water supply. The landlord is kind*", said Mem of Jaiaw Laitdom.[27]

4.8.2 Non-Municipal Area

1. In Saw Mer Shiteng there is a public tap which dispenses water day and night. This water is rationed to nearby households by turns. Each household connects a plastic pipe for three hours per day. The pipe is connected from the tap to the house. They pay thirty rupees per month to the *dorbar shnong*. According to them, the *dorbar shnong* is discharging good service. A resident of Saw Mer states,

   "*Water is sufficient for my household. It is sufficient for all of us. There is understanding and unity among all the households who collect water from this public standpipe. Our dorbar shnong is doing a good job in providing us water.*"[28]

2. In Nongmynsong four people were interviewed each from different households and these are the highlights:

a) Mr. A and his family members spend four to five hundred rupees per week in purchasing water because all that his household can collect is one bucket of water in a day from the nearest public standpipe. There is a spring relatively far away and none of the household members have the time to collect the water. When

[27] Interviewed on 21st June 2016.
[28] Interviewed on 23rd June 2016.

they have no money to buy, they would wake up very early (around 5am) to go and fetch water from the spring.[29]

b) There is a nearby spring just near the house of Mr. B which is just a few meters away. During the rainy season this spring is covered in silt and it has to be removed everyday. During winter the flow of this the spring water is low. Around thirty households depend on this spring. The water is very clean, it is consumed directly. The household members and their neighbours are very satisfied with the water. Till presently, they have no need for water connections.[30]

c) Kongkong has no money to purchase water. More than 85 per cent of households in Nongmynsong purchase water as it is the only source of obtaining water. Instead Kongkong acquire water from a main water pipe that was cut by someone. This water has to be shared with a number of households. Luckily, according to her, nobody has detected the wrongful act.

"*This is very convenient for us all. We do not have to go to the spring for water. The spring has no water during winter*." (Kongkong, Nongmynsong)[31]

d) In another part of Nongmynsong a particular family resides in one of the housing units constructed under the Centrally-sponsored Jawaharlal Nehru National Urban Renewal Mission (JNNURM) Basic Service of Urban Poor (BSUP) Scheme. Water is abundant here. All families residing in these units get a twenty four hour water supply. One can see the glaring inequity in the same locality.

3. In Mawlai Mawiong, the public standpipe is too far from Mrs. C's house. People have to queue for water at this standpipe. As a single mother, Mrs C and her

[29] Interviewed on 16th June 2016.
[30] Interviewed on 16th June 2016.
[31] Interviewed on 11th August 2016.

children (who go to school) have no time to collect water. Also the way to this public standpipe is steep. This household purchases water for two hundred and fifty rupees for one thousand litres (Rs. 250/1000 litres) twice a month. If the water is not delivered, they have to ask for water from neighbours. The stream is also too far. The mother is the only earning member of the family. Even on no school days, it's difficult for her children to fetch water, being young. Mrs C goes to work early in the morning. To her, the *dorbar shnong* is not doing enough. She attends meetings to voice her complaints.[32]

4. In Madanrting locality, Kong Rynjah finds it arduous to collect water too early in the morning. She leaves home for work at around 7:30am. The source of water is a stream. She travels for about half an hour early in the morning for two round trips to collect water. This water is very clean. During the winter, the stream has no water. She collects it from a spring instead which is located farther away. Kong Rynjah stated "*Nobody cares for poor people. I get really tired collecting water*".[33]
5. In Laimer, Miss Kurbah collects water form a public standpipe which takes a round trip of around ten minutes. The quantity of the flow is low and hence the waiting time is long. Many households depend on this one standpipe. She collects water early morning everyday. Sometimes during scarcity the family would either buy or collect water form a pond. The way to the pond is steep, so they often avoid it.[34]
6. Mr. Shullai of Mawpat collects water from a public standpipe. His sons take baths in a nearby river. According to him the water supply has improved now. Before this particular standpipe was installed, the family had to collect water

[32] Interviewed on 10th May 2016.
[33] Interviewed on 29th June 2016.
[34] Interviewed on 11th May 2016.

from a spring. But compared to water from the standpipe, the spring water is much cleaner. The quality of the water is superior. This family has recently submitted a household water connection form to the *dorbar shnong* for a PHED connection.[35]

7. Kong Aiti, a resident of Mawlai Mawdatbaki, expressed that her family members were not allowed to collect water from a nearby public tap because this particular tap falls within the jurisdiction of another locality. The only water sources available for this woman are springs which are far away. They undertake risks collecting water from there. In the rainy season rainwater would suffice. The landlord does not provide this family with water. They consider themselves as victims of discriminatory practices. "*I am scared to collect water*", bemoans Kong Aiti.[36]

4.8.3 Discussion

From the above discussion, it is evident that the experiences of the poor are better in areas that falls within the municipalities' area except for slums like those located in Sweepers Colony and Paltan Bazaar. The narratives of hardship and struggle exhibit the close connection between water and poverty. Domestic water supplies are one of the basic requirements for human life. Lack of access to safe and adequate water supply contributes to ongoing poverty both through the high proportion of household expenditure on water supplies, arising from the need to purchase water and/or time and energy expended in collection (Howard and Bartram, 2003). Common property resources like water are immensely valuable and exclusion can be costly for people (Pretty, 2003).

[35] Interviewed on 7th June 2016.
[36] Interviewed on 4th August 2016.

The study identifies emotional geographies of water brought about by water scarcity or inequity and also various aspects of water-fetching and water-sharing (Sultana, 2011). Analyzing the various forms of 'suffering' that people invoke highlights the emotional geographies of water, where suffering is intersubjecitve and produced through the realities of access, use, and control of water. Scholars such as Klouzal (2003) have argued that focusing on suffering enriches development research by asking about both ''material conditions and the experience of hardship, countering a tendency in development research to ignore subjectivity'' (Sultana, 2011).

Most of the poor households do not purify water before consumption. E.g. boiling of the water is costly. They can hardly afford fuel (charcoal or kerosene) to boil water. They are also faced with unfavourable water prices imposed by water vendors. Water markets are burdensome for them. The poor are vulnerable, insecure and powerless. They are as rational as anybody else but they lack the means to make rational choices (Ramphele, 2006). The more poverty is understood to be multidimensional, the closer and more complex the poverty-equity connection becomes (McDermott, Mahanty and Schreckenberg, 2013). For most of the above cases, there is "water poverty", that which erodes wellbeing (Rogers, et al., 2012).

During interviews with *rangbah shnongs*, it was establish that the poor suffer the most due to water shortage. The poor bear more of the water scarcity brunt because of the fact that they are financially worse off than others. Most of the poor are landless in Shillong, hence tenants who are dependent on their landlords for water. Poor households lack storage facilities. The associated problems encounter by the poor includes waiting in queues, conflicts with neighbors, the burdens of carting water, in-house storage, and boiling and filtering water for drinking and cooking.

Not all poor households are in 'deep water' regarding water access, quality and quantity. The study draws attention to the fact that the water experiences of the poor depends on location. Time is also a major factor but we did not include it here in this study. By location it meant which locality and whether it falls within the premises of the municipal or non-municipal area in the city. Except for slum area, the poor in the municipal area encounter lesser water-related problems than in the non-municipal area.

Another important finding is that the water scarcity that the poor are facing is not created politically. The study found no discimination, neither from the formal nor informal institutions, against the poor in domestic water supply.

Two major factors emerges which could be the reason for the poor encountering water problems are given by Bakker, Kooy, Shofiani and Martijn (2008). First is governance failure. Secondly non-networked water supply alternatives upon which a large proportion of urban poor households depend are often entirely unregulated.

A comparison between the poor and the elite/middle class sections of the city in terms of accessibility to water are given below:

1. The poor, especially in slums, are not connected to formal water networks.

2. The main water sources for the poor in the non-municipal area include springs, rivers, broken water pipes and rainwater. Many even resort to theft (see Plate 4.6). The majority of the elite/middle class households buys water or have piped water on premises.

3. In the municipal area no glaring inequity exists between the two groups due to the abundance of water and extensive network coverage.

4. Many of the poor household members spend comparatively more time in fetching water.

5. Water as a basic need is never enough to meet all personal and domestic needs at a particular time. The elite/middle class households face lesser degrees of such problem.

Plate 4.6: 'Stealing' of Water – Plastic Pipe Connected to an Iron Water Pipe in Nongmynsong Locality

***Source*: Photograph taken by the author during fieldwork, 2016**

For the bulk of the urban poor in slums and in many localities of the non-municipal area, the scarcity of potable water is a daily hardship. Governance failure occurs in Shillong because the needs of poor households have not been taken into account effectively, creating disincentives for the water supply utility to connect poor households and/or for poor households to connect to the network (Bakker, Kooy, Shofiani and Martijn, 2008). In the locality of Lawsohtun, the poor households face no water problems whereas the major part of Nongmynsong reeks of water shortage. Both these localities are outside the ambit of the SMB. This is because of good water governance rendered by its *dorbar shnong*.

Based on my household survey, the study identitifes the interrelationship of water and poverty and comes out with the following findings:

1. Water and poverty are linked by the whole inequity of a situation in which the poor get the worst service from intermittent water supply through standpipes to vended water in lieu of piped water, while the rich or better off get relatively inexpensive piped water.

2. Water and poverty are linked by connected consumers having a collective voice and the poor who are not connected having no voice. The poor do not even have the time to voice their concerns. For example, most of the interviewees who are poor do not attend *dorbar shnong* meetings. Hence they cannot directly voice their water related sufferings.

3. Water and poverty are linked by the rich being able to afford to pay bribes to plumbers for more water. This is reported in many parts of the city where there is insufficient water supply.

The rich can purchase their solutions (Sharma and Harvey, 2015). This is true especially when it comes to purchasing of water from water vendors. When water governance practices is poor (Biswas and Tortajada, 2010a), the poorer sections of the society undergo more and larger water-related problems. Water quantity, quality and accessibility all underpin the capability to meet future water security requirements (Biggs, Duncan, Atkinson, and Dash, 2013).

Urban poverty is much influenced by what governments do or do not do, also by what they can and cannot do (IIED, 2000). Beside the performance of the government, it is also influenced by what the *dorbar shnongs* do and not do. Procedural equity is

lacking from the government as well as the *dorbar shnongs* regarding provision of water to the poor.

4.9 Conclusion

Domestic water with regards to equity in Shillong is characterized by many problem and complexities. Like most developing cities, urban water distribution in Shillong takes a "center/periphery form" (Gilbert, 1998 in Wutich, 2006), in which well-provisioned municipal localities give way to outskirts with progressively fewer services. For example, outside the municipal area, dependence on the different sources of water increases. Use of different water sources also varies temporally and seasonally. In non-municipality localities, inadequacies of piped water on premises or public standpipes are supplemented by water from springs and rivers, vendors, private individuals, rainwater, etc. In some localities like Mawlai Kyntonmassar and Mawlai Phudmawri, water from public standpipes is of dubious quality. Again in many localities in the Mawlai area, those with access to networked services have problems with low quality and reliability.

Rampant mushrooming of water vendors reflects water scarcity and unequal distribution. Water vending is taken as a symptom of a failure in piped systems (Kjellen and McGranahan, 2006). Moreover, further outside of the municipal periphery water networks are non-existent. Non-networked water supply alternatives upon which a large proportion of urban households depend are often entirely unregulated in large parts of the developing world (Bakker, Kooy, Shofiani and Martijn, 2008). Similarly, this is the case in the city of Shillong. For instance, absence of regulation by the formal and informal authorities means water pricing, quality and delivery is not checked.

Water availability for domestic uses in Shillong has progressively improved during the last two decade in the municipality localities. Progress has been slow or

totally absent in the non-municipal area. Moreover distributional equity has been uneven and erratic in the non-municipality localities. About 14 per cent depend solely on water vendors to deliver water at a price. Matters like long waiting times for water connections, varying distance from household to water source are some other issues that plague non-municipal localities.

When we look at the city as a whole, we see a great deal of disparities among the localities. Surprisingly, disparities even exist within a particular locality. For example, residents in the municipality locality of Mawkhar claim that the time water is being supplied to households sometimes differ from one household to another. One household would be getting water while an adjacent household would not.

Inaccessibility or difficulty thereof affects people in many ways, for example, since water play a key role in domestic work, and inadequate water adversely influences the tasks of maintaining a home. A resident of Madanrting expressed that personal and household hygiene has to be foregone due to lack of water.[37] Also the time devoted to water collection deprives people of opportunities to live lives that they value (Goff and Crow, 2014). Without access to piped water, households and individuals are forced to use limited supplies of water, often of poor quality, from unreliable sources and usually at a high cost. The root cause of this exclusion is the long-standing inability to plan and implement water systems which respond to the reality of the lives of the people (Evans, 2007). Access to water is determined by the preexisting political, economic and social conditions under which people engage in and benefit from resource distributions (McDermott, Mahanty and Schreckenberg, 2013).

[37] Interviewed on 26th June 2016.

Currently, these are some of the issues and challenges to water equity in Shillong. In the section below two cases are given that portray the range and type of the issues troubling the water scenario:

1. Twenty year ago the locality of Laban used to get daily water supply from the SMB. Laban falls within the municipal area. Many flocked to Laban for settlement. Now it gets only forty-five minutes of water in a day. There are around eight hundred households in Laban at present. Interestingly there are no public standpipes in Laban. According to its *rangbah shnong*, the distribution network is faulty and the water quantity is too less. All that the *dorbar shnong* can do is to complain to the SMB which has been futile.[38]

2. Drilling of borewells in Shillong has been restricted by the Office of the District Commissioner, East Khasi Hills since 2014. Many households have had borewells drilled before the restriction was passed. Mawlai Mawdatbaki alone has more than thirty privately owned borewells. Having a borewell drilled is an expensive affair; it costs around rupees 2.5 lakhs for one. The borewells in this locality has been a source for water vendors for many years. Underground water from this locality reaches many parts of the city. Many people are disturbed by the fact that people with property and with access to groundwater are selling the water all over the city for profit. But in this very locality itself, many households lack adequate water.

The study has found that some of the reasons for the present water inequity in Shillong are as follow:

1. Faulty distribution system

2. Mismanagement of water

[38] Interviewed on 16th November 2015.

3. Urban sprawl

4. Growing population

5. Practice of unsatisfactory water governance

6. Non-participation

7. Absence of water sources like springs

8. Physical proximity of the network

According to the *rangbah shnong* of Mawlai Mawdatbaki, the PHED makes plans through various water schemes and by the time it is implemented, it fails due to increase in population. It does not foresee this basic urbanization trend. Urban sprawl is aggressive in the city.[39] He has witnessed the changes in water supply in many parts of the city. Below is a loose translation of his narrative.

> "*Years and years ago when there was no house water connections, people would wake up early in the morning and collect water from the many springs. Now springs cannot serve the whole population anymore. In the premises of most houses, there would be water trickling down or bubbling from beneath the ground. Now such kinds of springs have all disappeared due to urbanization.*"[40]

Similar to many Indian cities, there is gross mismanagement of water (Ahluwalia, 2014) in the city of Shillong. Distributive, procedural and contextual equity (McDermott, Mahanty and Schreckenberg, 2013) is essential in the present water supply systems of Shillong. Equal distribution of water is missing and far-fetched taking the city as a whole. As an aspiration, equity is not taken seriously by the SMB and the PHED.

[39] Urbanization decreases distributional fairness across generations (Lamorgese and Geneletti, 2015).
[40] Interviewed on 21st June 2016.

Distribution of costs and benefits is not even. Households pay more for water in the non-municipal localities and yet they generally receive less water. Overflow of water tanks in the municipality localities indicate mis-management not abundance. Localities like Riatsamthiah and Wahingdoh receive a lot of water which is mostly more than required.

No efforts exist in the city for special measures to supply water to marginalized groups like the poor. Slums in Paltan Bazaar and Sweepers Colony located in the heart of the municipal administered area have existed without decent water supply for decades. Water is a common pool resource (Giordano, Mapedza and Burns, 2014) and current mechanisms for decision making has failed to successfully recognize this.

Large proportions of the residents are vulnerable to water related problems. These vulnerabilities arise largely because of structural constraints of the governance system existing in the city (Evans, 2007). To improve urban water provision in Shillong and assure services that are safe, desirable and affordable to the people is crucial. An equitable supply for each person must be sufficient and continuous for personal and domestic uses. Equity considerations call for the recognition of the complexity and diversity of our realities and our values surrounding water. This includes how sociopolitical processes contribute to water scarcity and inequity (Lacey, 2008).

Equity can be achieved when water is treated as a common good that serves multiple values, when there is broad participation, when people are mindful of needs of non- humans and procedural fairness is practiced in making fairer water allocation and distribution (Wilder and Ingram, 2016). Water policies and actions are moving in an equitable direction when imbalances in political and economic power are being redressed and where there is a sense of responsibility to future generations (Ingram, Scaff and Silko, 1986). Reciprocity is also important because there is shared allocation of rights and benefits and also of risks and burdens associated with population growth, climate

change, etc. (Ingram, Scaff and Silko, 1986). Water equity also means equal concern for water needs which is crucial to people and of universal value and respect for people's common humanity (Jones, 2009).

Achieving equity has many conditions and principles to be followed. As already mentioned, much of the water inequity that is seen around the world is due to mismanagement. In other words, water governance is unsatisfactory. In the next chapter, we shall examine water governance executed by the traditional institutions (the *dorbar shnongs*). Being a part of the water supply system of Shillong, these institutions partly contribute to water distribution and accessibility.

To supplement our understanding of *dorbar shnongs* as dicussed in chapter 3, the next chapter examines the roles and functions of the local traditional institutions with regards to water governance system in Shillong city.

CHAPTER 5

WATER GOVERNANCE AND THE *DORBAR SHNONGS*

This chapter attempts to understand the way in which water governance system functions and its impacts on domestic water supply by examining the role of *dorbar shnongs*. It focuses on selected localities both in the municipality and non-municipality areas and examines the nature of water governance in Shillong. This chapter explores the associated institutional underpinnings of water inequity patterns, as a way to understand water governance.[41]

5.1 Municipality Localities

Umsohsun, Wahingdoh and Cleve Colony localities are selected in the municipal administered area for this study. Umsohsun is a relatively small locality with a household number of about four hundred, while Wahingdoh is bigger with around seven hundred households. Water supply in both these localities has improved in the last decade since PHED connections were given. Before, it was only the SMB that supplied water in these localities. Essentially, all houses have piped water on premises. People can either choose between an SMB and a PHED water connection.

Here one of the main roles of the *dorbar shnong* in Umsohsun and Wahingdoh localities is to give a no objection certificate to residents applying for a new water connection. The *dorbar shnong* checks and certifies the identity of the residents. Only one connection per household is permitted but if the need occurs, a household can apply

[41] For further details on 'water governance', see Lu, Ocampo-Raeder and Crow, 2014.

for another connection. The most common reason for the requirement of extra water connections is to provide water to tenants.

Another important role of *dorbar shnongs* in these two localities is to scrutinise the plumbers practicing in their localities as to whether they are registered with the SMB or not. This is a very important aspect because often time's people have been swindled by plumbers. Plumbers can lose their licenses or attract penalties if the *dorbar shnong* reports of such unwanted activities. Thus, permission has to be sought from the *dorbar shnongs* before any repairing and other related activities like digging of underlying pipes and removing of slabs. The household connected with such work has to properly repair the road, slab, etc.

Public standpipes related works that are minimal are usually carried out by the *dorbar shnong* and the costs are borne by them. For example the replacement of broken taps, construction of theft-proof structures for water pipes, etc. are common practices for Umsohsun and Wahingdoh *dorbar shnongs*. The use of public taps in Umsoshsun and Wahingdoh has diminished over the years. This reflects the coverage improvement of piped water connections.

The study identifies that most of the water pipes run through drains in most parts of these two localities. It is a common sight and objectionable phenomena rampant in the whole city especially the congested municipal area. Many problems are caused due to such unhygienic and unwanted process of water delivery. The Umsohsun *dorbar shnong* has proposed that water pipes be shifted out of the drains. But many residents objected to it stating the main reason being that they did not want to go without water for a few days when such repairing / construction work is carried out. Over here, it is apparent that a *dorbar shnong* cannot afford to convince the residents even though such steps would be beneficial collectively in the long run.

The *drobar shnongs* of these two localities obtain MLA (member of legislative assembly) and MDC (member of district council) schemes that are directed toward water supply infrastructure. The SMB does not have enough funds. So the *dorbar shnongs*' responsibility is to obtain required funds to fill the deficiency. The use of public taps in Umsohsun and Wahingdoh has diminished over the years. According to the *rangbah shnong* of Wahingdoh,[42] a *dorbar shnong* has limited authority in a municipal area. There is little responsibility that they have to shoulder compared to the localities outside the jurisdiction of the SMB.

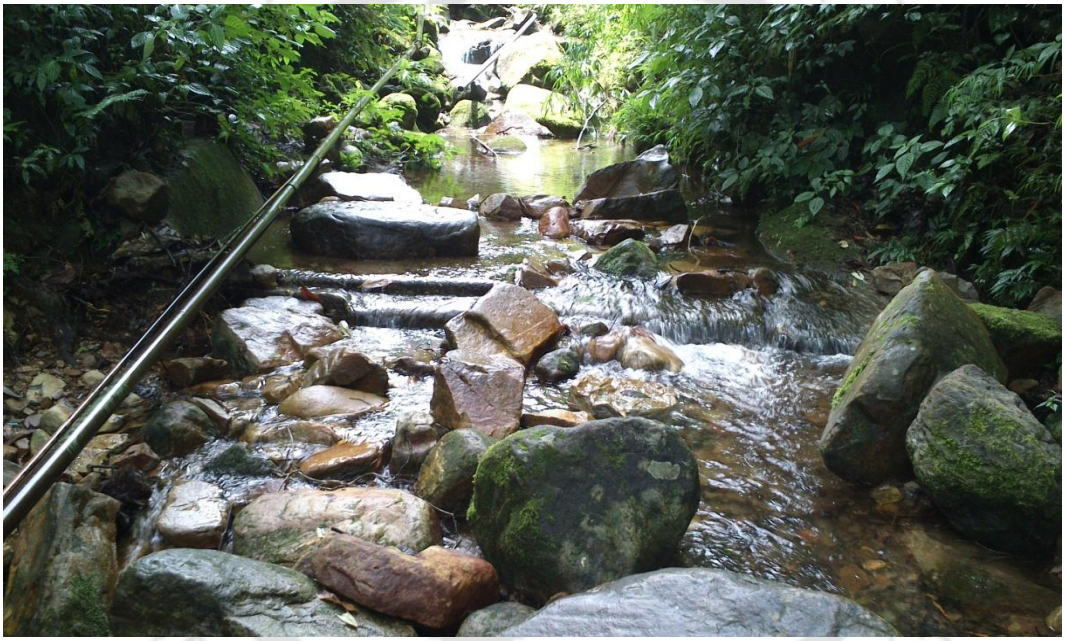
Apart from the two aforesaid municipality localities, another one chosen in the study is Cleve Colony. This locality has only about three hundred households. Here daily water supply is twenty hours per day. However water quantity is low which make it inadequate for a number of households. Though being located in the municipal area the *dorbar shnong* regulates part of the water supply here. This means that, compared to Wahingdoh and Umsohsun, Cleve Colony *Dorbar Shnong* has additional water-related responsibility and more accountability. In some sense, it is a joint activity with the SMB.

The locality has one water source which is a rivulet/stream fed by springs in a protected forest (see Plate 5.1). Earlier the locality received its water from another river located near different locality. There were complaints of the pipes being frequently disconnected and tampered with. People of the other locality declined to share water with Cleve Colony. So the *dorbar shnong* sought financial assistance from the MLA and MUDA (Meghalaya Urban Development Authority) and technical assistance from the SMB and received their own separate water network.

[42] Interviewed on 17th March 2016.

The present water source tapped is more efficient owing to proximity. Surrounded by a forest, there is not much scope for expansion of this locality. So improvement on the existing water supply network is promising. From an interviews carried out with the secretary of Cleve Colony,[43] he expressed a few major issues faced by the *dorbar shnong* at present. Successful interventions of the *dorbar shnong* are also highlighted simultaneously.

Plate 5.1: Water Source of Cleve Colony



***Source*: Photograph taken by the author during fieldwork, 2016**

Some of the major issues/tasks encountered by the Cleve Colony's *Dorbar Shnong* are:

1. In winter the amount of water in the stream is extremely low which translates to decreased quantity distributed to the residents. Although it is enough for small

[43] Interviewed on 24th May 2016.

families, it is not enough for bigger families and usually with tenants water has to be purchased.

2. In many instances the huge distribution pipes that run through the forest have been stolen. The *dorbar shnong* replaces those using MLA and MUDA funds. This issue has been deliberated with officials of the forest department of the Government of Meghalaya. However, the government has expressed difficulty in tackling such issues.
3. Another issue is regarding the SMB licensed plumbers. It has been reported of people paying them bribe for a better supply of water. It is difficult on the part of the *dorbar shnong* to check this regularly. According to the Secretary, water is sufficient but people want to see their storage tanks overflow to waste. Also according to him, people are greedy and excessively use water; they have not learnt conservation of water.
4. On one occasion, an individual tried to claim ownership to a large part of the catchment area but the *dorbar shnong* stood up against this and confronted the individual, who later surrendered. Despite being a protected forest, encroachment and trespassing is not uncommon. Construction of houses has also taken place in the protected areas. In 2003, Cleve Colony along with other adjoining localities such as Lum Sohphoh, Lum Diengsoh and Risa Colony, wrote to the government regarding the issue of government-protected forests of Shillong Peak Range. The *dorbar shnongs* of these localities requested for better protection and conservation of the catchment areas. These localities depend on Wah Dienglieng (River Dienglieng) from water supply which is located in the catchment area in question. The catchment - stretching from the Shillong Peak to the West and

River Umken in the east, has always been an important traditional natural source of water supply to the population of many parts of Shillong.

Here we noticed four localities depending on a common water source (River Dienglieng). The grievous concerns communicated by the localities have led the government to keep close vigil on encroachment in the form of illegal housing construction and so on. During the interview,[44] it was also learnt that the Indian Air force has started encroaching into this protected forest areas. But it remains to be seen how Cleve Colony *Dorbar Shnong* has to act on this matter.

Some of the problems and responsibilities encountered by the *dorbar shnong* of Cleve Colony are different compared to Wahingdoh and Umsohsun localities. According to the Cleve Colony's secretary, managing a water scheme partially with the SMB is a difficult task. Some of the routine problems and roles of municipality localities are given in the section below. This set of information was obtained not only from the *dorbar shnong* members of Wahingdoh, Umsohsun and Cleve Colony but also from other groups of interviewees of different localities. Ideally, it can be safe to say that the following points can be generalized for all localities in the municipal area.

5.1.1 Water Related Problems in the Municipal Area

Some of the major water related problems in the municipal area are indicated as follow:

1. Water is sufficient for most part of the year. For two to three months of the year (mostly March-April) water becomes insufficient. Also, many households report of erratic water supply.

[44] Interviewed held on 12th October, 2016

2. Wastage of water remains unchecked in many localities. This pertains mostly to public standpipes. Disproportionate water supply among the localities is recurrent.
3. Being in the municipal area, most *dorbar shnongs* have an indifferent attitude towards domestic water supply. The *dorbar shnongs* in areas like Umsohsun with comparatively more financial resources is unwilling to spend for water related issues.

5.1.2 Roles of *Dorbar Shnongs* in Municipality Localities

The major roles of *dorbar shnongs* in municipality localities are listed below:

1. Relating to connections of piped water on premises, roles are similar in both municipal and non-municipal areas. First, permission is required for water connection in household in which a "no objection certificate" has to be issued by a *dorbar shnong*. Second, if a household with an existing water connection (piped-on-premise) seeks permission for an additional household connection, the *dorbar shnong* checks the validity of the requirement.
2. Another common role of the *dorbar shnong* is checking of plumbers. In the municipal areas, all plumbers must have practice licenses. *Dorbar shnongs* plays a watchdog on this and have been vigilant enough regarding erring plumbers.
3. *Dorbar shnong* with funds repair public standpipes, water tanks, etc. Those who lack funds depend on the PHED or SMB.
4. Acquiring of MLA and MDC funds for water related expenditure – It is through *dorbar shnong* that MLA and MDC schemes are directed toward water supply infrastructure. The SMB does not have enough funds. So the *dorbar shnong's*

responsibility is to obtain required funds to fill the deficiency. Some also get funding from MUDA and other sources.

5. Complaints are registered through a *dorbar shnong* to the SMB and PHED. There are *dorbar shnongs* who do not entertain water related complaints and instead ask that the complaints be directly registered with the final authority.
6. *Dorbar shnong* try to protect the catchment areas. As mentioned, for instance Cleve Colony and other *dorbar shnongs* solved the problem of a person who falsely claimed ownership to the *law syiem* (forest of the ruler or chief). Thus they assisted in checking such illegal activities. Their concern is the protection of the water supply.

5.2 Non-Municipality Localities

In order to identify the major water related problems and role of the local traditional institutions, localities such as Mawlai Mawdatbaki, Nongkhryiem, Nongrah, Lawsohtun, and Mawpat have been selected in non-municipality areas for the study.

5.2.1 Mawlai Mawdatbaki

In Mawlai Mawdatbaki locality, there are around two thousand households. Only thirty per cent (30%) of these households have PHED water connection (piped water on premises). Those with piped water on premises get their water only twice a week for charges of rupees two hundred for one month (Rs. 200/month). But people are not satisfied with both quality and quantity of the PHED water. According to the *rangbah shnong*, there is a lot of leakage before the water reaches Mawlai Mawdatbaki and thus both quantity and quality are being affected.

The rest of the households (seventy per cent) depend on public standpipes, springs, rivers, streams and borewells. Public standpipes are the lifelines for the majority of households here. There are around thirty public standpipes in Mawlai Mawdatbaki. Public standpipes are supplied with water from underground water and the Umsohlang River. Like most rivers in the city, this river has become polluted due to anthropogenic factors (see Plate 5.2). A treatment plant of Umsohlang stream has become outdated. Treatment of water has become largely futile. Households who used to depend on this water source cannot consume this water anymore. The undrinkable water can be used for washing and other domestic purposes.

Plate 5.2: A Polluted River in Shillong

***Source*: Photograph taken by the author during fieldwork, 2016**

Before the government passed the notice of restriction, many localities have disallowed borewell drilling due to many reasons. In the case of Mawlai Mawdatbaki, *Dorbar Shnong* however, has not restricted drilling, as it did not notice any effect on the

local springs, as has been the case in many parts of the city. People and the *dorba*r know that they cannot depend on the PHED. According to an interview with a resident here, "their right to water cannot be violated".[45]

This locality also has many springs. One of them is a perennial spring located in *dong* (division) Umparmaw of the locality. Some parts of this locality with no water connections depend on this spring as their only source. Many households depend on this spring. The water is inaccessible to many due to distance and steep terrain. For such residents, they have no alternative but to purchase water. The people who live near this spring and who can easily access its water are facing a problem at hand. They have noticed that water quality has been affected to leakage from a nearby drain into the tank. This fact was corroborated with the *rangbah shnong* during the interview. The *dorbar shnong* does not allow water from springs to be collected and sold. There are a few springs designated only for washing of clothes.

During an interview with the *rangbah shnong*, he recounted of a conflict that involved a particular family using a pipe to channel the water to their house from a public standpipe.[46] Families further away from this public standpipe would resort to activities like using a wooden stopper and asking the *dorbar shnong* to shift this standpipe to another location. The surprising note is that this particular household channels the water when everyone has collected their share; according to the *rangbah shnong*, the element of jealousy causes such unwanted social behavior in the locality. After the relocation, the same problem erupted. Complaints regarding this issue reached the *dorbar shnong*. This particular standpipe was eventually removed. This water conflict arose not because of lack of water but is water-related. Similar issues like these are faced by the *dorbar shnong*. Other interviewees also report similar conflicts between

[45] Interview held on 4th August 2016.
[46] Interviewed on 21st May 2016.

persons within the same locality and between two localities. Residents in other localities like Pynthorumkhrah and Nongmynsong report that there have been many occasions where the unavailability of water led to fights and quarrel in the area.[47]

Remarkably, the *dorbar shnong* of Mawlai Mawdatbaki frequently communicates and holds meetings with the PHED engineers. One issue the *dorbar shnong* has been raising is that the PHED should concentrate on such locations where springs are not present and where the terrain makes it difficult for water collection. Further, house connections should be prioritized in such areas.

5.2.2 Nongkhryiem

The community water (*umshnong*) sources in Nongkhryiem are chiefly from springs and a river, which accounts to about seventy per cent (70%) of total local water supply and another thirty per cent (30%) from the PHED. On an average the community water supply is for forty-five minutes daily (45 min/day), which according to the *rangbah shnong* is sufficient to meet the household's needs. The whole water infrastructure was provided and set up by the PHED i.e. for both community and government-provided water.

The water fees are fixed by the *dorbar shnong*. Rates differ according to source of water supplies. These water fees are used for – paying electricity bills for pumping the water, general maintenance costs, and other expenditures like salary of the plumber, etc. There are two water supervisors in this locality which are paid by the *dorbar shnong*. Many times even PHED pipes are repaired and funded by the *dorbar shnong*.

The PHED water fee is higher than the *umshnong* fee. The residents are proud to have their own sources of water supply. The residents opine that water quality is good

[47] For more information on water conflicts', see 'Relinquishing droplets of joy', *The Shillong Times*, February 26, 2013 (Accessed on December 12, 2016)

and in fact better than the PHED. The water supplied by the PHED at times is red in colour and unfit for consumption. Therefore, most residents prefer community water.

However, the existing community water in Nongkhryiem is not sufficient anymore for house connections. Even new connections from PHED are no longer given. Greater Shillong Water Supply Scheme (GSWSS) Phase III was supposed to cover this locality.[48] While interacting with some of the *dorbar shnong's* committee members, they anticipate water crisis in the city as a whole and the present water source cannot sustain the growing population. They further expressed that community borewell drilling in the future is inevitable, yet no individual household borewell is permitted in Nongkhryiem. The *dorbar shnong* recognizes the necessity of protecting and preserving water sources and catchment areas. And for this they will have to work in close collaboration with the concern government departments.

In recent years, Laitkor, a village in the upstream areas proposed to dam the river for water supply. Nongkhryiem and other localities protested and the proposal was withdrawn. Here we notice a case where the *dorbar shnong*s played a significant role and was able to protect and sustain the water supply of their localities. The *dorbar shnong* has approached the PHED to dam the same river for water supply. Clearance has been given by the Forest Department.

The section below has listed some significant features predominant in Nongkhryiem locality:

1. In a few localities in the city only a member of a certain clan can be a *rangbah shnong* (headman). But here in Nongkhryiem, even a person who does not belong to the Khryiem clan can become a *rangbah shnong* now unlike before.

[48] Interview with the *rangbah shnong* of Nongkhryiem on 11th April 2016.

2. A separate water committee to manage the water is present here. Female members are also included in the committee.
3. The water committee exercises its authority for the improvement of water supply in the locality.
4. Unemployed people of the locality are permitted to sell the spring water of the community to adjacent locality households using small water containers only.
5. Community water is efficiently distributed.

5.2.3 Nongrah

Nongrah has around sixteen hundred households. Nongrah has numerous water-associated problems. It is found that not a single household in this locality has water connection from the PHED or the *dorbar shnong*. The PHED only provides spring water through two pumping schemes to public standpipes. According to the *rangbah shnong* there are eighty public standpipes in Nongrah. Upon observation and interviewing four residents, many public standpipes are non-functional and the water supplied from the functional ones is not enough to meet water needs[49]. The supply is for only two hours per day which is extremely inadequate. The sole option for majority of the households is to rely on purchasing water. Some households also procure water from community springs located in adjoining reserved forest. According to the *rangbah shnong* there is plenty of water sources in the adjoining forest but it flows freely into the Umkhrah River untapped.

A new water supply scheme worth twenty-seven crores is on the horizon for Nongrah.[50] The only way out to avail this scheme is to have an Open Defecation Free (ODF) certificate issued by the central government under the Swachh Bharat Mission

[49] All interviews held on 13th September 2016.
[50] Interview with the *rangbah shnong* of Nongrah on 5th September 2016.

(Clean India Mission).[51] During and interaction with the *rangbah shnonng* during the month of July 2016, we were informed that around ninety households still use pit latrines in his locality. Mention may be made here that a locality / village applying for water augmentation schemes must have an ODF certificate as per the guidelines of the Ministry of Water and Sanitation, Government of India. One of the most significant roles of the *dorbar shnong* at present is to fulfill this requirement to obtain this scheme to ensure better water supply.

Like most localities, borewell drilling has been prohibited by the *dorbar shnong* since 2008 because of an incident where the drilling of a particular borewell affected the water discharge of a community spring. An agreement was reached with the owners that they must not utilise the water for commercial purposes. As discussed earlier, minor repair and small expenses pertaining to public standpipes is borne by the *dorbar shnong*. The *rangbah shnong* said that one of the aims of the *dorbar shnong* is to encourage groundwater recharge in the form of soak-pits. Some of the activities taken up by the local *dorbar shnong* are renovation of the existing water supply scheme of public standpipes and construction of structures around the community springs.

5.2.4 Lawsohtun

Lawsohtun is a locality outside the prerogative of municipal administrative boundary. It has a population of around eleven thousand. Around eighty-five per cent of the households (approximately) are covered by piped water on premises. The duration of water supply is an average of six hours daily (both morning and evening). Springs are the major sources of water in this locality. The waters were tapped by the *dorbar shnong*

[51] Swachh Bharat Mission is a campaign launched by the Government of India on October 2014. Its main aims it to clean up India. One of its main goals is to eliminate open defecation by construction of toilets.

long before the PHED came into the picture. However, with increase in population assistance was sought from the PHED.

Underground water is also utilized in the form of six bore-wells which supply water to the locality through public standpipes. These are maintained by the PHED and Lawsohtun *Dorbar Shnong*. The PHED constructed six main tanks and another twenty branch tanks are constructed by the *dorbar shnong*. Funds for such purposes and other water related requirements are obtained by the *dorbar shnong* mainly from the respective elected representatives such as the MLA and MDC.

The *dorbar shnong* is committed to preserving the water sources and catchment areas. Since 2011, borewell drilling has been prohibited by the *dorbar shnong* as groundwater extractions affect the spring water discharge.

Being aware about population growth and expansion of settlement areas, the *dorbar shnong* of Lawsohtun has already explored other potential sources of water supply to sustain the households. One nearby waterfall known as Kshaid Tymmen was located by the *dorbar shnong*. To tap the water from this waterfall permission was sought from the Forest Department and the *Syiem* of Hima Mylliem. The *dorbar shnong* has also communicated the matter to the PHED so that they can initiate the water supply scheme.

As and when such permission is granted to the *dorbar shnong*, the PHED is prepared to begin with the construction of a reservoir and other water infrastructure. Seeing the current partnership between the Lawsohtun *Dorbar Shnong* and the PHED being on a positive note, the work could process within a few years.

It is also noteworthy that members of all the *dorbar shnongs* work on a voluntary basis. The degree and quality of service rendered differs from one *dorbar shnong* to another. What is interesting in the context of Lawsohtun *Dorbar Shnong* is that a greater

sense of accountability towards its citizens is witnessed. On account of which the PHED wants to hand over the whole water supply project to the *dorbar shnong*. Some of the future plans include replacement of old pipes both for house connections and public standpipe connections. Another goal in the pipeline is to control wastage of water. According to the secretary of the *dorbar shnong*, water is a gift from God; therefore they have a stewardship role to take care of it. The locality is also involved in tree plantation.[52]

Water is sufficient for all households in the locality. Those without piped-in-premises collect water from nearby public standpipes. Every winter, some parts of the locality encounter water shortage due to faulty distribution system. The main reason is lack of water tanks. The *dorbar shnong* have taken initiatives to find a remedy to tackle this problem. In comparison to other localities outside the ambit of SMB, Lawsohtun executes exemplary water management by its *dorbar shnong*. The locality boasts of its clean water which according to them tastes better than other waters in the city.

In Lawsohtun we see several features that contribute to its near-equitable water distribution which are highlighted as follow:

1. Lawsohtun *Dorbar Shnong* committee members are dedicated. Residents are satisfied with its functions. Its leadership team is agile.
2. Office bearers of the *dorbar shnong* are prudent. They set rules and regulations for all water consumers in the locality which have to be strictly followed.
3. Water related assistance is prompt due to the hiring of full-time plumbers by the *dorbar shnong*.

[52] Interviewed on 31st May 2016

4. Besides improving water supply at present, the *dorbar* is preparing for future water needs.
5. It adopts and extends its authority further and better than most *dorbar shnongs* in the city.

5.2.5 Mawpat

Another locality being examined in the study is Mawpat. It has more than one thousand households and a majority of them experience large-scale water scarcity. Similar to those localities outside the ambit of the municipality, the residents obtain water in four different ways: piped-in-premises, community springs, public standpipes and purchase of water. Purchasing of water is one of the major sources of obtaining water in this locality. Community springs are mostly used for washing of clothes. There are around eighty public standpipes but not enough to meet water needs. Households with piped-in-premises constitute less than twenty per cent of the coverage. For the rest, water for consumption is obtained mostly through water vendors, which is the only available alternative. For a record, only a handful of households practice rainwater harvesting here.

Recent efforts by the *dorbar shnong* to deal with recurring water problems include the acquisition of a piece of land for installing a distribution tank. A local resident donated another piece of land for the same purpose. Like in Lawsohtun, water drilling has been prohibited when the *dorbar shnong* saw the effect it had on existing springs in the area. The *dorbar shnong* also spearheads by engaging the local community in tree plantation programs in the locality. According to the secretary of the *dorbar shnong*, the reason this program was initiated was to ensure a regular flow of water in the

community springs.[53] Since 1992, felling of trees has been banned in the community forest,[54] which is around one hundred acres in size.

Apparently the efforts put in by the Mawpat *Dorbar Shnong* are minimal when compared with that of Lawsohtun. Unlike Lawsohtun, Mawpat does not keep its own plumbers nor check wastage of water. Residents are not satisfied with the functioning of *dorbar shnong* concerning matters related to water issues. Perhaps this could be an essential factor, if not the most critical one as such general issues account for the water scenario in Mawpat. Some residents even complain that their *dorbar shnong* even discriminates in water distribution.

As an expanding locality, many new residents come to reside in Mawpat. In Lum Wahktieh, a division of the Mawpat locality, there are no piped-in-premises. People here used to go to river for washing their clothes. At the time of the field study, the water here was unusable as it was extremely polluted. The residents narrates that the *dorbar shnong* treats them like 'outsiders'. Providing water connection has not been a priority for the *dorbar shnong* in this area. Their water associated-problems are overlooked, giving priorities to the previous inhabitants of the locality. The 'outsiders' (in this context the 'new comers') have no voice in the *dorbar shnong*. People here feel that they are being discriminated upon, not only in terms of water supply but other issues as well. Though the number of households is many in Lum Wahktieh, surprisingly they do not have even a single public standpipe.

In the context of Lum Wahktieh locality, it is evident that there is a presence of politics of recognition and water grabbing that gives rise to inequity in this place.[55] In a

[53] Interviewed on 14th April 2016.
[54] Such a forest is called *lawshnong* in local dialect. Possession of such a forest carries a sense of pride. Lawsohtun also has its own community forest. Protection of such forests by the *dorbar shnongs* is important water security.
[55] For more details on water grabbing that results to inequity, see Lu and Crow (2014).

sense, this *dorbar shnong* exercises its power and makes what are essentially "political decisions about people's access" to water (Sikor and Lund, 2009).

Unlike the case of Lawsohtun, the study reveals four major shortcomings of Mawpat's *dorbar shnong*, which are,

1. Unlike Lawsohtun, Mawpat does not keep its own plumbers.
2. It does not check wastage of water.
3. Residents are not satisfied with its water related functions.
4. It discriminates in terms of water distribution which gives rise to "manufactured scarcity" (Johnston, 2012).

5.3 Water Related Problems in the Non-Municipal Area

As discussed in the above sections the *dorbar shnongs* in the non-municipal area has encountered more water-related problems. The roles of the *dorbar shnongs* regarding the scenario of water governance have already been detailed in Chapter 4. Hence, from the ongoing discussion it is evident that these institutions have additional water-related roles to perform.

The section below provides list of problems encountered and roles of *dorbar shnongs* in the non-municipality localities.

1. The PHED has not been able to provide water connections to most of these localities. Hence water inequity is extensive and rampant.
2. *Dorbar shnongs* lack funds to provide assistance in their respective areas.
3. Households depend on a number of sources for water.
4. In matters of water distribution, the poor households are deprived and usually at the receiving end.
5. Inter localities and intra locality water-related conflicts are commonly witnessed.

Further, the study has indicated that water supply is better in municipal localities. As the government has shown keen interest in the expansion of the municipal area i.e., the inclusion of more localities under the municipality—this could mean better water supply for more localities due to more municipal funding. But the *dorbar shnongs* are firm against such steps. They are unwilling to be under the purview of the municipal authority.

Based on the interviews, some of the main reasons for their unwillingness and desire to remain outside the purview of the SMB and MUDA are listed as follows:

1) They are used to living 'outside'.
2) They see it as a kind of kind of anarchy.
3) To evade taxes like house tax, water tax, holding tax, etc.
4) No permission is required for construction of houses in the non-municipal localities.
5) When the government 'encroaches' many complexities arise.
6) *Dorbar shnongs* want to avoid cumbersome paperwork.

5.4 Roles and Functions of *Dorbar Shnongs* in Non-Municipal Localities

The major roles and functions of *dorbar shnongs* in non-municipal localities are listed below:

1. Like the municipality localities, NOC is required for a house water connection in non-municipal localities from the *dorbar shnongs*.
2. In many of the non-municipal localities, there are plumbers who are kept by a particular *dorbar* for rendering service to that particular *dorbar* only. For example, in Lawsohtun plumbers are engaged on a full time basis because of heavy work. This is because this *dorbar shnong* manages the water supply

scheme along with the PHED. The *dorbar shnong* pays the salary from its own funds.

3. There are *dorbar shnongs* which own property i.e. community land like forests. They are committed in protecting these forests. Also, they oversee the protection of reserved and protected forests of the government (acting on behalf of the concerned authority). Eventually, protecting these forests aids in preserving both surface and underground water.
4. Being outside of the municipal area, many *dorbar shnong* have to intervene for better water supply. They seek support and aid from local MLAs, MDCs, PHED, etc.
5. The *dorbars* collect water fees on behalf of the PHED. They also have their own funds collected from the residents. These funds are utilized for water related works besides others.
6. They construct water infrastructure like water tanks, structures around springs for washing of clothes. They also maintain public standpipes and borewells.
7. The *dorbar shnong* in locality like Lawsohtun is proactive. Households here are always sufficient in their water requirements. Another locality that is equally proactive is Nongkhryiem. Though water quantity is not sufficiently provided to meet all their needs, the active and responsible role of this *dorbar* has ensured equity in water distribution. It is being supplemented by PHED water supply.
8. Construction of minor water-related infrastructures.
9. Protection and preservation of water sources such as springs and streams.
10. A *dorbar shnong* acts as a medium for complaint for problems beyond its capability.

11. *Dorbar shnongs* also engage in resolving water-related conflicts.

5.5 Discussion

5.5.1 Nongkhryiem and Lawsohtun: Exemplary Water Governance

There are similarities in the way in which Lawsohtun and Nongkhryiem water is administered. Lawsohtun and Nongkhryiem reinforce a sense of community among its residents. Rydin (2010) holds that such initiatives would add to social sustainability. Lawsohtun and Nongkhryiem localities envision a future water scenario that is based on principles of equity and accountability. The implementation of any long-term goal on water governance will require the understanding of the changes and challenges that are likely to be faced in the coming years (Tortajada, 2010). The practice of 'good water governance' by these two localities is commendable. There exists a democratic and coherent coordination and a regulation process that leads to equitable, efficient, and sustainable water usage (Sehring, 2009). What is seen here is a classic case where the local level peoples no longer rely exclusively on the state (Franks and Cleaver, 2007). What has developed within these *dorbar shnongs* is 'institutional bricolage', to borrow the terms used by Sehring (2009).

Therefore deregulation may become feasible for better water governance. If these *dorbar shnongs* are empowered they will distribute the water more efficiently in a transparent and judicious manner. The d*orbars shnongs* thus have such capability. As the *dorbar shnongs* are well equipped with governing small areas, it becomes easier and more workable. By and large, water supply systems are at a smaller scale. However, one major obstacle is that the *dorbars shnongs* do not have the wherewithal to handle large projects which can limit their capacity.

According to Tropp (2007), one of the dimensions of good water governance is equitable use. Hence, there is water equity in these two localities and water is efficiently distributed. It is observed from the study that although the traditional institutions operate in the urban setting they still imbibes characteristics of transparency, conscientiousness and community-centricity. The reason for the persistence of these particular *dorbar shnongs* is not just that they perform a certain functions but they also serve the interests of people and culture (Sehring, 2009). Such characteristics have the potential to be relevant in the 21st century if they are effective thus earning the confidence of the community.

In Lawsohtun and Nongkhryiem the community engagement is pretty strong and thereby develops a sense of belonging. In the process that encourages people to gain a better appreciation of their capacity to bring about change within their local community by networking people and re-invigorating a more contemporary interpretation of community values in a networked society (Hearn and Stevenson, 2011) making these age-old traditional institutions relevant for the present times and demands. As opined by Gottdiener, Budd and Lehtovuori (2016) since secondary and tertiary relations dominate cities, it is pertinent for these institutions to take advantage of their social capital.

Also, these *dorbar shnongs* have general rules in relation to the institutional structure and functions that can assist in the implementation of the procedurally just decision-making processes in the localities in urban water management (Syme, 2008). *Dorbar shnongs* are institutions that can be referred as the "prescriptions that humans use to organize all forms of repetitive and structured interactions" (Ostrom, 2005). The prescriptions are rules and norms (Andries and Janssen, 2013) that apply to water collection, consumption and maintenance. The Lawsohtun's *dorbar shnong* has a set of guidelines for its residents specifically regarding water management. For change to occur

in urban water provision it is these dynamic social aspects like values and behaviour at individual, organizational and community levels that can drive it (Syme, 2008) which rules and norms have a part to play.

As institutions, Lawsohtun *Dorbar Shnong* and Nongkhryiem *Dorbar Shnong* have the "delivery capability" (Padowski, Carrera and Jawitz, 2016) to augment water supply. To a certain extent they also have the transformative capacity, which is defined as the ability of a governance system to adapt to current or anticipate changes in the social or natural environment (Pahl-Wostl, Gupta, Lebel, Schulze and Stuart-Hill, 2015). Though institutional fragmentation engagement (Keremane, McKay and Wu, 2017) is still a challenge for most part of the water governance system, the successful case of PHED and Lawsohtun *Dorbar Shnong* in generating efficient water supply to all households of Lawsohtun shows that it is achievable and hence can be replicated. The co-production of such successful stories in theses localities (see McMillan, Spronk and Caswell, 2014) would be valuable.

In general *dorbar shnongs* can be said to be clusters of small groups of people. One of their strengths is their strong social capital. Lawoshtun, through its *dorbar shnong* utilizes its social capital more rationally than Mawpat. This has led to the development of better governance (Portes, 2000) of water. The *dorbar shnongs* of Lawsohtun and Nongkhryiem, as informal institutions, work closely with the PHED and such coexistence and interdependence is inescapable for the management of water (Mowo et al., 2013).

The success story of water supply system in Lawsohtun and Nongkhryiem has proven the relevance of the traditional institutions (*dorbar shnongs*) in water management and governance. It is convincing enough to opine that urban water management is not merely a technical issue but also a social and political issue and this

involve a multi-level integrated approach involving all actors (Neto, 2016). Hence, *dorbar shnongs* as grassroots institutions are indispensible. Since solutions to water problems depend not only on water availability or scarcity but also on many other factors including the processes through which water is managed, competence and capacities at the institutional level, attitudes and perceptions and social and environmental conditions (Casadevall, 2016), the importance of institutions like the *dorbar shnongs* cannot be overemphasized.

5.5.2 Impediments to Good Water Governance Confronting the *Dorbar Shnongs*

The city of Shillong has around one hundred localities each with its own *dorbar shnong* and each different from one another. One can imagine the complexity of their governance of water system and the result thereof. Each *dorbar shnong* functions on its own accord and each being accountable to no higher authority. Perhaps this is one of the chief causes for the present state of water supply in the city.

Solutions to water related problems depend on several factors and governance of water by the traditional institutions is one such possible approach. The water governance practiced by the Lawsohtun *Dorbar Shnong* can be considered to be good due to its capacity of achieving results in a fair and inclusive manner. Such steps would be complimentary to sustainable water management practices, which in a way also contributes to ensuring water security in the future (Akhmouch and Correia, 2016). Here we see a kind of governance that accommodates the people's interest unlike in Mawpat where the *dorbar shnong* governs water by (mis)using its power to dominate and in determining who gets water.

Water-related role of Nongrah *Dorbar Shnong* is comparatively limited and narrow. One of the main reasons being the absence of piped water on premises. Its water

management is confined mainly with public standpipes and community springs. The *dorbar shnong* has been demanding for water connection. But residents here were unsatisfied and expressed that the *dorbar shnong* has been laid-back and unproductive in their assigned responsibilities. This claim is evidently proven to be true and is clearly supported by the many number of standpipes in the locality that have interrupted water flow.

Despite such shortcomings, one cannot ignore that there are also many barriers obstructing the *dorbar shnongs* that slow down and/or delay good water governance practices. Such hindrances are both internal and external and the presence or absence of these challenges is contingent and should be understood contextually i.e. the people concern and place/locality.

First, *dorbar shnongs* in the urban arena faces problems of division, disinterestedness and impassivity. In this context, Wirth (1938) argued that size, density, and heterogeneity of the urban population paved the way for impersonal, transitory, and secondary social relationships based on anonymity, formality and rational interest (Abraham, 2014). The relationships of urbanites are impersonal, superficial, transitory, and segmented and "the reserve, the indifference, and the blasé outlook which urbanites manifest in their relationships may thus be regarded as devices for immunizing themselves against the personal claims and expectations of others" (Wirth, 1938).

For the sake of self-preservation, modern man tends to develop a defensive reserve around his personality to shelter from the overwhelming social forces around. Also, selfishness brings about human interactivity in our cities (Moroni, 2018). Individuals living in today's mass society acquire what Simmel (2002) calls the "blaśe attitude" which involves antipathy, repulsion and utmost particularization. This attitude

precludes them from interacting with other men fully. Instead people interact with one another in the most rational and impersonal way (Abraham, 2014).

Second, as 'representatives' of the citizens, members of *dorbar shnongs* feel "duty-bound" (Hearn and Stevenson, 2011) and the feeling may not shared equally inter nor intra *dorbar shnong*. This results in the differences in water governance system of these institutions. Another reason is that water governance depends on how determined and 'powerful' the *dorbar shnong* is. It is surprising that there are even headmen who are 'forced' to take up their position because there is none willing. The kind of service rendered is affected in different ways. Moreover, headmen and others office bearers of a *dorbar shnong* are not paid any form of remuneration.

Third, the interaction with other institutional systems, such as local government is low. Instead of acting as a vital bridge between community and the administration most of the *dorbars shnongs* are instead prompting confrontation with state government. This has produced governance of confrontation instead of governance through cooperation (Blah, 2016). Communication between different *dorbar shnongs* is also inadequate. This has a glaring impact in the way water flows through the city. This shortcoming produces a situation where co-operation is reduced.

Further, in the municipal area most urban water systems are excessively centralized and heavily dependent on public funding which bolster weak institutional framework at all levels including the *dorbar shnongs* (Barraqué and Zandaryaa, 2011). This in turn has given rise to a lackadaisical position of these institutions in the municipal area.

There are still many impediments to the *dorbar shnongs* in exercising good water governance in Shillong. These are summed up briefly in the following points:

1) As office bearers' membership in these institutions is voluntary in nature, members might lose interest or commitment in the long run
2) Lack of management capacity
3) Undemocratic practices
4) Political interests (other than water)
5) Lack of resources (financial, human, material)
6) Lack of political will of the government
7) Exclusiveness
8) Community awareness and acceptance
9) Lack of functional and organizational flexibility
10) Lack of institutional linkages (including with other *dorbar shnongs*)

5.5.3 Challenges and Opportunities

A few important issues were identified during the course of the study. They underscore the data and discussion thus far and expand our understanding of the cause and effect of the present state of water equity and governance in the field site. These are discussed in the following sections below.

5.5.3.1 Clans of Nongkhryiem and Nongrah

In some localities there is a prevalence of clan superiority and control of power over the local institutions. There are *dorbar shnongs* where clans still hold a lot of power. For instance, the Thangkhiew clan in Nongkseh, the Khryiem clan in Nongkhryiem and the Pyngrope clan in Nongrah have overriding control over the *dorbar shnongs*. A few clans have commercialized water and also claim ownership and water rights through the customary law of inheritance.

The Pyngrope clan owns large parts of Nongrah and hence many sources of water. Before the restriction of borewell drilling, a few households belonging to this clan had already drilled borewells. The clan members also own a number of springs. The clan sells water for profit to the majority of the households in Nongrah and also to other adjoining localities. The clan even supplies water through piped-in-premises at a high price (around one thousand rupees per month) for a number of households in Nongrah.

In Nongkhryiem locality, the Khryiem is the dominant clan and maintain certain control over land ownership. It owns the springs and the land through which a river flows. Unlike the Pynropes of Nongrah, the Khryiems do not sell their water for profit; instead they distribute water to all the residents of the locality. The *dorbar shnong* manages the supply of the water here. The water distribution charges are minimal. The clan even shares its "clan waters" not for Nongkhryiem residents only but to other localities including Lumsohphoh and Lumpyngngad. A spring belonging to the clan is collected in a tank free of cost for anyone to use. People from other localities also collect water from here. Here water provisioning is operated on the basis of solidarity, reciprocity or need where water is provided as a gift by the clan (Moretto, 2007). Here people derive benefits from water without holding property rights to it (Sikor and Lund, 2009).

In both these localities (Nongrah and Nongkhryiem), the *rangbah shnongs* (headmen) belong to the respective clans. There are close ties between power structures and the control of resources (Strang, 2004). In the case of the Pyngrope clan in Nongrah, the clan members' actions have become "subordinated to the pursuit of profit" and "political effectiveness" (Pawłowski, 2008).

In this context, we see how water equity is affected. In both localities, the PHED water supply is available but not sufficient. Most households are not covered. In the case

of Nongkhryiem, if the 'clan waters' were not shared the situation would be very different. There would be severe shortage of water.

The clan system in Shillong has undergone a change and is not inclusive anymore. Currently, "the traditional matrilineal *Kur* (clan) system has broken down and exists only in name; the traditional land tenure system based on community ownership of land and natural resources has also broken down, leading to absolute private ownership by individuals . . . all members of a *Kur* no longer have equal right in the so called *Ri-kur*, which is now owned only by a few families of a certain *kpoh* (lineage)" (Lyngdoh, 2016b). In the urban context, it is usually comprised of only a few families in close physical proximity. This is the case for both the clans in Nongkhryiem and Nongrah. In the name of their clans, these few families exert power to dominate or garner support from the community. Both families (clans) have a sense of authority over their respective localities and the water in particular. However, as discussed the ways in which they exercise such power differ altogether. The main implication here is that these clans have a lot of influence on the water governance activities of their respective *dorbar shnongs*.

5.5.3.2 Groundwater

Bodies of fresh water are often common-pool resources, which pose challenges for governance because restricting access (excludability) proves difficult, and deterioration occurs with overuse. In addition, rights to water are often inequitably distributed (Tucker, 2014). Groundwater is also a common pool resource. As a common resource it is shared and is accessible to members of the community (Anderies and Janssen, 2013). Common-pool implies that several users will inevitably use the same resource, and so equity in allocation amongst them becomes a central issue (Lele, 2017). Common pool resources have been defined as natural or manmade resource systems that

are large enough to make it costly or difficult to exclude people from them (Ostrom, 1990). It is customarily accepted across India that a well on a piece of land belongs to the owner of that land, and others have no right to extract water from the well or restrict the landowner's rights to use the water. So groundwater is mostly controlled by the private sector (Wate, 2012).

In this study, the issue with groundwater is important in order to understand the nature in which the *dorbar shnongs* function as water institutions. Groundwater is a complicated issue all over the country and so is the case in Shillong. First, rights to groundwater and surface water are treated very differently. Groundwater remains open access and unregulated and landowners are entitled to abstract as much groundwater as they can. The equity implications arising from this expansion of groundwater use apply not only to other groundwater users but also to surface-water entitlements as well (Srinivasan and Kulkarni 2014). Concerning the ban on borewell drilling (as it affects surface water) has already been discussed in Chapter 4. The unidirectional flow of water creates an inherent 'upstream–downstream' asymmetry of impacts (Lele, 2017). This is a matter where there is consensus among all the *dorbar shnongs*. The interconnectivity of groundwater and surface water exacerbates inequitable allocation of water (Lele, 2017).

Maldistribution of water mostly by the government agencies in Shillong led to commercialization of water—as water is considered to be marketable commodity. Most of the water sold in the city is underground water coming from localities like Mawlai Mawdatbaki and Nongrah. It has led to the mushrooming of informal and unregulated water vendors. Private individual who owns land has the ultimate territorial authority. Hence they sell 'their' water. Land ownership was different with the Khasis as private individuals or families were considered to be mere holders of the land. In fact it was the *dorbar shnong* which has ultimate territorial authority. However, all the land laws and

ownership system has changed after the British left and with urbanization it has taken a different turn.[56]

Today groundwater is elusive to most people in Shillong because of three main reasons: 1) Borewell drilling is unaffordable to many who own land; 2) Groundwater cannot be tapped in all parts of the city. For example, in Umsohsun, borewell drilling has been attempted but ineffective; and 3) Restriction on borewell drilling. Only with special permission can a private party drill a borewell in one's premises. But shallow dug wells are a source of water in different parts of the city like Langkyrding Mihngi. Though control over water resources is dictated by land ownership, access to water is mediated by broader social relations (Sultana, 2011), therefore, the involvement of *dorbar shnongs* is practicable.

According to an engineer of the Central Groundwater Board in the city, Shillong has a lot of water potential in groundwater.[57] But extracting the water has to be done scientifically which so far has almost never been the case except when the PHED drills the borewells in various parts of the city. Varady, Zuniga-Teran, Gerlak and Megdal (2016) rightly argue that effective groundwater governance requires availability and access to information and science.

It is in this context that water should be recognised as a common-pool resource (Srinivasan and Kulkarni 2014) and the traditional institutions in Shillong have already this understanding about water. Even before the government officially banned groundwater extraction, many *dorbar shnongs* in the city have done it. But groundwater is very complicated to track or regulate, and current local institutions are poorly equipped for this task. The restriction itself was a welcomed move by restricting groundwater to remain open access. But hundreds of borewells have already been drilled

[56] Interview held with Fabian Lyngdoh, former Chairman of the KHADC on 11th March 2016.
[57] Interviewed on 22nd March 2016.

in the non-municipal areas before the restriction was passed. It is this very nature of water extraction that "worsens inequity" (Srinivasan and Kulkarni 2014) because it is being commercialized. Such practice no doubt alleviates water scarcity but also goes against the wishes of the majority. In an interview with Toki Blah, a prominent public figure and former bureaucrat, he asserted the view of many who oppose the sale of water. According to him, there is no justification of selling water.[58]

The groundwater managed by Lawsohtun *Dorbar Shnong* and Nongkhryiem *Dorbar Shnong* is commendable, since the water is shared equitably among the households. Water fees are similar and low. In Nongkhryiem and Lawsohtun there is a shared dependence on water as a critical natural resource and it provides an incentive for "cooperation, collective action and community building even in contexts of conflict and contested property rights" (Tucker, 2014). But in the case of Mawlai and Mawdatbaki the groundwater here is not freely shared but sold by private borewell owners.

For groundwater governance to be effective, bottom-up local institutions must enforce top-down rules. However, the likelihood and success of collective action around groundwater has been found to be influence by several factors, including a shared understanding of the problem, the nature and extent of the aquifer, the level of dependence on the aquifer for livelihoods (Srinivasan and Kulkarni 2014). The property regime of the ground water itself is complex as it is neither common property, because it lacks an identifiable group of individuals having equal user rights, nor genuine open access, because the ability to access groundwater is limited by well ownership (Ananda, 2009). The rule giving near absolute right to landowners to exploit groundwater started during the colonial period and continues till today (Koonan, 2016). So far, in India there is no law that explicitly defines groundwater ownership (Wate, 2012).

[58] Interviewed on 18th August 2016.

There are many conflicts in the use of ground water in many cities throughout the country (Rathore, Ratna Reddy and Ramanathan, 1994) but this study has revealed no cases of such clashes in Shillong city. But the dominant question that arises from this issue of groundwater is that: 'what if this water is distributed equally to all who need for free or for a minimal price?' It falls beyond the scope of this study to provide a befitting answer this question. Instead it posits that, if the *dorbar shnongs* were given responsibility to manage groundwater, the recurrent inequitable distribution of water in Shillong can be reduced.

For instance, in Lawsohtun and Nongkhryiem, there are two main sources of water – surface water (rivers and springs) and groundwater. The *dorbar shnongs* of these localities govern groundwater autonomously with technical assistance from the PHED and they do it proficiently. It must also be noted that the water supplied by the PHED in Lawsohtun and Nongkhryiem is underground water. The PHE Department has used a number of borewells in supplying water. The main hurdle that remains is the regulation of private water vendors in terms of pricing and volume of extraction. Groundwater therefore has to be protected with strict laws.

According to the Meghalaya Water Policy 2011 (draft), exploitation of ground water resources should be so regulated as not to exceed the recharging possibilities, as also to ensure social equity. There should be a periodical reassessment of the ground water potential on a scientific basis, taking into consideration the quality of the water available and economic viability of its extraction. The ground water in Meghalaya is still not over exploited as a whole; however ground water stress is building up in urban areas in view of the rate at which ground water extraction for domestic purposes is taking place. Shillong has not yet been identified as a "notify area" by the Central Ground Water Board (CGWB). But the government has rightly put a restriction for the

unauthorized drilling of borewells in Shillong. And for this to succeed, involvement and cooperation of the *dorbar shnongs* is needed.

According to the CGWB, the way of construction of deep borewells in Shillong is being done in a very unplanned and erratic fashion with concentration of borewells in commercial areas and plush colonies. Groundwater development in Shillong urban area is exceeding 50%. The overuse of ground water resources in various parts of the State especially in Shillong city is posing a huge threat to the availability of fresh water in this part of the country. Many rich individuals on their own are drilling deep tubes in their residential premises without bothering to take necessary permission.[59]

5.5.4 The *Dorbar Shnongs* and its Criticisms

Tucker (2014) maintains that struggles over access to natural resources are associated with resource degradation and institutional failures. Taking this in point, the water governance in Shillong involves a hybrid kind and blaming only the *dorbar shnongs* for failure is inappropriate. But criticisms against these institutions points to their general and specific shortcomings that contribute to 'bad' water governance.

As discussed earlier, one drawback of the *dorbar shnongs* are their unwillingness to be under or merge with the municipal authority. In some sense this might be the case since water supply is much better in the municipal area. The general perception is that—had the municipal area expanded in size i.e., the inclusion of more localities under its ambit, water supply might have improved drastically.

The main argument for this inference, besides the obvious finding drawn by comparing the two divisions (municipal and non-municipal), is that Shillong gets a lot of funding for municipal development and most of it is either unutilized or spent hastily and

[59] See 'Fighting for the last drop', *The Shillong Times*, March 5, 2013 (Accessed 18 December 2015).

carelessly. One could say that the funding is too much for a small municipality. It could be utilized for a much larger area. This is a major criticism against the *dorbar shnongs*. On the flip side of the argument these *dorbar shnongs* are applauded for protecting cultural identity against unwanted government influence thus staying free and retaining traditional authority in the city. The existence of this duality makes the water issue all the more complicated.

An institution is democratic to the degree it is accountable to society. Elections are one of the most common means for establishing downward accountability of local authorities. There is some evidence that elected local authorities can improve natural resource management (Ribot, 2004). However elections to these institutions are far from perfect. Earlier only men were allowed to vote (by voice). But in September 2017, elections were held in Malki using secret ballot; all were allowed to vote including women. Gradually, the *dorbar shnongs* is evolving by instilling inclusiveness and flexibility into its structure and functioning through democratic institution. The degree of accountability and transparency as indicators of good governance, vary from one *dorbar shnong* to another. Not only in terms of these two elements do they differ, but also in a whole range of other issues and characteristics.

City cultural resilience, by the maintenance of these traditional institutions, can be enhanced and sustained and it will increasingly be intertwined with the rise of "citizen-driven collaborations" (Duxbury, 2014). One major hurdle is the inclusion of non-tribals into these institutions. Non-tribal population is increasing in the city. Social sustainability is achieved in cities when diversity and respect go hand in hand (Pareja-Eastaway, Elsinga, O'Mahony, Eng, Wachter and Lovell, 2012). But this is not easy, according to a former headman; non-tribals can never be genuine constituents of any *dorbar shnong* because they, being non-Khasi, can never understand the concept of

dorbar shnong.[60] So solutions are required because water problems and other challenges require a shared understanding and commitment in order to address them (Perry and Atherton, 2107) and the well being of the city itself depends on local structures which in turn rely on "horizontal ties" and "shared interests" (Rusca and Schwartz, 2014).

It is not uncommon to see that there are contestations in support and renunciation of the *dorbar shnongs* in local media. Patricia Mukhim, editor of *The Shillong Times*, (see Mukhim, 2012), writes that the *dorbar shnong* seem to suffer from some deep fear psychosis that they would rather remain stagnant than opt for change which is for the melioration of the city of Shillong. She was indicating the refusal of these institutions to support the holding of elections to the municipality. She blames these "defunct institutions" for the present crisis of civic management. Of course there are others on the other side who want to see change while keeping traditions intact. Another major criticism against the *dorbar shnongs* is their relevance at present in the urban arena. They are considered rigid and staunch in their willingness to adapt. They are basically village councils in an urban setting. Institutions associated with the management of natural resources need to be adaptive because of the inherent complexity of natural systems (Pagan, 2009).

The dominant criticism today against these traditional institutions is the exclusion of women from these institutions (Nongbri, 2000).[61] There is an old saying among Khasis: '*Ynda kynih ka 'iar kynthei, la wai ka pyrthei*' or 'When the hen crows the world is coming to an end.' It is taken to mean that if women take part in politics, the world is doomed (Lalkima, 2009). But things have change over the past few years. From this study, it has been found that there are some *dorbar shnongs* in the city where women can also participate in 'decision making'. Seemingly, such radical changes start in the urban

[60] Interview with a former *rangbah shnong* of Umsohsun, dated 4th March, 2016.
[61] The historical context regarding the *dorbar shnongs* and women is detail in Chapter 3.

areas like Shillong and will slowly spread towards the rural. Also in Nongrim Hills, Laitumkhrah and Lachumiere, women have entered the village *dorbar* as elected/nominated members (Jyrwa, 2006). Still there is much that needs to be dealt with.

5.5.5 Water Future and the Village Councils

Major challenges exist in governance in modern society since the scale of interaction among people is much larger today. The future will likely bring with it new water-related problems due to rapid environmental and technological change (Andries and Janssen, 2013) to Shillong. The challenge of securing equitable access to water is enormous. The nature of water and the multiple roles of actors involved in extraction, use and distribution produce challenges to collective action (Bakker, 2010). Also, water circulation is dependent upon institutions and practices because it is not only socially produced, but also socially enacted (Bakker, 2003a). We argue that institutional arrangements that can promote equity can be made possible with the *dorbar shnongs*.

Dorbar shnongs can be institutions that play a role for the improvement of water management. Such institutions matter for providing good-quality water in adequate quantity to urban to reduce poverty and increase social welfare (Venkatachalam, 2015). Criticism and support for these institutions have their advantages and limitations. However, both these will play an immense role in shaping the water future in Shillong. For a better urban prospect in terms of domestic water, it is imperative that Shillong formulates its own specific strategy based on its "special conditions, requirements, expectations and capabilities" (Biswas and Tortajada, 2010a). Hence in the present context of Shillong, the traditional institutions are essential constituents in urban water governance.

As argued by Linton (2010), "water is what we make of it"; what water will become to the citizens or community will severely depend on how it is influenced and transformed as it flows through the hydrosocial cycle. And in this cycle, the *dorbar shnongs* play a significant part. As a relational substance water will be constituted by many relationships among these and other institutions (Ioris, 2016).

In the section below, let us look at some of possibilities drawn from the study after examining these institutions.

1) First, enforcement of rules is almost always the weakest link in any system for managing water (Richter, 2014). But in Lawsohtun and Nongkhryiem the will to enforce rules is present with noticeable results. Moreover peer pressure and social norms and morals present in the *dorbar shnongs* can be much more powerful and effective than any formal law. Ostrom's primary conclusion in her work *Governing the Commons: The Evolution of Institutions for Collective Action* (1990), that key management decisions should be made as close to the scene of events and the actors involved as possible to avert a tragedy of the commons situation for common pool resources (Richter, 2014).
2) Second, the adherence of different *dorbar shnongs* to governance principles of transparency, accountability and participation, based on core values of honesty, equity and professionalism varies. "Water integrity" in Lawsohtun and Nongkhryiem is high whereas in Nongrah it is low.[62] Such efficacious effort can be advocated and advanced in *dorbar shnong* practices.
3) "Egoism in the city" (Moroni, 2018) is prevalent and curbing self-interest and putting greater emphasis on altruistic motivations in members of each *dorbar shnong* is likely to produce desired water-related outcomes. Caring is one of the

[62] For details on "Water integrity", see Tropp, Jiménez and Le Deunff (2017).

most important yet most devalued values today which has reduced human beings to greed and competition, and transformed everything, including water, into a commodity. Again, the *dorbar shnongs* of Lawsohtun and Nongkhryiem have exhibited concern and regard to water management. Caring must move to center stage as a value to avoid future problems like social disintegration and conflict (Shiva, 2014).

4) Lastly, leaders of these institutions serves as bridging actors influencing the way in which knowledge and learning is exchanged (Horning, Bauer and Cohen, 2016) with the government and other institutions. Exchange of information of many forms takes place between PHED/SMB and the *dorbar shnongs*. More importantly, in the context of this study, will be the knowledge sharing among these institutions thus shaping the social network.

5.5.6 Are Water Supply Systems in Shillong Socially Sustainable?

The most significant question that remains to be asked is "are the water supply systems in Shillong socially sustainable?" This question can be effectively and conclusively answered in two parts: the first part attempts to answer the question of water equity in the localities of Shillong. The second part deals with water governance carried out by the selected *dorbar shnongs*.

Social sustainability has been divided in three parts - development, bridge and maintenance social sustainability (Vallance, Perkins, and Dixon 2011;Wolbring and Rybchinski, 2013; Eizenberg and Jabareen, 2017). Drawing cues from this theoretical framework, development social sustainability was examined in the form of meeting the basic need of water and the creation of (in)equity; bridge sustainability was understood by looking at the way the *dorbar shnongs* perform in (dis)satisfying water requirements;

and maintenance social sustainability was familiarized by examining the present stance, characteristics and performance of the *dorbar shnongs* in the in the urban scene in present time.

The study compared the water supply systems of both municipal and non-municipal localities. While doing so, we also see significant differences even among localities within the same area. Surprisingly, there are even water supply differences within a locality.

The subjective responses of respondents show a mixture of impressions. Though the study does not explicitly connect the relationship between water and well-being, it can be inferred that water supply doles out varying influences on lives of the consumers. More specifically it affects the other criteria or indicators of social sustainability like security, livelihood, education, health, housing, pride and sense of place, hope, and so on.

Social sustainability must accommodate growth from within and adaptation to changes from without and must make things better for people (Aucamp, Woodborne, Perold, Bron and Aucamp, 2011). The second part concerning water governance, again, confirms that mechanisms of and reasons for water governance are the not the same for the *dorbar shnongs* examined in the study. We do not generalize the same conclusions for the city. The governance of these institutions closely affects the nature of water distribution and at times *dorbar shnongs* do not have opportunities to influence change. But this does not mean, for the latter case, that they have no governance roles to play. They all do, in some way or another.

As a criterion of the social pillar of sustainability, (water) governance is not uniform for reasons like lack of accountability and participation. Its impact on water supply is clearly seen from the differences of water quantity distributed in each locality.

It has caused and impacted the hydrosocial relations and forms of social life the people experience (Perreault, 2014). We have also seen that inequitable distribution of water has given rise to "bricolage economies of water" that are comprised of multiple and complex combination of different forms of production and distribution of water (Sharma and Harvey, 2015). In such a case none of the *dorbar shnongs* have taken any steps either to check or to supervise. Perhaps they dare not tread on private territory.

Cities have the potential to move towards sustainability pathways, especially given good urban governance (Rogers et al., 2012). Despite the challenges, it is important to recognize that like other cities, Shillong has that potential. We again ask the questions afresh that "what kind of equity and what kind of water governance?" Simply put, answers for each and every locality will be different in both time and space. Assessing the primary data, it may be succinctly responded that because of the different observations in terms of equity and water governance, social sustainability cannot be easily determined. As separate criteria, we can say there water distribution is highly inequitable in Shillong and the kind of governance delivered by the local traditional institutions (*dorbar shnongs*) is too complicated to theorize for the city as a whole. Nevertheless, social sustainability as a process (Dillard, Dujon and King, 2008) has been examined and partially understood from the lens of water equity and governance. Both procedural and substantive aspects of social sustainability (Boström, 2012) have been investigated in the study further confirming the complex relationship between water and people (Linton, 2011), of Shillong as "a city" (Button, 2002) and of social sustainability as "a concept" (Yung and Chan, 2012).

The next chapter will summarize the study thematically and provide the limitations of the study, likely significance and future scope of the study.

CHAPTER 6

SUMMARY AND CONCLUSION

This chapter summarizes and collates the findings of the study and sum up thematically. The study concerns with social aspects of sustainable development. It attempted to understand social sustainability by examining the water supply systems in the city of Shillong. The focus was water equity in terms of domestic water supply system and water governance carried out by the local traditional institutions. Viewing the sustainability of water supply development through the lens of water governance provides an appropriate context for analyzing the water supply systems which can further contribute to strategies for achieving sustainability. To answer the question of as to whether the water supply system in Shillong is socially sustainable or not or how socially sustainable it is, we shall briefly look at the findings concerning the two criteria of social sustainability, i.e. equity and governance. This chapter also includes the likely significance of the study, limitations of the study and future scope of the study.

6.1 Water Equity in Shillong

In most municipality localities, it can be said that water is equitably distributed. There are exceptions where there is intermittent supply during particular periods, differences in the daily duration of supply, etc. Overall, water equity in the municipality localities is better than that in the non-municipality localities. In most non-municipality localities, water is not equitably distributed. Yet in non-municipality localities there are stand-out exceptions like Lawsohtun and Nongkhryiem. Equitable distribution exists in these two localities but it does not imply that water is enough to meet daily requirement.

So, considering equity from a bird's eye view of Shillong city as a whole, it can be argue that the central part of the city governed by the SMB received a near equitable distribution of water. Here in this study, equity standards are determined by the amount of acceptable quality of water easily accessible for personal and domestic purposes. As one moves away from the municipal governed area, a great extent of water inequity is witnessed. A comparison of the localities (both the municipal and non-municipal areas) shows the water supply system as a whole in the city is in disarray.

Taking the city as a whole, the current system of water supply has failed in various fronts. There is much inequity in access to water and the current water supply situation is insufficient even to those having piped water supply. Most of the poor are excluded from the water network and those with piped connections still get insufficient and irregular water. Revenue does not cover operating and maintenance costs. Households who do not receive water through piped on premises or public standpipes encounter costs in getting water from other sources.

The survey data reveals that water supply system is uneven. In some localities the water supply is twenty-four hours daily whereas in some it is less than thirty minutes in a day. There are localities where water is not supplied on a daily basis. What emerged from the study is that there is a vast difference between the areas under the SMB and non-SMB in terms of the number of hours of water supplied. For instance, households within the municipal area get more water, more regularly and better quality than those outside the municipal administrative area. But there are exceptions in the two areas. In the municipal area most households have piped water on premises. However, outside the municipal area the percentage of households having piped water on premises is lower. Public standpipes are also an important means to get water in the non-municipal area. Other sources include wells, tube wells, water vendors and springs. But even in these two

areas water supply is not homogeneous. The nature of water supply and access depends heavily on the formal and informal institutions. The informal traditional local institutions, i.e. the *dorbar shnongs* have different measures of influencing water distribution and roles for water management.

6.2 Water Governance and the *Dorbar Shnongs*

As underlined in Chapter 5, the kind of governance and much of the effectiveness and efficiency of the same depends on the individual character and nature of the *dorbar shnongs* themselves. Their structure, elections, makeup, location, attitude of leaders, educational level of office bearers, participation, connection with outside organizations, etc. determine whether the *dorbar shnong's* governance is good, bad or somewhere in between. This overall governance is translated into the nature of water governance we locate. It has been established that (in)action of the particular *dorbar shnong* produces different outcomes. In localities outside the municipal jurisdiction and with water sources within their territories differ in the degree of how they govern their waters. Lawsohtun with its ideal water governance is a glaring example of the possibility of supplying water—a basic need, to its residents.

Ostrom (1990) reviewed the manifold examples of small, locally organized governance systems around the world that have managed resources sustainably, often for several hundreds of years. She consistently establishes that sustainability is possible and that sustainable management of local resources is often built with bottom-up processes that emphasize social connections and local control rather than large, centralized institutions (see Seyle and King, 2014). In a similar way, we have seen the success cases of Nongkhryiem and Lawsohtun localities where their dorbar shnongs efficiently distribute water to their residents. Another strong suit of these particular *dorbar shnongs*

is that they have become a part of the "nested enterprises" (Ostrom, 1990) comprising the urban local body (the SMB) and the government (the PHED). Such collaborations are indispensable for bottom-up decision-making and other governance activities like conflict resolution.

The study has established that the *dorbar shnongs* play a significant role in augmenting water supply in some localities in the city. But the future of these traditional institutions is alarming in two ways – first, the cultural identity of the Khasi people which is linked to these institutions are under constant threat; and second, urbanization is influencing the disintegration of the inherent social capital of the traditional institutions. These traditional institutions have also been criticized for their inaction and irrelevance in the modern and urban arena.

The adherence of different *dorbar shnongs* to governance principles of transparency, accountability and participation, based on core values of honesty, equity and professionalism varies. As has been discussed, it is oberved that "water integrity" (Tropp, Jiménez and Le Deunff, 2017) in Lawsohtun is high whereas in Nongrah it is low. One key inference of the study is that the communities in an urban setting, by means of the traditional institutions can effectively govern the common-pool resource of water. The main argument here is that these local institutions are important and necessary for a desired water future prospect. Localities where these institutions practice good water governance witness equitable provision of water. Another important observation is that the social network is strong in these institutions. This inherent traits embedded in these institutions is a major reason for effectiveness in water service delivery. Whereas in other institutions, social capital is dwindling or dormant. Successful cases show that these traditional institutions can evolve themselves and adapt in urban space while preserving their cultural distinctiveness.

Apparently, most *dorbar shnongs* in localities like that of Mawpat seem disinterested and the political will from the top i.e. the government authorities seem to be lacking. Fact of matter is that the governance of water supply will greatly depend on the efficiency of such local traditional institutions. The local institutions in the city are indispensable to meet the rising water demands. Notably the present local traditional institutions in Shillong seem weak, disconnected and vulnerable to the onslaughts of urbanization and modernization. As a result, many *dorbar shnongs* do not exhibit good water governance practices.

The study also observes that currently there is no definite power accorded to the *dorbar shnongs*. The distribution of power and authority is ambiguous. People have a lot of respect for these traditional institutions (*dorbar shnongs*) yet their role is not clearly defined. The prospective actions of the *dorbar shnongs* can includes providing assistance in rainwater harvesting, water quality testing, renovation, water conservation and disseminating water related information to the people, besides others.

According to the Meghalaya State Water Policy 2013 (draft) water is to be "used efficiently, shared equitably, managed sustainably, and governed transparently" and should contribute to improving the health and livelihoods of all citizens. The *dorbar shnongs* shoulder a great responsibility and play a pivotal role to achieve this gaol. Sustainable water governance helps in achieving water sustainability and particularly water equity (Kuzdas et al., 2014). So far, Lawsohtun and Nongkhryiem *Dorbar Shnongs* have proven themselves in achieving this.

6.3 Reaching for Social Sustainability

Provision of the basic human need of water sets a foundation where all people have the opportunity to live a safe, healthy and fulfilling life. As such, it is suggested that

fulfillment of this basic human needs must be seen not only as a fundamental tenet of social sustainability, but as a prerequisite for sustainable development itself (Cuthill M, 2010). Sustainability can be the answer to the exhausting and devastating way societies are predominantly using social and ecological resources, in contemporary times (in't Veld, 2013).

Water connects people (Ait-Kadi, 2016) and so is the case with the people of Shillong. Water is indispensible to community prosperity and in flourishing social fabric (Vörösmarty, Hoekstra, Bunn, Conway and Gupta, 2015). In a sense, urban sustainability is concerned with water being distributed in a just and equitable manner (Rusca and Schwartz, 2014) and this can be achieved through local initiatives—directed by the local institutions like *dorbar shnongs* in the context of Shillong.

What is evident throughout this study is that "analytical clarity on the dimensions of the social aspect of sustainability, our understanding of what that means … will evolve, as will our measures and strategies" (Dillard, Dujon and King, 2008). We concur with this statement; therefore aiming for social sustainability is a social process and not an unchanging goal.

In the preceding chapters, we have seen the multiple criteria and principles advocated in the social sustainability literature. And one of the relative criteria of social sustainability is its dependence on the cultural, political, social and economic context (Glaser and Diele, 2004) and such factors are equally prevailing in the city of Shillong and the Meghalaya state. There is an interdependent and reinforcing interrelationship between different features of social sustainability. Social sustainability requires social sustainability, tautologically speaking (Boström, Vifell, Klintman, Soneryd, Hallström and Thedvall, 2015). To put in it simple words, the kind of social sustainability that subsists in Shillong will determine the social sustainability of the future. The study has

partly answered the central question—what kind of equity and what kind of water governance are existent in Shillong.

The survey for this study contains a section where respondents are asked to provide their remarks or opinions regarding water supply. They were also asked to recommend water related approaches and changes they would like to see in the near future. Some of the common responses evident in the survey are listed below:

1. That there should be an increase in the quantity of water supplied.
2. That wastage of water has to be checked by repairing water pipes regularly.
3. That protection of catchment areas, particularly the forests, must be a priority to ensure a sustainable supply of water.
4. That quality must be improved by initiating measures like cleaning of main water tanks regularly. The SMB and PHED are known for their infamous inactivity of not keeping water tanks cleaned at regular intervals. Also, water pipes should be properly channelized and should not run through drains.
5. That there should be house water connections available for all households and an increase in the number of public standpipes.
6. That the price of water provided through water vendors should decrease or reasonable.
7. That *dorbar shnongs* should take up more responsibility in resolving water associated problems.

The current situations of water supply system in Shillong are being questioned because of shifts and differences in water availability. The lack of water accessibility has

raised questions about the governance of water and the people concern. The growing commodification and commercialization of water in Shillong will make water governance more complicated. Also, the implementation of the Greater Shillong Water Supply Scheme (Phase III) faces a threat of further delay with hurdles remaining and no tentative deadline has been fixed for its completion.[63] All these and many other varied, related, imminent and present challenges demand changes of all sizes. For example, there is a need to create a Meghalaya Ground Water Authority[64] to check and preserve underground water. The State's Springshed Management Initiative was launched in 2015 to map and protect the springs which are a major source of water for the city and state as a whole.[65] The *dorbar shnongs* are getting involved in the much larger water-livelihoods programme in process.[66] It is crucial that these practices are acknowledged by local management structures so as to avoid disturbance of the socio-cultural fabric of these communities.

In recent years, water has become a commodity in many parts of Shillong. According to Bakker (2009), although water markets can help in sustaining urban water systems, yet one has to be cautious of poor governance as it can lead to the emergence of cartels and water mafias (Amir, 2015). Additionally, there is something emotive in the nature of water, in the idea of water, which militates against it being owned and controlled for profit (Coopey and Tvedt, 2006). Such perception is deeply interwoven in the minds of Shillong's denizens and has to be sagasciously managed.

[63] See 'Hurdles Galore In Water Scheme Implementation', *The Shillong Times*, Jan. 18, 2018 (Accessed on May 12, 2018).
[64] The Shillong Water Declaration, http://www.focusglobalreporter.org/the-shillong-water-conclave-water-equity-sustainability-in-the-context-of-north-east-india/ (Accessed on May 4, 2017).
[65] See http://www.indiawaterportal.org/articles/indias-largest-springs-mapping-exercise-begins-meghalaya (Accessed on June 17, 2017).
[66] Ibid

Though the *dorbar shong* is a dominant local institution within the city, it evolved along with two other – partly overlapping and competing with the administrative structures of the KHADC and the state bureaucracy. This has only led to a state of affairs that is highly complex and confusing. There have been a mixed responses and opinions concerning the position of the *dorbar shnong* today. On the one hand, for the tribal ideologues – the concept of *dorbar shnong* is a celebrated form of grassroots democracy; and on the other hand, these institutions are an exclusivist and ineffective form of rule that should end (Karlsson, 2017). There is also a strong opinion that the negative aspects of the traditional institution like the reservation of executive functions within the council to persons from selected clans only must be abandoned (see Gowloog, 2009). In a sense, tradition should not curtail openness (Landry, 2006) but at the same time accommodate the wind of change. Moreover, many have voiced their concern that the Khasi communities have lost knowledge about their cultural and traditional practices and many have abandoned them in favour of modern ways of living.

The question of 'who', 'why' and 'how' shapes the content and targets of equity in governance interventions. Strategies for the future must inevitably question existing power relations that lead to multi-scalar re-arrangements in existing hydrosocial networks (Hoogesteger and Wester, 2015). Water efficiency and reduction of water losses must be prioritised and all water should be accounted for. Improving accessibility and governance will ensure water security (Biggs, Duncan, Atkinson and Dash, 2013).

Institutions and institutional change determine development (Booth, 2013). Poor governance and weak institutions are impediments to urban prosperity (UN-Habitat, 2013). The traditional institutions can build capacity to create a cadre of water managers (Amir, 2015) where participatory procedures can influence social learning (Boström, Vifell, Klintman, Soneryd, Hallström and Thedvall, 2015). *Dorbar shnongs* have the

prospective to become spaces where social innovation takes place, where people find them to be enabling environments. New interdependencies among actors, network society of the future (Castells, 1996; Arsenault, 2011) and "e-participation" (He, Boas, Mol and Lu, 2017) may lead to *e-dorbar shnong* which may possibly essentialise the future water problems and challenges confronting the city of Shillong.

Based on the findings of the study, deregulation of water supply is recommended.[67] For instance, one can postulate that if more power is bestowed in the hands of the *dorbars shnongs*, there is a possibility to distribute water more efficiently in a transparent and responsible manner. And in order to achieve this, a uniform set of rules and guidelines from the government bodies like the KHADC and the *dorbar shnongs* themselves must be in a position to deliver good water governance that could bring about water equity. Additionally, all the water supply providers should be subject to regulatory frameworks with clear standards which should be implemented for water supply systems—whether public or private (Bakker, Kooy, Shofiani and Martijn, 2008). Guidelines enshrined with that of the *dorbar shnongs* bodies must regulate the roles of actor-participants.

For a more equitable redistribution system institutionalization of community participation mechanisms is desirable. Also, water infrastructure can be properly maintained and water resources would be more effectively managed and water supply is demand-oriented approach (Zérah, Janakarajan and Llorente, 2011). In the case of Shillong, institutionalization already exists in the form of the traditional institutions (*dorbar shnongs*) and that is an advantage. However, what is lacking in most parts of the city is participation.

[67] The literal meaning of *deregulation* connotes that it is the process of removing or reducing state regulations, typically in the economic sphere. It is the repeal of governmental regulation of the economy.

This study has examined that—how an institution affects the course of water supply system? Besides it is equally important to understand how water shapes the structure and the transformation of these institutions. A closer attention to understand the full array of users within and across communities is indispensable, because needs, values, attitudes and governance can change considerably among users—and such things matters when one tries to understand water inequities (Lu, Ocampo-Raeder and Crow, 2014). A strong social sustainability therefore requires social capital, which is critical and irreplaceable, and occupies an important framework in urban water governance (see Lehtonen, 2004). By and large, culture is a vital and essential aspect of the social capital of the people of the Shillong region which determines how water as a natural resource can best be used to meet current and future social needs (Miller, 2017).

While keeping social sustainability as important bedrock within urban water governance, the *dorbar shnongs* must engage in "multilevel governance" and "adaptive governance" (Termeer, Dewulf and Lieshout, 2010); and in hydrosocial renewal by placing people at the center of water solutions (Linton, 2014). As localities are usually small areas and governance is workable within the means of human capital. But since they do not have the wherewithal, *dorbar shnongs* will have to work for a water governance regime that is supportive to the interdependence of all institutions. A nurturing a complementary relationship between formal and informal institutions is required for sustainability transformation (Pahl-Wostl, Gupta, Lebel, Schulze and Stuart-Hill, 2015).

Water governance cannot remains a piecemeal and ad hoc set of activities but rather it should focus on necessary change in the power relationships that determine [positive] outcomes (Plummer and Slaymaker, 2017). Hence, water development

initiatives have to work with the local fabric and to have effective policy (see Rusca and Schwartz, 2014).

As evident from the study, the *dorbar shnongs* are institutions are intrinsic to the Khasi tribal society. Their role as custodians of the people in this globalizing era has to be progressive. Karlsson (2005) argues that such institutions of the [Khasi] people require strengthening and to be entrusted with specific roles and opportunities. To make this happen there is a need to review the Sixth Schedule or at least some of its provisions.[68] Though the revival of traditional institutions is complex (Karlsson, 2005) it is both significant and urgent that the *dorbar shnongs* accommodate change (Gowloog, 2009). Even the ones that operate comparably better require to evolve and reform their structure as well as practices. At present, some *dorbar shnongs* may be functioning well and strong but they are not on an equal footing in terms of their control, influence, contribution and recognition as a whole.

It is worthwhile to recall Gandhi's idea of self-rule or *swaraj* here. Gandhi believes in the idea of self-governance through individuals and community building (Singh, 2016). Emulating such approach can become a strength as well as an opportunity for the *dorbar shnongs* to expand on in the context of Shillong. Despite accepting the fact that maximizing self-governance is critical to empowering people, it is also equally imperative to strengthen these local institutions. In other words, managing the water commons for the common good is a creative attempt of good governance practices (Dargantes, Manahan, Moss and Suresh, 2012).

As posited by Carley and Smith (2001) mobilization of human creativity is the real task of sustainable development; in the same vein *dorbar shnongs* provide the avenue for such creativity that can lead to sustainable water solutions. Findings of the

[68] For more details on Sixth Schedule in Northeast India, see Søreide (2013).

study underscored that Government alone—working on its own will never resolve the challenges of sustainable development (Carley, 2001). Despite their limitations, *dorbar shnongs* are the institutions that are closest to the people and the people concern can conversely become interested in their own affairs and steer their future. Therefore, local traditional institutions in the city are indispensable to such demands and challenges.

In order to encounter the future challenges, it is important to tease out the social capital inherent in the institutions of the *dorbar shnongs*. Social networks will help underpin the informal governance (Rogers, 2006) such as the *dorbar shnongs*. As an institution that remains closest to the majority of the people in the city, "social learning" (Casadevall, 2016; Bakker and Morinville, 2013) is accessible and feasible. Even "moral distances" (Park, 1915) can be bridged in the communities via the water governance practised by these institutions. *Dorbar shnongs* are "action arenas" (Anderies and Janssen, 2013) where the water future of Shillong and the surrounding areas will be vastly influenced.

Equitable water supply through robust and effective water governance with more effective institutions is urgent for the Shillong city as a whole. As an essential part of the transition to sustainability (Rogers et al., 2012), equity must be rightly framed (McDermott, Mahanty and Schreckenberg, 2013). Of the three pillars of sustainable development, perhaps the most difficult to comprehend is social sustainability. Social sustainability "emphasizes the creation of a high quality of life for all by ensuring that the benefits of development are shared equally by everyone" (Dudley, 2010). And to attain this water user must be involved in planning processes and in the operation and maintenance of small scale and standpipe supplies.

While Shillong city belongs to its every 'cityzen', the question is – How these traditional institutions will accommodate everyone is easier said than done. Since

dorbar shnongs as institutions are formed through "the uneven patching together of old practices and norms with new arrangements", it requires the reinvention of tradition, the recognition and identification of legitimate forms of authority and the fostering of mutual cooperation and respect (Cleaver, 2001).

This study took an approach of attempting to understand one pillar of sustainable development. But all the pillars seem interconnected. So reaching for "water equity" and "good water governance" has to include and consider all components of sustainability. According to renowned social activist in Meghalaya K. Pyrtuh (2015), governance is not just for people but also for the good and welfare of the whole system including economy and environment. Correspondingly, Falkenmark (1999) opines that if we protect the integrity of the water cycle, protection of water quality and supply can be ensured. People in the city of Shillong have generally been taking water for granted (Sahu, 2005).

If we relook the Sustainable Development Goal (SDG) 6.1 – it emphasizes to achieve universal and equitable access to safe and affordable drinking water for all proportion of population by 2030 using safely managed drinking water services and to support and strengthen the participation of local communities in improving water management (UN, 2017). Realizing this particular goal is of paramount importance since water is embedded in almost all the other SDGs (Ait-Kadi, 2016). Local governments and [traditional] institutions may choose to take a leading role on implementing the SDGs within their territories and mandates. These local goals and targets, and the delivery of the goals will depend on [local] governance systems [at the grass root level] (Lucci, 2015, emphasis added).

According to the *State of the World's Cities Report 20012-13* states that sound institutions matter for the prosperity of cities (UN-Habitat, 2013). The PHED, the SMB and the *dorbar shnongs* have equally important roles to play and which will determine

the water security of Shillong's future. The future has to be one where the *dorbar shnongs* will have to be relevant, that is by of which these institutions can play a significant role in avoiding a water future that is fragile.

For Shillong to become a "good city"[69] water equity has to be prioritized and good water governance can ensure that. Local institutions are important for sustainable development. They are important for mobilising resources and regulating their use (Uphoff, 1992; Seyle and King, 2014). The *dorbar shnongs* are part and parcel of Khasi culture. Culture is a vital and essential aspect of the social capital of the people of the. The *dorbar shnongs* have their influence over their residents and the control of water within their territories (Nongkynrih, 2002). In a sense, the future of Shillong is define by how well the region's natural resources is protected and preserved—to meet not just current needs but without compromising with the future [social] needs.

6.4 Likely Significance of the Study

The study has discussed and explained on the issue of water governance rendered by the traditional institutions in the city of Shillong. It has presented a near-holistic view of the domestic water supply scenario of Shillong at present in terms of equity. The two criteria of social sustainability chosen for the research – equity and governance in an urban context have been closely examined and understood through empirical study.

We strongly feel that this thesis can contribute to the overall understanding of social sustainability of Shillong in general and the role of *dorbar shnongs* in water supply systems in particular. Also, it will be helpful for other researchers who will be

[69] Amin (2006) states that a good city is one where there is continual maintenance and repair, is socially just and one which celebrates the aspects of urban life from which spring the hopes and rewards of association and sociality.

interested in doing advance research on this and other related topics. Moreover, the study can help convey better understanding for solutions for a sustainable future.

We are equally optimistic that the study can lead to an "engaged research–practice relationship in catalysing urban transformations" (Perry and Atherton, 2017). This study addresses issues that are significant globally, especially in developing countries where there are urban water supply problems. The study can helps improve practice, for example, to motivate the *dorbar shnongs* to invest on the social capital and build better networks. Also, this study adds to the scholarly research or research literature (i.e. the production of knowledge) relating to social sustainability, common property resource and water governance, besides others. Additionally, as social sustainability is a concept rarely discussed in the water management literature (Hellberg, 2017) the study has in some way added to the gap.

It can also improve water and urban policy of Shillong. The findings from this study can contribute to policies that envision improving overall urban social sustainability and water governance in particular.

Findings of this study can add to the small cities literature, such as the uniqueness of the study area with reference to water and thus reiterating the importance and prevalence of small cities and contributes to global urban sustainability. The finding of this thesis can be juxtaposed with other small cities, hill stations, urban areas of the Northeast, India and the world for further research.

6.5 Limitations of the Study

The present study is limited in terms of the following points:

1. The present study is restricted to few selected localities due to time limitation.

2. Some of the secondary data gathered from governmental agencies are not updated. Moreover, not all relevant data could be acquired because of the unwillingness and apathy of the concerned people. For example, the latest data could not be obtained from the PHED and SMB.
3. The questionnaire survey has limitations of reach.

6.6 Future Scope of Research

This study can be extended in future research and some of the possible directions include:

1. More localities and *dorbar shnongs* can be studied for a more comprehensive understanding. Case study research can unfold more of what the present study has been able to examine and find.
2. Future research focusing on other criteria and indicators of social sustainability is suggested. The many criteria and indicators of social sustainability itself make it imprecise to infer from two criteria alone.
3. Water equity and water governance can still be further examined. For example equity can be understood more holistically by adopting the freedoms and capabilities approach of Amartya Sen (Goff and Crow, 2014).
4. Future research can look further at the waterscape of Shillong by inquiring into "the ways in which flows of water, power and capital converge to produce uneven socioecological arrangements over space and time" (Budds and Hinojosa, 2012).
5. The study can be extended and integrated with various areas of research related to water, water governance, sustainability, etc.

6. From a normative perspective, the study of water in the plural term ‘waters’ (Feitelson, 2012) can unearth more than what the study has. More investments in resources for research can enhance and improve upon the present study besides propounding solutions.
7. Social network analysis of the *dorbar shnongs* and beyond may be worth examining.

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ANNEXURE I

Questionnaire

Name:
Locality/*Dong*:
Household size:
Adult male (in number): Adult female:
Occupation:
Household Type:

1. Is piped water connection/piped water on premises available in your house?

   ☐ YES ☐ NO

   If **YES**, please answer 2, 3, 4 and 5, If **NO**; please answer 6, 7, 8, 9 and 10

2. How many days a week do you get water? .....

3. How many hours per day is water available? .....

4. Does your household also require water from other sources?

   ☐ YES ☐ NO

5. If YES, please tick

   ☐ Public standpipe ☐ Well ☐ Tube well ☐ Buying of water

   ☐ Others (please mention)……

6. What is the source(s) of your household water?

   ☐ Public standpipe ☐ Well ☐ Borewell ☐ Rainwater

   ☐ Springs ☐ Buying of water ☐ Others (please mention)……..

7. How many days a week do you get water? .....

8. How many hours per day is water available? .....

9. What is the walking distance from your house to the water source?

☐ About 5 minutes ☐ About 15 minutes

☐ About 30 minutes ☐ More (please mention) …….

10. Who usually collects the water?

☐ Adult Men ☐ Adult Women ☐ others (please mention)

……

Please answer the rest of the questions.

1. What is your overall satisfaction with the water **quantity**?

☐ very satisfied ☐ satisfied ☐ not satisfied ☐ not at all satisfied

2. Is the water quantity enough to meet daily household water requirements (cooking, bathing, washing, gardening, business-related activities, others)?

☐ YES ☐ NO

3. How would you describe the reliability of the water supply?

☐ Very good ☐ Good ☐ Satisfactory ☐ Bad

4. Are there seasonal water shortages? ☐ YES ☐ NO

a) When do they usually occur? ……

b) How long do they usually last? …….

5. What is your overall satisfaction with the water **quality**?

☐ very satisfied ☐ satisfied ☐ not satisfied ☐ not at all satisfied

6. Do you think water is safe for direct consumption? ☐ YES ☐ NO

7. Do you filter/boil water before drinking? ☐ YES ☐ NO

8. Do you use filters? ☐ YES ☐ NO

9. If YES, what is the cost of procuring, installation of the filter?

……

……

1. Do you pay for your water? ☐ YES ☐ NO ☐ I Don't Know

2. If YES, how much per month/ per year? ……

3. Whom do you contact when there is any problem? (You can tick more than one)

☐ Rangbah Shnong ☐ SMB/PHED ☐ plumbers

☐ Others (please mention)……

4. Do you think there is any kind of favouritism in supply of water to a particular group or a family? ☐ ☐ NO

If YES, why? ……

……

1. Is the Dorbar Shnong of your locality engaged and committed to water supply?

☐ YES ☐ NO

2. Is the Dorbar Shnong responsive to the water needs of your locality?

☐ YES ☐ NO

3. Do you or other members of your family attend Dorbar Shnong meetings?

☐ YES ☐ NO

……

Please mention water related problems/improvements you would like to see happen in the future.

a)

b)

c)

Additional remarks, if any: